

The `minted` package: Highlighted source code in L^AT_EX

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Abstract

`minted` is a package that facilitates expressive syntax highlighting using the powerful `Pygments` library. The package also provides options to customize the highlighted source code output.

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Contents

1	Introduction	4
2	Installation	4
2.1	Prerequisites	4
2.2	Required packages	5
2.3	Installing <code>minted</code>	5
3	Transitioning to version 2	6
4	Basic usage	6
4.1	Preliminary	6
4.2	A minimal complete example	7
4.3	Formatting source code	8
4.4	Using different styles	9
4.5	Supported languages	9
5	Floating listings	9
6	Options	11
6.1	Package options	11
6.2	Macro option usage	15
6.3	Available options	16
7	Defining shortcuts	26
8	FAQ and Troubleshooting	28
	Version History	31
9	Implementation	37
9.1	Required packages	37
9.2	Package options	38
9.3	Input, caching, and temp files	41
9.4	OS interaction	43
9.5	Option processing	45
9.6	Additions to <code>fancyvrb</code>	60
9.6.1	Setup	60

9.6.2	Line breaking	61
9.7	<code>linenos</code>	76
9.8	Cleanup	76
9.9	Internal helpers	76
9.10	Public API	86
9.11	Command shortcuts	91
9.12	Float support	93
9.13	Epilogue	94
9.14	Final cleanup	94
10	Implementation of compatibility package	95

1 Introduction

`minted` is a package that allows formatting source code in L^AT_EX. For example: for compatibility with earlier versionsfor compatibility with earlier versions

```
\begin{minted}{<language>}
<code>
\end{minted}
```

will highlight a piece of code in a chosen language. The appearance can be customized with a number of options and color schemes.

Unlike some other packages, most notably `listings`, `minted` requires the installation of additional software, `Pygments`. This may seem like a disadvantage, but there are also significant advantages.

`Pygments` provides superior syntax highlighting compared to conventional packages. For example, `listings` basically only highlights strings, comments and keywords. `Pygments`, on the other hand, can be completely customized to highlight any kind of token the source language might support. This might include special formatting sequences inside strings, numbers, different kinds of identifiers and exotic constructs such as HTML tags.

Some languages make this especially desirable. Consider the following Ruby code as an extreme, but at the same time typical, example:

```
class Foo
  def init
    pi = Math::PI
    @var = "Pi is approx. #{pi}"
  end
end
```

Here we have four different colors for identifiers (five, if you count keywords) and escapes from inside strings, none of which pose a problem for `Pygments`.

Additionally, installing `Pygments` is actually incredibly easy (see the next section).

2 Installation

2.1 Prerequisites

`Pygments` is written in Python, so make sure that you have Python 2.6 or later installed on your system. This may be easily checked from the command line:

```
$ python --version
Python 2.7.5
```

If you don't have Python installed, you can download it from the [Python website](#) or use your operating system's package manager.

Some Python distributions include **Pygments** (see some of the options under “Alternative Implementations” on the Python site). Otherwise, you will need to install **Pygments** manually. This may be done by installing [setuptools](#), which facilitates the distribution of Python applications. You can then install **Pygments** using the following command:

```
$ sudo easy_install Pygments
```

Under Windows, you will not need the `sudo`, but may need to run the command prompt as administrator. **Pygments** may also be installed with `pip`:

```
$ pip install Pygments
```

If you already have **Pygments** installed, be aware that the latest version is recommended (at least 1.4 or later). Some features, such as `escapeinside`, will only work with 2.0+. `minted` may work with versions as early as 1.2, but there are no guarantees.

2.2 Required packages

`minted` requires that the following packages be available and reasonably up to date on your system. All of these ship with recent \TeX distributions.

- | | | |
|--------------------------|---------------------------|------------------------------|
| • <code>keyval</code> | • <code>calc</code> | • <code>xcolor</code> |
| • <code>kvoptions</code> | • <code>ifplatform</code> | • <code>lineno</code> |
| • <code>fancyvrb</code> | • <code>pdftexcmds</code> | • <code>framed</code> |
| • <code>float</code> | • <code>etoolbox</code> | • <code>shellesc</code> (for |
| • <code>ifthen</code> | • <code>xstring</code> | <code>luatex 0.87+</code>) |

2.3 Installing `minted`

You can probably install `minted` with your \TeX distribution's package manager. Otherwise, or if you want the absolute latest version, you can install it manually by following the directions below.

You may download `minted.sty` from the [project's homepage](#). We have to install the file so that \TeX is able to find it. In order to do that, please refer to the [\$\text{\TeX}\$ FAQ](#). If you just want to experiment with the latest version, you could locate your current `minted.sty` in your \TeX installation and replace it with the latest version. Or you could just put the latest `minted.sty` in the same directory as the file you wish to use it with.

3 Transitioning to version 2

Transitioning from `minted` 1.7 to 2.0+ should require no changes in almost all cases. Version 2 provides the same interface and all of the same features.

In cases when custom code was used to hook into the `minted` internals, it may still be desirable to use the old `minted` 1.7. For those cases, the new package `minted1` is provided. Simply load this before any other package attempts to load `minted`, and you will have the code from 1.7.

A brief summary of new features in version 2.0 is provided below. More detail is available in the [Version History](#).

- New inline command `\mintinline`.
- Support for caching highlighted code with new package option `cache`. This drastically reduces package overhead. Caching is on by default. A cache directory called `_minted-(document name)` will be created in the document root directory. This may be modified with the `cachedir` package option.
- Automatic line breaking for all commands and environments with new option `breaklines`. Many additional options for customizing line breaking.
- Support for Unicode under the pdfTeX engine.
- Set document-wide options using `\setminted{<opts>}`. Set language-specific options using `\setminted[<lang>]{<opts>}`. Similarly, set inline-specific options using `\setmintedinline`.
- Package option `langlinenos`: do line numbering by language.
- Many new options, including `encoding`, `autogobble`, and `escapeinside` (requires Pygments 2.0+).
- New package option `outputdir` provides compatibility with command-line options `-output-directory` and `-aux-directory`.
- New package option `draft` disables Python use to give maximum performance.
- `\mint` can now take code delimited by matched curly braces `{}`.

4 Basic usage

4.1 Preliminary

Since `minted` makes calls to the outside world (that is, `Pygments`), you need to tell the \LaTeX processor about this by passing it the `-shell-escape` option or it won't allow such calls. In effect, instead of calling the processor like this:

```
$ latex input
```

you need to call it like this:

```
$ latex -shell-escape input
```

The same holds for other processors, such as `pdflatex` or `xelatex`.

You should be aware that using `-shell-escape` allows \LaTeX to run potentially arbitrary commands on your system. It is probably best to use `-shell-escape` only when you need it, and to use it only with documents from trusted sources.

Working with OS X

If you are using `minted` with some versions/configurations of OS X, and are using caching with a large number of code blocks (> 256), you may receive an error like

```
OSError: [Errno 24] Too many open files:
```

This is due to the way files are handled by the operating system, combined with the way that caching works. To resolve this, you may use the OS X commands `launchctl limit maxfiles` or `ulimit -n` to increase the number of files that may be used.

4.2 A minimal complete example

The following file `minimal.tex` shows the basic usage of `minted`.

```
\documentclass{article}

\usepackage{minted}

\begin{document}
\begin{minted}{c}
int main() {
    printf("hello, world");
    return 0;
}
\end{minted}
\end{document}
```

By compiling the source file like this:

```
$ pdflatex -shell-escape minimal
```

we end up with the following output in `minimal.pdf`:

```
int main() {
    printf("hello, world");
    return 0;
}
```

4.3 Formatting source code

`minted` Using `minted` is straightforward. For example, to highlight some Python source code we might use the following code snippet (result on the right):

```
\begin{minted}{python}
def boring(args = None):
    pass
\end{minted}

def boring(args = None):
    pass
```

Optionally, the environment accepts a number of options in `key=value` notation, which are described in more detail below.

`\mint` For a single line of source code, you can alternatively use a shorthand notation:

```
\mint{python}|import this|      import this
```

This typesets a single line of code using a command rather than an environment, so it saves a little typing, but its output is equivalent to that of the `minted` environment.

The code is delimited by a pair of identical characters, similar to how `\verb` works. The complete syntax is `\mint[<options>]{<language>}{<delim><code><delim>}`, where the code delimiter can be almost any punctuation character. The *<code>* may also be delimited with matched curly braces {}, so long as *<code>* itself does not contain unmatched curly braces. Again, this command supports a number of options described below.

Note that the `\mint` command **is not for inline use**. Rather, it is a shortcut for `minted` when only a single line of code is present. The `\mintinline` command is provided for inline use.

`\mintinline` Code can be typeset inline:

```
X\mintinline{python}{print(x**2)}X   Xprint(x**2)X
```

The syntax is `\mintinline[<options>]{<language>}{<delim><code><delim>}`. The delimiters can be a pair of characters, as for `\mint`. They can also be a matched pair of curly braces, {}.

The command has been carefully crafted so that in most cases it will function correctly when used inside other commands.¹

¹For example, `\mintinline` works in footnotes! The main exception is when the code

`\inputminted` Finally, there's the `\inputminted` command to read and format whole files. Its syntax is `\inputminted[<options>][<language>]{<filename>}`.

4.4 Using different styles

`\usemintedstyle` Instead of using the default style you may choose another stylesheet provided by Pygments. This may be done via the following:

```
\usemintedstyle{name}
```

The full syntax is `\usemintedstyle[<language>]{<style>}`. The style may be set for the document as a whole (no language specified), or only for a particular language. Note that the style may also be set via `\setminted` and via the optional argument for each command and environment.²

To get a list of all available stylesheets, see the online demo at the [Pygments website](#) or execute the following command on the command line:

```
$ pygmentize -L styles
```

Creating your own styles is also easy. Just follow the instructions provided on the [Pygments website](#).

4.5 Supported languages

Pygments supports over 300 different programming languages, template languages, and other markup languages. To see an exhaustive list of the currently supported languages, use the command

```
$ pygmentize -L lexers
```

5 Floating listings

`listing` `minted` provides the `listing` environment to wrap around a source code block. This puts the code into a floating box. You can also provide a `\caption` and a `\label` for such a listing in the usual way (that is, as for the `table` and `figure` environments):

contains the percent `%` or hash `#` characters, or unmatched curly braces.

²Version 2.0 added the optional language argument and removed the restriction that the command be used in the preamble.

```

\begin{listing}[H]
  \mint{cl}/(car (cons 1 '(2)))/
  \caption{Example of a listing.}
  \label{lst:example}
\end{listing}

```

Listing `\ref{lst:example}` contains an example of a listing.

will yield:

```
(car (cons 1 '(2)))
```

Listing 1: Example of a listing.

Listing 1 contains an example of a listing.

`\listoflistings` The `\listoflistings` macro will insert a list of all (floated) listings in the document:

List of Listings	
<code>\listoflistings</code>	1 Example of a listing. 10

Customizing the `listing` environment

By default, the `listing` environment is created using the `float` package. In that case, the `\listingscaption` and `\listoflistingscaption` macros described below may be used to customize the caption and list of listings. If `minted` is loaded with the `newfloat` option, then the `listing` environment will be created with the more powerful `newfloat` package instead. `newfloat` is part of `caption`, which provides many options for customizing captions.

When `newfloat` is used to create the `listing` environment, customization should be achieved using `newfloat`'s `\SetupFloatingEnvironment` command. For example, the string “Listing” in the caption could be changed to “Program code” using

```
\SetupFloatingEnvironment{listing}{name=Program code}
```

And “List of Listings” could be changed to “List of Program Code” with

```
\SetupFloatingEnvironment{listing}{listname=List of Program Code}
```

Refer to the `newfloat` and `caption` documentation for additional information.

`\listingscaption` (Only applies when package option `newfloat` is not used.) The string “Listing”

in a listing’s caption can be changed. To do this, simply redefine the macro `\listingscaption`, for example:

```
\renewcommand{\listingscaption}{Program code}
```

`\listoflistingscaption` (Only applies when package option `newfloat` is not used.) Likewise, the caption of the listings list, “List of Listings,” can be changed by redefining `\listoflistingscaption`:

```
\renewcommand{\listoflistingscaption}{List of Program Code}
```

6 Options

6.1 Package options

`chapter` To control how \LaTeX counts the `listing` floats, you can pass either the `section` or `chapter` option when loading the `minted` package. For example, the following will cause listings to be counted by chapter:

```
\usepackage[chapter]{minted}
```

`cache=<boolean>` `(default: true)` `minted` works by saving code to a temporary file, highlighting the code via `Pygments` and saving the output to another temporary file, and inputting the output into the \LaTeX document. This process can become quite slow if there are several chunks of code to highlight. To avoid this, the package provides a `cache` option. This is on by default.

The `cache` option creates a directory `_minted-<jobname>` in the document’s root directory (this may be customized with the `cachedir` option).³ Files of highlighted code are stored in this directory, so that the code will not have to be highlighted again in the future. In most cases, caching will significantly speed up document compilation.

Cached files that are no longer in use are automatically deleted.⁴

`cachedir=<directory>` `(def: _minted-<jobname>)` This allows the directory in which cached files are stored to be specified. Paths

³The directory is actually named using a “sanitized” copy of `<jobname>`, in which spaces and asterisks have been replaced by underscores, and double quotation marks have been stripped. If the file name contains spaces, `\jobname` will contain a quote-wrapped name, except under older versions of MiKTeX which used the name with spaces replaced by asterisks. Using a “sanitized” `<jobname>` is simpler than accommodating the various escaping conventions.

⁴This depends on the main auxiliary file not being deleted or becoming corrupted. If that happens, you could simply delete the cache directory and start over.

should use forward spaces, even under Windows.

Special characters must be escaped. For example, `cachedir=~/.mintedcache` would not work because the tilde `~` would be converted into the L^AT_EX commands for a non-breaking space, rather than being treated literally. Instead, use `\string~/.mintedcache`, `\detokenize{~/.mintedcache}`, or an equivalent solution.

Paths may contain spaces, but only if the entire *<directory>* is wrapped in curly braces `{}`, and only if the spaces are quoted. For example,

```
cachedir = {\detokenize{~/ "minted cache" / "with spaces"}}
```

Note that the cache directory is relative to the `outputdir`, if an `outputdir` is specified.

```
finalizcache={boolean}  
(default: false)
```

In some cases, it may be desirable to use `minted` in an environment in which `-shell-escape` is not allowed. A document might be submitted to a publisher or preprint server or used with an online service that does not support `-shell-escape`. This is possible as long as `minted` content does not need to be modified.

Compiling with the `finalizcache` option prepares the cache for use in an environment without `-shell-escape`.⁵ Once this has been done, the `finalizcache` option may be swapped for the `frozenscache` option, which will then use the frozen (static) cache in the future, without needing `-shell-escape`.

```
frozenscache={boolean}  
(default: false)
```

Use a frozen (static) cache created with the `finalizcache` option. When `frozenscache` is on, `-shell-escape` is not needed, and Python and Pygments are not required. In addition, any external files accessed through `\inputminted` are no longer necessary.

This option must be used with care. A document *must* be in final form, as far as `minted` is concerned, *before* `frozenscache` is turned on, and the document *must* have been compiled with `finalizcache`. When this option is on, `minted` content cannot be modified, except by editing the cache files directly. Changing any `minted` settings that require Pygments or Python is not possible. If `minted` content is incorrectly modified after `frozenscache` is turned on, `minted` *cannot* detect the modification.

If you are using `frozenscache`, and want to verify that `minted` settings or content have not been modified in an invalid fashion, you can test the cache using the following procedure.

1. Obtain a copy of the cache used with `frozenscache`.

⁵Ordinarily, cache files are named using an MD5 hash of highlighting settings and highlighted text. `finalizcache` renames cache files using a `listing<number>.pygtex` scheme. This makes it simpler to match up document content and cache files, and is also necessary for the XeTeX engine since prior to TeX Live 2016 it lacked the built-in MD5 capabilities that pdfTeX and LuaTeX have.

2. Compile the document in an environment that supports `-shell-escape`, with `finalizcache=true` and `frozencache=false`. This essentially regenerates the frozen (static) cache.
3. Compare the original cache with the newly generated cache. Under Linux and OS X, you could use `diff`; under Windows, you probably want `fc`. If `minted` content and settings have not been modified in an invalid fashion, all files will be identical (assuming that compatible versions of Pygments are used for both caches).

```
draft=<boolean>
(default: false)
```

This uses `fancyvrb` alone for all typesetting; `Pygments` is not used. This trades syntax highlighting and some other `minted` features for faster compiling. Performance should be essentially the same as using `fancyvrb` directly; no external temporary files are used. Note that if you are not changing much code between compiles, the difference in performance between caching and draft mode may be minimal. Also note that `draft` settings are typically inherited from the document class.

Draft mode does not support `autogobble`. Regular `gobble`, `linenos`, and most other options not related to syntax highlighting will still function in draft mode.

Documents can usually be compiled without shell escape in draft mode. The `ifplatform` package may issue a warning about limited functionality due to shell escape being disabled, but this may be ignored in almost all cases. (Shell escape is only really required if you have an unusual system configuration such that the `\ifwindows` macro must fall back to using shell escape to determine the system. See the `ifplatform` documentation for more details: <http://www.ctan.org/pkg/ifplatform>.)

If the `cache` option is set, then all existing cache files will be kept while draft mode is on. This allows caching to be used intermitently with draft mode without requiring that the cache be completely recreated each time. Automatic cleanup of cached files will resume as soon as draft mode is turned off. (This assumes that the auxiliary file has not been deleted in the meantime; it contains the cache history and allows automatic cleanup of unused files.)

```
final=<boolean>
(default: true)
```

This is the opposite of `draft`; it is equivalent to `draft=false`. Again, note that `draft` and `final` settings are typically inherited from the document class.

```
kpsewhich=<boolean>
(default: false)
```

This option uses `kpsewhich` to locate files that are to be highlighted. Some build tools such as `texi2pdf` function by modifying `TEXINPUTS`; in some cases, users may customize `TEXINPUTS` as well. The `kpsewhich` option allows `minted` to work with such configurations.

This option may add a noticeable amount of overhead on some systems, or with some system configurations.

This option does *not* make `minted` work with the `-output-directory` and `-aux-directory` command-line options for \LaTeX . For those, see the `outdir` package option.

Under Windows, this option currently requires that PowerShell be installed. It may need to be installed in versions of Windows prior to Windows 7.

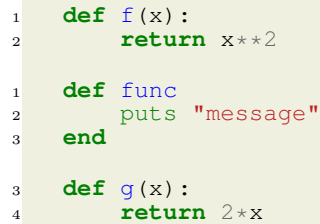
```
langlinenos=<boolean>
(default: false)
```

`minted` uses the `fancyvrb` package behind the scenes for the code typesetting. `fancyvrb` provides an option `firstnumber` that allows the starting line number of an environment to be specified. For convenience, there is an option `firstnumber=last` that allows line numbering to pick up where it left off. The `langlinenos` option makes `firstnumber` work for each language individually with all `minted` and `\mint` usages. For example, consider the code and output below.

```
\begin{minted}[linenos]{python}
def f(x):
    return x**2
\end{minted}

\begin{minted}[linenos]{ruby}
def func
    puts "message"
end
\end{minted}

\begin{minted}[linenos, firstnumber=last]{python}
def g(x):
    return 2*x
\end{minted}
```



```
1  def f(x):
2      return x**2

1  def func
2      puts "message"
3  end

3  def g(x):
4      return 2*x
```

Without the `langlinenos` option, the line numbering in the second Python environment would not pick up where the first Python environment left off. Rather, it would pick up with the Ruby line numbering.

```
newfloat=<boolean>
(default: false)
```

By default, the `listing` environment is created using the `float` package. The `newfloat` option creates the environment using `newfloat` instead. This provides better integration with the `caption` package.

```
outputdir=<directory>
(default: <none>)
```

The `-output-directory` and `-aux-directory` (MiKTeX) command-line options for \LaTeX cause problems for `minted`, because the `minted` temporary files are saved in `<outputdir>`, but `minted` still looks for them in the document root directory. There is no way to access the value of the command-line option so that `minted` can automatically look in the right place. But it is possible to allow the output directory to be specified manually as a package option.

The output directory should be specified using an absolute path or a path relative to the document root directory. Paths should use forward spaces, even under

Windows. Special characters must be escaped, while spaces require quoting and need the entire *<directory>* to be wrapped in curly braces {}. See `cachedir` above for examples of escaping and quoting.

`section` To control how L^AT_EX counts the listing floats, you can pass either the `section` or `chapter` option when loading the `minted` package.

6.2 Macro option usage

All `minted` highlighting commands accept the same set of options. Options are specified as a comma-separated list of `key=value` pairs. For example, we can specify that the lines should be numbered:

```
\begin{minted}[linenos=true]{c++}
#include <iostream>
int main() {
    std::cout << "Hello "
               << "world"
               << std::endl;
}
\end{minted}
1 #include <iostream>
2 int main() {
3     std::cout << "Hello "
4               << "world"
5               << std::endl;
6 }
```

An option value of `true` may also be omitted entirely (including the “=”). To customize the display of the line numbers further, override the `\theFancyVerbLine` command. Consult the `fancyvrb` documentation for details.

`\mint` accepts the same options:

```
\mint[linenos]{perl}|$x=~ /foo/| 1 $x=~ /foo/
```

Here’s another example: we want to use the L^AT_EX math mode inside comments:

```
\begin{minted}[mathescape]{python}
# Returns $\sum_{i=1}^n i$
def sum_from_one_to(n):
    r = range(1, n + 1)
    return sum(r)
\end{minted}
# Returns  $\sum_{i=1}^n i$ 
def sum_from_one_to(n):
    r = range(1, n + 1)
    return sum(r)
```

To make your L^AT_EX code more readable you might want to indent the code inside a `minted` environment. The option `gobble` removes these unnecessary whitespace characters from the output. There is also an `autogobble` option that detects the length of this whitespace automatically.

<pre>\begin{minted}[gobble=2, showspaces]{python} def boring(args = None): pass \end{minted}</pre>	<pre>def_boring(args_=None): pass</pre>
versus	versus
<pre>\begin{minted}[showspaces]{python} def boring(args = None): pass \end{minted}</pre>	<pre>def_boring(args_=None): pass</pre>

`\setminted` You may wish to set options for the document as a whole, or for an entire language. This is possible via `\setminted[language]{key=value,...}`. Language-specific options override document-wide options. Individual command and environment options override language-specific options.

`\setmintedinline` You may wish to set separate options for `\mintinline`, either for the document as a whole or for a specific language. This is possible via `\setmintedinline`. The syntax is `\setmintedinline[language]{key=value,...}`. Language-specific options override document-wide options. Individual command options override language-specific options. All settings specified with `\setmintedinline` override those set with `\setminted`. That is, inline settings always have a higher precedence than general settings.

6.3 Available options

Following is a full list of available options. For more detailed option descriptions please refer to the `fancyvrb` and `Pygments` documentation.

`autogobble` (boolean) (default: false)
Remove (gobble) all common leading whitespace from code. Essentially a version of `gobble` that automatically determines what should be removed. Good for code that originally is not indented, but is manually indented after being pasted into a L^AT_EX document.

<pre>...text. \begin{minted}[autogobble]{python} def f(x): return x**2 \end{minted}</pre>	<pre>...text. def f(x): return x**2</pre>
---	---

`baselinestretch` (auto|dimension) (default: auto)
Value to use as for `baselinestretch` inside the listing.

`breakafter` (string) (default: `<none>`)
Break lines after specified characters, not just at spaces, when `breaklines=true`. For example, `breakafter=-/` would allow breaks after any hyphens or slashes. Special characters given to `breakafter` should be backslash-escaped (usually #, {, }, %, [,]; the backslash `\` may be obtained via `\\`).

For an alternative, see `breakbefore`. When `breakbefore` and `breakafter` are used for the same character, `breakbeforegroup` and `breakaftergroup` must both have the same setting.

```
\begin{minted}[breaklines, breakafter=d]{python}
some_string = 'SomeTextThatGoesOnAndOnForSoLongThatItCouldNeverFitOnOneLine'
\end{minted}

_____

some_string = 'SomeTextThatGoesOnAndOnForSoLongThatItCouldj
↳ NeverFitOnOneLine'
```

`breakaftergroup` (boolean) (default: true)
When `breakafter` is used, group all adjacent identical characters together, and only allow a break after the last character. When `breakbefore` and `breakafter` are used for the same character, `breakbeforegroup` and `breakaftergroup` must both have the same setting.

`breakaftersymbolpre` (string) (default: `\,\footnotesize\ensuremath{_\rfloor}`)
The symbol inserted pre-break for breaks inserted by `breakafter`.

`breakaftersymbolpost` (string) (default: `<none>`)
The symbol inserted post-break for breaks inserted by `breakafter`.

`breakanywhere` (boolean) (default: false)
Break lines anywhere, not just at spaces, when `breaklines=true`.

```
\begin{minted}[breaklines, breakanywhere]{python}
some_string = 'SomeTextThatGoesOnAndOnForSoLongThatItCouldNeverFitOnOneLine'
\end{minted}

_____

some_string = 'SomeTextThatGoesOnAndOnForSoLongThatItCouldNevj
↳ erFitOnOneLine'
```

`breakanywheresymbolpre` (string) (default: `\,\footnotesize\ensuremath{_\rfloor}`)
The symbol inserted pre-break for breaks inserted by `breakanywhere`.

`breakanywheresymbolpost` (string) (default: `<none>`)
The symbol inserted post-break for breaks inserted by `breakanywhere`.

`breakautoindent` (boolean) (default: true)
When a line is broken, automatically indent the continuation lines to the indentation level of the first line. When `breakautoindent` and `breakindent` are used together, the indentations add. This indentation is combined with `breaksymbolindentleft` to give the total actual left indentation. Does not apply to `\mintinline`.

`breakbefore` (string) (default: `<none>`)
Break lines before specified characters, not just at spaces, when `breaklines=true`. For example, `breakbefore=A` would allow breaks before capital A's. Special

characters given to `breakbefore` should be backslash-escaped (usually `#`, `{`, `}`, `%`, `[`, `]`; the backslash `\` may be obtained via `\\`).

For an alternative, see `breakafter`. When `breakbefore` and `breakafter` are used for the same character, `breakbeforegroup` and `breakaftergroup` must both have the same setting.

```
\begin{minted}[breaklines, breakbefore=A]{python}
some_string = 'SomeTextThatGoesOnAndOnForSoLongThatItCouldNeverFitOnOneLine'
\end{minted}

some_string = 'SomeTextThatGoesOn_
↪ AndOnForSoLongThatItCouldNeverFitOnOneLine'
```

`breakbeforegroup` (boolean) (default: true)
When `breakbefore` is used, group all adjacent identical characters together, and only allow a break before the first character. When `breakbefore` and `breakafter` are used for the same character, `breakbeforegroup` and `breakaftergroup` must both have the same setting.

`breakbeforesymbolpre` (string) (default: `\,\footnotesize\ensuremath{_\rflfloor}, _`)
The symbol inserted pre-break for breaks inserted by `breakbefore`.

`breakbeforesymbolpost` (string) (default: `<none>`)
The symbol inserted post-break for breaks inserted by `breakbefore`.

`breakbytoken` (boolean) (default: false)
Only break lines at locations that are not within tokens; prevent tokens from being split by line breaks. By default, `breaklines` causes line breaking at the space nearest the margin. While this minimizes the number of line breaks that are necessary, it can be inconvenient if a break occurs in the middle of a string or similar token.

This is not compatible with draft mode. A complete list of Pygments tokens is available at <http://pygments.org/docs/tokens/>. If the breaks provided by `breakbytoken` occur in unexpected locations, it may indicate a bug or shortcoming in the Pygments lexer for the language.

`breakbytokenanywhere` (boolean) (default: false)
Like `breakbytoken`, but also allows line breaks between immediately adjacent tokens, not just between tokens that are separated by spaces. Using `breakbytokenanywhere` with `breakanywhere` is redundant.

`breakindent` (dimension) (default: 0pt)
When a line is broken, indent the continuation lines by this amount. When `breakautoindent` and `breakindent` are used together, the indentations add. This indentation is combined with `breaksymbolindentleft` to give the total actual left indentation. Does not apply to `\mintinline`.

`breaklines` (boolean) (default: false)
Automatically break long lines in minted environments and `\mint` commands, and wrap longer lines in `\mintinline`.

This is not compatible with the option `obeytabs`. Additional information about the incompatibility is on [GitHub](#).

By default, automatic breaks occur at space characters. Use `breakanywhere` to enable breaking anywhere; use `breakbytoken`, `breakbytokenanywhere`, and `breakafter` for more fine-tuned breaking. Using `escapeinside` to escape to \LaTeX and then insert a manual break is also an option. For example, use `escapeinside=||`, and then insert `||\|` at the appropriate point. (Note that `escapeinside` does not work within strings.)

<pre>...text. \begin{minted}[breaklines]{python} def f(x): return 'Some text ' + str(x) \end{minted}</pre>	<pre>...text. def f(x): return 'Some text ' + ↪ str(x)</pre>
--	--

Breaking in `minted` and `\mint` may be customized in several ways. To customize the indentation of broken lines, see `breakindent` and `breakautoindent`. To customize the line continuation symbols, use `breaksymbolleft` and `breaksymbolright`. To customize the separation between the continuation symbols and the code, use `breaksymbolsepleft` and `breaksymbolsepright`. To customize the extra indentation that is supplied to make room for the break symbols, use `breaksymbolindentleft` and `breaksymbolindentright`. Since only the left-hand symbol is used by default, it may also be modified using the alias options `breaksymbol`, `breaksymbolsep`, and `breaksymbolindent`. Note than none of these options applies to `\mintinline`, since they are not relevant in the inline context.

An example using these options to customize the `minted` environment is shown below. This uses the `\carriagereturn` symbol from the `dingbat` package.

```

\begin{minted}[breaklines,
                breakautoindent=false,
                breaksymbolleft=\raisebox{0.8ex}{\small\reflectbox{\carriagereturn}},
                breaksymbolindentleft=0pt,
                breaksymbolsepleft=0pt,
                breaksymbolright=\small\carriagereturn,
                breaksymbolindentright=0pt,
                breaksymbolsepright=0pt]{python}

def f(x):
    return 'Some text ' + str(x) + ' some more text ' +
        ↪ str(x) + ' even more text that goes on for a
        ↪ while'
\end{minted}

def f(x):
    return 'Some text ' + str(x) + ' some more text ' + ↪
↪ str(x) + ' even more text that goes on for a while'

```

Automatic line breaks are limited with Pygments styles that use a colored background behind large chunks of text. This coloring is accomplished with `\colorbox`, which cannot break across lines. It may be possible to create an alternative to `\colorbox` that supports line breaks, perhaps with TikZ, but the author is unaware of a satisfactory solution. The only current alternative is to redefine `\colorbox` so that it does nothing. For example,

```
\AtBeginEnvironment{minted}{\renewcommand{\colorbox}[3][{}]{#3}}
```

uses the `etoolbox` package to redefine `\colorbox` within all minted environments.

Automatic line breaks will not work with `showspaces=true` unless you use `breakanywhere`. You may be able to change the definition of `\FV@Space` if you need this; see the `fancyvrb` implementation for details.

`breaksymbol` (string) (default: `breaksymbolleft`)
Alias for `breaksymbolleft`.

`breaksymbolleft` (string) (default: `\tiny\ensuremath{\hookrightarrow}`, `↪`)
The symbol used at the beginning (left) of continuation lines when `breaklines=true`. To have no symbol, simply set `breaksymbolleft` to an empty string (“=,” or “={}”). The symbol is wrapped within curly braces {} when used, so there is no danger of formatting commands such as `\tiny` “escaping.”

The `\hookrightarrow` and `\hookleftarrow` may be further customized by the use of the `\rotatebox` command provided by `graphicx`. Additional arrow-type symbols that may be useful are available in the `dingbat` (`\carriagereturn`) and `mnsymbol` (hook and curve arrows) packages, among others.

Does not apply to `\mintinline`.

`breaksymbolright` (string) (default: `{none}`)

The symbol used at breaks (right) when `breaklines=true`. Does not appear at the end of the very last segment of a broken line.

`breaksymbolindent` (dimension) (default: `breaksymbolindentleft`)
Alias for `breaksymbolindentleft`.

`breaksymbolindentleft` (dimension) (default: width of 4 characters in teletype font at default point size)
The extra left indentation that is provided to make room for `breaksymbolleft`. This indentation is only applied when there is a `breaksymbolleft`.

This may be set to the width of a specific number of (fixed-width) characters by using an approach such as

```
\newdimen\temporarydimen
\settowidth{\temporarydimen}{\ttfamily aaaa}
```

and then using `breaksymbolindentleft=\temporarydimen`.

Does not apply to `\mintinline`.

`breaksymbolindentright` (dimension) (default: width of 4 characters in teletype font at default point size)
The extra right indentation that is provided to make room for `breaksymbolright`. This indentation is only applied when there is a `breaksymbolright`.

`breaksymbolsep` (dimension) (default: `breaksymbolsepleft`)
Alias for `breaksymbolsepleft`

`breaksymbolsepleft` (dimension) (default: 1em)
The separation between the `breaksymbolleft` and the adjacent code. Does not apply to `\mintinline`.

`breaksymbolsepright` (dimension) (default: 1em)
The separation between the `breaksymbolright` and the adjacent code.

`bgcolor` (string) (default: `<none>`)
Background color of the listing. Be aware that this option has several limitations (described below); see “Framing alternatives” below for more powerful alternatives.

The value of this option must *not* be a color command. Instead, it must be a color *name*, given as a string, of a previously-defined color:

```
\definecolor{bg}{rgb}{0.95,0.95,0.95}
\begin{minted}[bgcolor=bg]{php}
<?php
    echo "Hello, $x";
?>
\end{minted}
```

```
<?php
    echo "Hello, $x";
?>
```

This option puts minted environments and `\mint` commands in a `snugshade*` environment from the `framed` package, which supports breaks across pages. (Prior to `minted` 2.2, a `minipage` was used, which prevented page breaks and gave undesirable spacing from surrounding text.) Be aware that if `bgcolor` is used with `breaklines=true`, and a line break occurs just before a page break, then text

may extend below the colored background in some instances. It is best to use a more advanced framing package in those cases; see “Framing alternatives” below.

This option puts `\mintinline` inside a `\colorbox`, which **does not allow line breaks**. If you want to use `\setminted` to set background colors, and only want background colors on `\minted` and `\mint`, you may use `\setmintedinline{bgcolor={}}` to turn off the coloring for inline commands.

Framing alternatives

If you want more reliable and advanced options for background colors and framing, you should consider a more advanced framing package such as `mdframed` or `tcolorbox`. It is easy to add framing to `\minted` commands and environments using the `etoolbox` package, which is automatically loaded by `\minted`. For example, using `mdframed`:

```
\BeforeBeginEnvironment{minted}{\begin{mdframed}}
\AfterEndEnvironment{minted}{\end{mdframed}}
```

Some framing packages also provide built-in commands for such purposes. For example, `mdframed` provides a `\surroundwithmdframed` command, which could be used to add a frame to all `\minted` environments:

```
\surroundwithmdframed{minted}
```

`tcolorbox` even provides a built-in framing environment with `\minted` support. Simply use `\tcboxuselibrary{minted}` in the preamble, and then put code within a `\tcblisting` environment:

```
\begin{tcblisting}{<tcbox options>,
                    minted language=<language>,
                    minted style=<style>,
                    minted options={<option list>} }
<code>
\end{tcblisting}
```

`tcolorbox` provides other commands and environments for fine-tuning listing appearance and for working with external code files.

<code>codetagify</code>	(list of strings) (default: highlight xxx, TODO, BUG, and NOTE) Highlight special code tags in comments and docstrings.
<code>encoding</code>	(string) (default: system-specific) Sets the file encoding that Pygments expects. See also <code>outencoding</code> .
<code>escapeinside</code>	(string) (default: <code><none></code>) Escape to \LaTeX between the two characters specified in <code>(string)</code> . All code between the two characters will be interpreted as \LaTeX and typeset accordingly. This allows for additional formatting. The escape characters need not be identical.

Special L^AT_EX characters must be escaped when they are used as the escape characters (for example, `escapeinside=\#\%`). Requires Pygments 2.0+.

Escaping does not work inside strings and comments (for comments, there is `texcomments`). As of Pygments 2.0.2, this means that escaping is “fragile” with some lexers. Due to the way that Pygments implements `escapeinside`, any “escaped” L^AT_EX code that resembles a string or comment for the current lexer may break `escapeinside`. There is a [Pygments issue](#) for this case. Additional details and a limited workaround for some scenarios are available on the [minted GitHub site](#).

```
\begin{minted}[escapeinside=||]{py}
def f(x):
    y = x|\colorbox{green}{**}|2
    return y
\end{minted}
def f(x):
    y = x**2
    return y
```

Note that when math is used inside escapes, in a few cases ligature handling may need to be modified. The single-quote character (') is normally a shortcut for `^{\prime}` in math mode, but this is disabled in verbatim content as a byproduct of ligatures being disabled. For the same reason, any package that relies on active characters in math mode (for example, `icomma`) will produce errors along the lines of TeX capacity exceeded and `\leavevmode\kern\z@`. This may be fixed by modifying `\@noligs`, as described at <http://tex.stackexchange.com/questions/223876>. `minted` currently does not attempt to patch `\@noligs` due to the potential for package conflicts.

<code>firstline</code>	(integer) (default: 1) The first line to be shown. All lines before that line are ignored and do not appear in the output.
<code>firstnumber</code>	(auto integer) (default: auto = 1) Line number of the first line.
<code>fontfamily</code>	(family name) (default: tt) The font family to use. tt, courier and helvetica are pre-defined.
<code>fontseries</code>	(series name) (default: auto – the same as the current font) The font series to use.
<code>fontsize</code>	(font size) (default: auto – the same as the current font) The size of the font to use, as a size command, e.g. <code>\footnotesize</code> .
<code>fontshape</code>	(font shape) (default: auto – the same as the current font) The font shape to use.
<code>formatcom</code>	(command) (default: <code>\none</code>) A format to execute before printing verbatim text.
<code>frame</code>	(none leftline topline bottomline lines single) (default: none) The type of frame to put around the source code listing.

<code>framerule</code>	(dimension) Width of the frame.	(default: 0.4pt)
<code>framesep</code>	(dimension) Distance between frame and content.	(default: <code>\fboxsep</code>)
<code>funcnamehighlighting</code>	(boolean) [For PHP only] If <code>true</code> , highlights built-in function names.	(default: <code>true</code>)
<code>gobble</code>	(integer) Remove the first n characters from each input line.	(default: 0)
<code>keywordcase</code>	(string) Changes capitalization of keywords. Takes 'lower', 'upper', or 'capitalize'.	(default: 'lower')
<code>label</code>	(string) Add a label to the top, the bottom or both of the frames around the code. See the <code>fancyvrb</code> documentation for more information and examples. <i>Note:</i> This does <i>not</i> add a <code>\label</code> to the current listing. To achieve that, use a floating environment (section 5) instead.	(default: <i>empty</i>)
<code>labelposition</code>	(none topline bottomline all) Position where to print the label (see above; default: <code>topline</code> if one label is defined, <code>all</code> if two are defined, <i>none</i> else). See the <code>fancyvrb</code> documentation for more information.	(default: <code>topline</code> , <code>all</code> or <i>none</i>)
<code>lastline</code>	(integer) The last line to be shown.	(default: <i>last line of input</i>)
<code>linenos</code>	(boolean) Enables line numbers. In order to customize the display style of line numbers, you need to redefine the <code>\theFancyVerbLine</code> macro:	(default: <code>false</code>)
	<pre> \renewcommand{\theFancyVerbLine}{\sffamily \textcolor[rgb]{0.5,0.5,1.0}{\scriptsize \oldstylenums{\arabic{FancyVerbLine}}}} \begin{minted}[linenos, firstnumber=11]{python} def all(iterable): for i in iterable: if not i: return False return True \end{minted} </pre>	
<code>numbers</code>	(left right) Essentially the same as <code>linenos</code> , except the side on which the numbers appear may be specified.	(default: <i>none</i>)
<code>mathescape</code>	(boolean) Enable L ^A T _E X math mode inside comments. Usage as in package <code>listings</code> . See the note under <code>escapeinside</code> regarding math and ligatures.	(default: <code>false</code>)

<code>numberblanklines</code>	(boolean) Enables or disables numbering of blank lines.	(default: <code>true</code>)
<code>numbersep</code>	(dimension) Gap between numbers and start of line.	(default: <code>12pt</code>)
<code>obeytabs</code>	(boolean) Due to the many issues with <code>fancyvrb</code>'s implementation of <code>obeytabs</code>, this option should be avoided if possible. Treat tabs as tabs instead of converting them to spaces. This is not compatible with the option <code>breaklines</code>. This will cause errors with tabbed indentation inside multiline comments. There is a GitHub issue with additional technical details.	(default: <code>false</code>)
<code>outencoding</code>	(string) Sets the file encoding that Pygments uses for highlighted output. Overrides any encoding previously set via <code>encoding</code> .	(default: system-specific)
<code>python3</code>	(boolean) [For <code>PythonConsoleLexer</code> only] Specifies whether Python 3 highlighting is applied.	(default: <code>false</code>)
<code>resetmargins</code>	(boolean) Resets the left margin inside other environments.	(default: <code>false</code>)
<code>rulecolor</code>	(color command) The color of the frame.	(default: <code>black</code>)
<code>samepage</code>	(boolean) Forces the whole listing to appear on the same page, even if it doesn't fit.	(default: <code>false</code>)
<code>showspaces</code>	(boolean) Enables visible spaces: <code>visible_spaces</code> .	(default: <code>false</code>)
<code>showtabs</code>	(boolean) Enables visible tabs—only works in combination with <code>obeytabs</code> .	(default: <code>false</code>)
<code>startinline</code>	(boolean) [For PHP only] Specifies that the code starts in PHP mode, i.e., leading <code><?php</code> is omitted.	(default: <code>false</code>)
<code>style</code>	(string) Sets the stylesheet used by Pygments.	(default: <code>default</code>)
<code>stepnumber</code>	(integer) Interval at which line numbers appear.	(default: <code>1</code>)
<code>stripall</code>	(boolean) Strip all leading and trailing whitespace from the input.	(default: <code>false</code>)
<code>stripnl</code>	(boolean)	(default: <code>true</code>)

Strip leading and trailing newlines from the input.

`tabsize` (integer) (default: 8)
The number of spaces a tab is equivalent to. If `obeytabs` is *not* active, tabs will be converted into this number of spaces. If `obeytabs` is active, tab stops will be set this number of space characters apart.

`texcl` (boolean) (default: false)
Enables \LaTeX code inside comments. Usage as in package `listings`. See the note under `escapeinside` regarding math and ligatures.

`texcomments` (boolean) (default: false)
Enables \LaTeX code inside comments. The newer name for `texcl`. See the note under `escapeinside` regarding math and ligatures.

As of Pygments 2.0.2, `texcomments` fails with multiline C/C++ preprocessor directives, and may fail in some other circumstances. This is because preprocessor directives are `tokenized as Comment.Preproc`, so `texcomments` causes preprocessor directives to be treated as literal \LaTeX code. [An issue has been opened at the Pygments site](#); additional details are also available on the [minted GitHub site](#).

`xleftmargin` (dimension) (default: 0)
Indentation to add before the listing.

`xrightmargin` (dimension) (default: 0)
Indentation to add after the listing.

7 Defining shortcuts

Large documents with a lot of listings will nonetheless use the same source language and the same set of options for most listings. Always specifying all options is redundant, a lot to type and makes performing changes hard.

One option is to use `\setminted`, but even then you must still specify the language each time.

`minted` therefore defines a set of commands that lets you define shortcuts for the highlighting commands. Each shortcut is specific for one programming language.

`\newminted` `\newminted` defines a new alias for the `minted` environment:

```
\newminted{cpp}{gobble=2,linenos}

\begin{cppcode}                                1 template <typename T>
  template <typename T>                          2 T id(T value) {
    T id(T value) {                             3     return value;
      return value;                             4   }
    }
\end{cppcode}
```

If you want to provide extra options on the fly, or override existing default options, you can do that, too:

```
\newminted{cpp}{gobble=2,linenos}
\begin{cppcode*}{linenos=false,
                 frame=single}
    int const answer = 42;
\end{cppcode*}
```

```
int const answer = 42;
```

Notice the star “*” behind the environment name—due to restrictions in `fancyvrb`’s handling of options, it is necessary to provide a *separate* environment that accepts options, and the options are *not* optional on the starred version of the environment.

The default name of the environment is `\languagecode`. If this name clashes with another environment or if you want to choose an own name for another reason, you may do so by specifying it as the first argument: `\newminted[\environment name]{\language}{\options}`.

Like normal `minted` environments, environments created with `\newminted` may be used within other environment definitions. Since the `minted` environments use `fancyvrb` internally, any environment based on them must include the `fancyvrb` command `\VerbatimEnvironment`. This allows `fancyvrb` to determine the name of the environment that is being defined, and correctly find its end. It is best to include this command at the beginning of the definition. For example,

```
\newminted{cpp}{gobble=2,linenos}
\newenvironment{env}{\VerbatimEnvironment\begin{cppcode}}{\end{cppcode}}
```

`\newmint`

The above macro only defines shortcuts for the `minted` environment. The main reason is that the short command form `\mint` often needs different options—at the very least, it will generally not use the `gobble` option. A shortcut for `\mint` is defined using `\newmint[\macro name]{\language}{\options}`. The arguments and usage are identical to `\newminted`. If no `\macro name` is specified, `\language` is used.

```
\newmint{perl}{showspaces}
\perl/my $foo = $bar;/
```

```
my_$foo_=$bar;
```

`\newmintinline`

This creates custom versions of `\mintinline`. The syntax is the same as that for `\newmint`: `\newmintinline[\macro name]{\language}{\options}`. If a `\macro name` is not specified, then the created macro is called `\languageinline`.

```
\newmintinline{perl}{showspaces}
X\perlinline/my $foo = $bar;/X
```

```
Xmy_$foo_=$bar;X
```

`\newmintedfile`

This creates custom versions of `\inputminted`. The syntax is

```
\newmintedfile[\macro name]{\language}{\options}
```

If no `\langle macro name \rangle` is given, then the macro is called `\langle language \rangle file`.

8 FAQ and Troubleshooting

In some cases, `minted` may not give the desired result due to other document settings that it cannot control. Common issues are described below, with workarounds or solutions. You may also wish to search tex.stackexchange.com or ask a question there, if you are working with `minted` in a non-typical context.

- **I receive a “Font Warning: Some font shapes were not available” message, or bold or italic seem to be missing.** This due to a limitation in the font that is currently in use for typesetting code. In some cases, the default font shapes that L^AT_EX substitutes are perfectly adequate, and the warning may be ignored. In other cases, the font substitutions may not clearly indicate bold or italic text, and you will want to switch to a different font. See The L^AT_EX Font Catalogue’s section on [Typewriter Fonts](#) for alternatives. If you like the default L^AT_EX fonts, the `lmodern` package is a good place to start. The `beramono` and `courier` packages may also be good options.
- **I receive a “Too many open files” error under OS X when using caching.** See the note on OS X under Section [4.1](#).
- **Weird things happen when I use the fancybox package.** `fancybox` conflicts with `fancyvrb`, which `minted` uses internally. When using `fancybox`, make sure that it is loaded before `minted` (or before `fancyvrb`, if `fancyvrb` is not loaded by `minted`).
- **When I use minted with KOMA-Script document classes, I get warnings about \float@addtolists.** `minted` uses the `float` package to produce floated listings, but this conflicts with the way KOMA-Script does floats. Load the package `scrhack` to resolve the conflict. Or use `minted`’s `newfloat` package option.
- **Tilde characters ~ are raised, almost like superscripts.** This is a font issue. You need a different font encoding, possibly with a different font. Try `\usepackage[T1]{fontenc}`, perhaps with `\usepackage{lmodern}`, or something similar.
- **I’m getting errors with math, something like TeX capacity exceeded and \leavevmode\kern\z@.** This is due to ligatures being disabled within verbatim content. See the note under `escapeinside`.
- **Quotation marks and backticks don’t look right. Backtick characters ` are appearing as left quotes. Single quotes are appearing as curly right quotes.** This is due to how Pygments outputs L^AT_EX code, combined with how L^AT_EX deals with verbatim content. Try `\usepackage{upquote}`.

- **I'm getting errors with Beamer.** Due to how Beamer treats verbatim content, you may need to use either the `fragile` or `fragile=singleslide` options for frames that contain `minted` commands and environments. `fragile=singleslide` works best, but it disables overlays. `fragile` works by saving the contents of each frame to a temp file and then reusing them. This approach allows overlays, but will break if you have the string `\end{frame}` at the beginning of a line (for example, in a `minted` environment). To work around that, you can indent the content of the environment (so that the `\end{frame}` is preceded by one or more spaces) and then use the `gobble` or `autogobble` options to remove the indentation.
- **Tabs are eaten by Beamer.** This is due to a [bug in Beamer's treatment of verbatim content](#). Upgrade Beamer or use the linked patch. Otherwise, try `fragile=singleslide` if you don't need overlays, or consider using `\inputminted` or converting the tabs into spaces.
- **I'm trying to create several new `minted` commands/environments, and want them all to have the same settings. I'm saving the settings in a macro and then using the macro when defining the commands/environments. But it's failing.** This is due to the way that `keyval` works (`minted` uses it to manage options). Arguments are not expanded. See [this](#) and [this](#) for more information. It is still possible to do what you want; you just need to expand the options macro before passing it to the commands that create the new commands/environments. An example is shown below. The `\expandafter` is the vital part.

```
\def\args{linenos,frame=single,fontsize=\footnotesize,style=bw}

\newcommand{\makenewmintedfiles}[1]{%
  \newmintedfile[inputlatex]{latex}{#1}%
  \newmintedfile[inputc]{c}{#1}%
}

\expandafter\makenewmintedfiles\expandafter{\args}
```

- **I want to use `\mintinline` in a context that normally doesn't allow verbatim content.** The `\mintinline` command will already work in many places that do not allow normal verbatim commands like `\verb`, so make sure to try it first. If it doesn't work, one of the simplest alternatives is to save your code in a box, and then use it later. For example,

```
\newsavebox\mybox
\begin{lrbox}{\mybox}
\mintinline{cpp}{std::cout}
\end{lrbox}

\commandthatdoesnotlikeverbatim{Text \usebox{\mybox}}
```

- **Extended characters do not work inside minted commands and environments, even when the inputenc package is used.** Version 2.0 adds support for extended characters under the pdfTeX engine. But if you need characters that are not supported by inputenc, you should use the XeTeX or LuaTeX engines instead.
- **The polyglossia package is doing undesirable things to code. (For example, adding extra space around colons in French.)** You may need to put your code within `\begin{english}...\end{english}`. This may be done for all minted environments using etoolbox in the preamble:

```
\usepackage{etoolbox}
\BeforeBeginEnvironment{minted}{\begin{english}}
\AfterEndEnvironment{minted}{\end{english}}
```

- **Tabs are being turned into the character sequence `^I`.** This happens when you use XeLaTeX. You need to use the `-8bit` command-line option so that tabs may be written correctly to temporary files. See <http://tex.stackexchange.com/questions/58732/how-to-output-a-tabulation-into-a-file> for more on XeLaTeX's handling of tab characters.
- **The caption package produces an error when `\captionof` and other commands are used in combination with minted.** Load the caption package with the option `compatibility=false`. Or better yet, use minted's `newfloat` package option, which provides better caption compatibility.
- **I need a listing environment that supports page breaks.** The built-in listing environment is a standard float; it doesn't support page breaks. You will probably want to define a new environment for long floats. For example,

```
\usepackage{caption}
\newenvironment{longlisting}{\captionsetup{type=listing}}{}
```

With the caption package, it is best to use minted's `newfloat` package option. See <http://tex.stackexchange.com/a/53540/10742> for more on listing environments with page breaks.

- **I want to use a custom script/executable to access Pygments, rather than pygmentize.** Redefine `\MintedPygmentize`:

```
\renewcommand{\MintedPygmentize}{...}
```

- **I want to use the command-line option `-output-directory`, or MiKTeX's `-aux-directory`, but am getting errors.** Use the package option `outdir` to specify the location of the output directory. Unfortunately, there is no way for minted to detect the output directory automatically.

- **I want extended characters in frame labels, but am getting errors.** This can happen with `minted <2.0` and Python 2.7, due to a [terminal encoding issue with Pygments](#). It should work with any version of Python with `minted 2.0+`, which processes labels internally and does not send them to Python.
- **`minted` environments have extra vertical space inside `tabular`.** It is possible to [create a custom environment](#) that eliminates the extra space. However, a general solution that behaves as expected in the presence of adjacent text remains to be found.
- **I'm receiving a warning from `lineno.sty` that “Command `\@parboxrestore` has changed.”** This can happen when `minted` is loaded after `csquotes`. Try loading `minted` first. If you receive this message when you are not using `csquotes`, you may want to experiment with the order of loading packages and might also open an issue.

Acknowledgements

Konrad Rudolph: Special thanks to Philipp Stephani and the rest of the guys from `comp.text.tex` and `tex.stackexchange.com`.

Geoffrey Poore: Thanks to Marco Daniel for the code on `tex.stackexchange.com` that inspired automatic line breaking. Thanks to Patrick Vogt for improving TikZ externalization compatibility.

Version History

v2.2.2 (2016/06/21)

- Fixed a bug introduced in v2.2 that prevented setting the Pygments style in the preamble. Style definitions are now more compatible with using `\MintedPygmentize` to call a custom `pygmentize`.

v2.2.1 (2016/06/15)

- The `shellesc` package is loaded before `ifplatform` and other packages that might invoke `\write18` (#112).
- When caching is enabled, XeTeX uses the new `\mdfivesum` macro from TeX Live 2016 to hash cache content, rather than using `\ShellEscape` with Python to perform hashing.

v2.2 (2016/06/08)

- All uses of `\ShellEscape` (`\write18`) no longer wrap file names and paths with double quotes. This allows a cache directory to be specified relative to a user's home directory, for example, `~/minted_cache`.

`cachedir` and `outputdir` paths containing spaces will now require explicit quoting of the parts of the paths that contain spaces, since `minted` no longer supplies quoting. See the updated documentation for examples (#89).

- Added `breakbefore`, `breakbeforegroup`, `breakbeforesymbolpre`, and `breakbeforesymbolpost`. These parallel `breakafter*`. It is possible to use `breakbefore` and `breakafter` for the same character, so long as `breakbeforegroup` and `breakaftergroup` have the same setting (#117).
- Added package options `finalizcache` and `frozenscache`. These allow the cache to be prepared for (`finalizcache`) and then used (`frozenscache`) in an environment in which `-shell-escape`, Python, and/or Pygments are not available. Note that this only works if `minted` content does not need to be modified, and if no settings that depend on Pygments or Python need to be changed (#113).
- Style names containing hyphens and underscores (`paraiso-light`, `paraiso-dark`, `algol_nu`) now work (#111).
- The `shellesc` package is now loaded, when available, for compatibility with LuaTeX 0.87+ (TeX Live 2016+, etc.). `\ShellEscape` is now used everywhere instead of `\immediate\write18`. If `shellesc` is not available, then a `\ShellEscape` macro is created. When `shellesc` is loaded, there is a check for versions before v0.01c to patch a bug in v0.01b (present in TeX Live 2015) (#112).
- The `bgcolor` option now uses the `snugshade*` environment from the `framed` package, so `bgcolor` is now compatible with page breaks. When `bgcolor` is in use, immediately preceding text will no longer push the `minted` environment into the margin, and there is now adequate spacing from surrounding text (#121).
- Added missing support for `fancyvrb`'s `labelposition` (#102).
- Improved fix for TikZ externalization, thanks to Patrick Vogt (#73).
- Fixed `breakautoindent`; it was disabled in version 2.1 due to a bug in `breakanywhere`.
- Properly fixed handling of `\MintedPygmentize` (#62).
- Added note on incompatibility of `breaklines` and `obeytabs` options. Trying to use these together will now result in a package error (#99). Added note on issues with `obeytabs` and multiline comments (#88). Due to the various `obeytabs` issues, the docs now discourage using `obeytabs`.
- Added note to FAQ on `fancybox` and `fancyvrb` conflict (#87).
- Added note to docs on the need for `\VerbatimEnvironment` in environment definitions based on `minted` environments.

v2.1 (2015/09/09)

- Changing the highlighting style now no longer involves re-highlighting code. Style may be changed with almost no overhead.
- Improved control of automatic line breaks. New option `breakanywhere` allows line breaks anywhere when `breaklines=true`. The pre-break and post-break symbols for these types of breaks may be set with `breakanywheresymbolpre` and `breakanywheresymbolpost` (#79). New option `breakafter` allows specifying characters after which line breaks are allowed. Breaks between adjacent, identical characters may be controlled with `breakaftergroup`. The pre-break and post-break symbols for these types of breaks may be set with `breakaftersymbolpre` and `breakaftersymbolpost`.
- `breakbytoken` now only breaks lines between tokens that are separated by spaces, matching the documentation. The new option `breakbytokenanywhere` allows for breaking between tokens that are immediately adjacent. Fixed a bug in `\mintinline` that produced a following linebreak when `\mintinline` was the first thing in a paragraph and `breakbytoken` was true (#77).
- Fixed a bug in draft mode option handling for `\inputminted` (#75).
- Fixed a bug with `\MintedPygmentize` when a custom `pygmentize` was specified and there was no `pygmentize` on the default path (#62).
- Added note to docs on caching large numbers of code blocks under OS X (#78).
- Added discussion of current limitations of `texcomments` (#66) and `escapeinside` (#70).
- PGF/TikZ externalization is automatically detected and supported (#73).
- The package is now compatible with L^AT_EX files whose names contain spaces (#85).

v2.0 (2015/01/31)

- Added the compatibility package `minted1`, which provides the `minted` 1.7 code. This may be loaded when 1.7 compatibility is required. This package works with other packages that `\RequirePackage{minted}`, so long as it is loaded first.
- Moved all old `\changes` into `changelog`.

Development releases for 2.0 (2014–January 2015)

- Caching is now on by default.
- Fixed a bug that prevented compiling under Windows when file names contained commas.

- Added `breaksymbolleft`, `breaksymbolsepleft`, `breaksymbolindentleft`, `breaksymbolright`, `breaksymbolsepright`, and `breaksymbolindentright` options. `breaksymbol`, `breaksymbolsep`, and `breaksymbolindent` are now aliases for the correspondent `*left` options.
- Added `kpsewhich` package option. This uses `kpsewhich` to locate the files that are to be highlighted. This provides compatibility with build tools like `texi2pdf` that function by modifying `TEXINPUTS` (#25).
- Fixed a bug that prevented `\inputminted` from working with `outdir`.
- Added informative error messages when Pygments output is missing.
- Added `final` package option (opposite of `draft`).
- Renamed the default cache directory to `_minted-<jobname>` (replaced leading period with underscore). The leading period caused the cache directory to be hidden on many systems, which was a potential source of confusion.
- `breaklines` and `breakbytoken` now work with `\mintinline` (#31).
- `bgcolor` may now be set through `\setminted` and `\setmintedinline`.
- When math is enabled via `texcomments`, `mathescape`, or `escapeinside`, space characters now behave as in normal math by vanishing, instead of appearing as literal spaces. Math need no longer be specially formatted to avoid undesired spaces.
- In default value of `\listoflistingscaption`, capitalized “Listings” so that capitalization is consistent with default values for other lists (figures, tables, algorithms, etc.).
- Added `newfloat` package option that creates the `listing` environment using `newfloat` rather than `float`, thus providing better compatibility with the `caption` package (#12).
- Added support for Pygments option `stripall`.
- Added `breakbytoken` option that prevents `breaklines` from breaking lines within Pygments tokens.
- `\mintinline` uses a `\colorbox` when `bgcolor` is set, to give more reasonable behavior (#57).
- For PHP, `\mintinline` automatically begins with `startinline=true` (#23).
- Fixed a bug that threw off line numbering in `minted` when `langlinenos=false` and `firstnumber=last`. Fixed a bug in `\mintinline` that threw off subsequent line numbering when `langlinenos=false` and `firstnumber=last`.
- Improved behavior of `\mint` and `\mintinline` in `draft` mode.
- The `\mint` command now has the additional capability to take code delimited by paired curly braces `{}`.

- It is now possible to set options only for `\mintinline` using the new `\setmintedinline` command. Inline options override options specified via `\setminted`.
- Completely rewrote option handling. `fancyvrb` options are now handled on the L^AT_EX side directly, rather than being passed to Pygments and then returned. This makes caching more efficient, since code is no longer rehighlighted just because `fancyvrb` options changed.
- Fixed buffer size error caused by using `cache` with a very large number of files (#61).
- Fixed `autogobble` bug that caused failure under some operating systems.
- Added support for `escapeinside` (requires Pygments 2.0+; #38).
- Fixed issues with XeTeX and caching (#40).
- The `upquote` package now works correctly with single quotes when using Pygments 1.6+ (#34).
- Fixed caching incompatibility with Linux and OS X under `xelatex` (#18 and #42).
- Fixed `autogobble` incompatibility with Linux and OS X.
- `\mintinline` and derived commands are now robust, via `\newrobustcmd` from `etoolbox`.
- Unused styles are now cleaned up when caching.
- Fixed a bug that could interfere with caching (#24).
- Added `draft` package option (#39). This typesets all code using `fancyvrb`; Pygments is not used. This trades syntax highlighting for maximum speed in compiling.
- Added automatic line breaking with `breaklines` and related options (#1).
- Fixed a bug with boolean options that needed a `False` argument to cooperate with `\setminted` (#48).

v2.0-alpha3 (2013/12/21)

- Added `autogobble` option. This sends code through Python's `textwrap.dedent()` to remove common leading whitespace.
- Added package option `cachedir`. This allows the directory in which cached content is saved to be specified.
- Added package option `outputdir`. This allows an output directory for temporary files to be specified, so that the package can work with LaTeX's `-output-directory` command-line option.
- The `kvoptions` package is now required. It is needed to process key-value package options, such as the new `cachedir` option.

- Many small improvements, including better handling of paths under Windows and improved key system.

v2.0-alpha2 (2013/08/21)

- `\DeleteFile` now only deletes files if they do indeed exist. This eliminates warning messages due to missing files.
- Fixed a bug in the definition of `\DeleteFile` for non-Windows systems.
- Added support for Pygments option `stripnl`.
- Settings macros that were previously defined globally are now defined locally, so that `\setminted` may be confined by `\begin{group}...\end{group}` as expected.
- Macro definitions for a given style are now loaded only once per document, rather than once per command/environment. This works even without caching.
- A custom script/executable may now be substituted for `pygmentize` by redefining `\MintedPygmentize`.

v2.0alpha (2013/07/30)

- Added the package option `cache`. This significantly increases compilation speed by caching old output. For example, compiling the documentation is around 5x faster.
- New inline command `\mintinline`. Custom versions can be created via `\newmintinline`. The command works inside other commands (for example, footnotes) in most situations, so long as the percent and hash characters are avoided.
- The new `\setminted` command allows options to be specified at the document and language levels.
- All extended characters (Unicode, etc.) supported by `inputenc` now work under the pdfTeX engine. This involved using `\detokenize` on everything prior to saving.
- New package option `langlinenos` allows line numbering to pick up where it left off for a given language when `firstnumber=last`.
- New options, including `style`, `encoding`, `outencoding`, `codetagify`, `keywordcase`, `texcomments` (same as `texcl`), `python3` (for the `PythonConsoleLexer`), and `numbers`.
- `\usemintedstyle` now takes an optional argument to specify the style for a particular language, and works anywhere in the document.
- `xcolor` is only loaded if `color` isn't, preventing potential package clashes.

1.7 (2011/09/17)

- Options for float placement added [2011/09/12]
- Fixed `tabsize` option [2011/08/30]
- More robust detection of the `-shell-escape` option [2011/01/21]
- Added the `label` option [2011/01/04]
- Installation instructions added [2010/03/16]
- Minimal working example added [2010/03/16]
- Added PHP-specific options [2010/03/14]
- Removed unportable flag from Unix shell command [2010/02/16]

1.6 (2010/01/31)

- Added font-related options [2010/01/27]
- Windows support added [2010/01/27]
- Added command shortcuts [2010/01/22]
- Simpler versioning scheme [2010/01/22]

0.1.5 (2010/01/13)

- Added `fillcolor` option [2010/01/10]
- Added float support [2010/01/10]
- Fixed `firstnumber` option [2010/01/10]
- Removed `caption` option [2010/01/10]

0.0.4 (2010/01/08)

- Initial version [2010/01/08]

9 Implementation

9.1 Required packages

Load required packages. For compatibility reasons, most old functionality should be supported with the original set of packages. More recently added packages, such as `etoolbox` and `xstring`, should only be used for new features when possible. `shellesc` must be loaded before any packages that invoke `\write18`, since it is possible that they haven't yet been patched to work with LuaTeX 0.87+.

```

1 \RequirePackage{keyval}
2 \RequirePackage{kvoptions}
3 \RequirePackage{fancyvrb}
4 \RequirePackage{float}
5 \RequirePackage{ifthen}
6 \RequirePackage{calc}

```

```

7 \IfFileExists{shellesc.sty}
8 {\RequirePackage{shellesc}
9  \@ifpackagelater{shellesc}{2016/04/29}
10   {}
11   {\protected\def\ShellEscape{\immediate\write18 }}}
12 {\protected\def\ShellEscape{\immediate\write18 }}
13 \RequirePackage{ifplatform}
14 \RequirePackage{pdftexcmds}
15 \RequirePackage{etoolbox}
16 \RequirePackage{xstring}
17 \RequirePackage{lineno}
18 \RequirePackage{framed}

```

Make sure that either `color` or `xcolor` is loaded by the beginning of the document.

```

19 \AtBeginDocument{%
20   \@ifpackageloaded{color}{}{%
21     \@ifpackageloaded{xcolor}{}{\RequirePackage{xcolor}}}%
22 }

```

9.2 Package options

`\minted@float@within` Define an option that controls the section numbering of the listing float.

```

23 \DeclareVoidOption{chapter}{\def\minted@float@within{chapter}}
24 \DeclareVoidOption{section}{\def\minted@float@within{section}}

```

`newfloat` Define an option to use `newfloat` rather than `float` to create a floated listing environment.

```

25 \DeclareBoolOption{newfloat}

```

`cache` Define an option that determines whether highlighted content is cached. We use a boolean to keep track of its state.

```

26 \DeclareBoolOption[true]{cache}

```

`\minted@jobname` At various points, temporary files and directories will need to be named after the main `.tex` file. The typical way to do this is to use `\jobname`. However, if the file name contains spaces, then `\jobname` will contain the name wrapped in quotes (older versions of MiKTeX replace spaces with asterisks instead, and XeTeX apparently [allows double quotes within file names](#), in which case names are wrapped in single quotes). While that is perfectly fine for working with L^AT_EX internally, it causes problems with `\write18`, since quotes will end up in unwanted locations in shell commands. It would be possible to strip the wrapping quotation marks when they are present, and maintain any spaces in the file name. But it is

simplest to create a “sanitized” version of `\jobname` in which spaces and asterisks are replaced by underscores, and double quotes are stripped.

```
27 \StrSubstitute{\jobname}{ }{_}[\minted@jobname]
28 \StrSubstitute{\minted@jobname}{*}{_}[\minted@jobname]
29 \StrSubstitute{\minted@jobname}{"}{}[\minted@jobname]
```

`\minted@cachedir` Set the directory in which cached content is saved. The default uses a minted- prefix followed by the sanitized `\minted@jobname`.

```
30 \newcommand{\minted@cachedir}{\detokenize{_}minted-\minted@jobname}
31 \let\minted@cachedir@windows\minted@cachedir
32 \define@key{minted}{cachedir}{%
33   \@namedef{minted@cachedir}{#1}%
34   \StrSubstitute{\minted@cachedir}{/}{\@backslashchar}[\minted@cachedir@windows]}
```

`finalizcache` Define an option that switches the naming of cache files from an MD5-based system to a `listing<number>` scheme. Compiling with this option is a prerequisite to turning on `frozenccache`.

```
35 \DeclareBoolOption{finalizcache}
```

`frozenccache` Define an option that uses a fixed set of cache files, using `listing<number>` file naming with `\write18` disabled. This is convenient for working with a document in an environment in which `\write18` support is disabled and `minted` content does not need to be modified.

```
36 \DeclareBoolOption{frozenccache}
```

`\minted@outputdir` The `-output-directory` command-line option for `LATEX` causes problems for `minted`, because the `minted` temporary files are saved in the output directory, but `minted` still looks for them in the document root directory. There is no way to access the value of the command-line option. But it is possible to allow the output directory to be specified manually as a package option. A trailing slash is automatically appended to the `outputdir`, so that it may be directly joined to `cachedir`. This may be redundant if the user-supplied value already ends with a slash, but doubled slashes are ignored under `*nix` and Windows, so it isn’t a problem.

```
37 \let\minted@outputdir\@empty
38 \let\minted@outputdir@windows\@empty
39 \define@key{minted}{outputdir}{%
40   \@namedef{minted@outputdir}{#1/}%
41   \StrSubstitute{\minted@outputdir}{/}{%
42     {\@backslashchar}[\minted@outputdir@windows]}
```

`kpsewhich` Define an option that invokes `kpsewhich` to locate the files that are to be pygmentized. This isn't done by default to avoid the extra overhead, but can be useful with some build tools such as `texi2pdf` that rely on modifying `TEXINPUTS`.

```
43 \DeclareBoolOption{kpsewhich}
```

`langlinenos` Define an option that makes all minted environments and `\mint` commands for a given language share cumulative line numbering (if `firstnumber=last`).

```
44 \DeclareBoolOption{langlinenos}
```

`draft` Define an option that allows `fancyvrb` to do all typesetting directly, without using Pygments. This trades syntax highlighting for speed. Note that in many cases, the difference in performance between caching and draft mode will be minimal. Also note that draft settings may be inherited from the document class.

```
45 \DeclareBoolOption{draft}
```

`final` Define a final option that is the opposite of `draft`, since many packages do this.

```
46 \DeclareComplementaryOption{final}{draft}
```

Process package options. Proceed with everything that immediately relies upon them. If PGF/TikZ externalization is in use, switch on `draft` mode and turn off cache. Externalization involves compiling the *entire* document; all parts not related to the current image are “silently thrown away.” `minted` needs to cooperate with that by not writing any temp files or creating any directories. Two checks are done for externalization. The first, using `\tikzifexternalizing`, works if externalization is set before `minted` is loaded. The second, using `\tikzexternalrealjob`, works if externalization is set after `minted` is loaded.

```
47 \ProcessKeyvalOptions*
48 \ifthenelse{\boolean{minted@newfloat}}{\RequirePackage{newfloat}}{}
49 \ifcsname tikzifexternalizing\endcsname
50   \tikzifexternalizing{\minted@drafttrue\minted@cachefalse}{}
51 \else
52   \ifcsname tikzexternalrealjob\endcsname
53     \minted@drafttrue
54     \minted@cachefalse
55   \else
56     \fi
57 \fi
58 \ifthenelse{\boolean{minted@finalizcache}}{%
59   {\ifthenelse{\boolean{minted@frozenscache}}{%
60     {\PackageError{minted}%
61       {Options "finalizcache" and "frozenscache" are not compatible}%
62       {Options "finalizcache" and "frozenscache" are not compatible}}%
63     {}}%
64 }
```



```

64 {}
65 \ifthenelse{\boolean{minted@cache}}{%
66   {\ifthenelse{\boolean{minted@frozenscache}}{%
67     {}%
68     {\AtEndOfPackage{\ProvideDirectory{\minted@outputdir\minted@cachedir}}}}}%
69 {}

```

9.3 Input, caching, and temp files

`\minted@input` We need a wrapper for `\input`. In most cases, `\input` failure will be due to attempts to use `\inputminted` with files that don't exist, but we also want to give informative error messages when `outputdir` is needed or incompatible build tools are used.

```

70 \newcommand{\minted@input}[1]{%
71   \IfFileExists{#1}%
72   {\input{#1}}%
73   {\PackageError{minted}{Missing Pygments output; \string\inputminted\space
74     was^^Jprobably given a file that does not exist--otherwise, you may need
75     ^^Jthe outputdir package option, or may be using an incompatible build
76     tool\ifwindows,^^Jor may be using the kpsewhich option without having
77     PowerShell installed\fi,^^Jor may be using frozenscache with a missing file}%
78   {This could be caused by using -output-directory or -aux-directory
79     ^^Jwithout setting minted's outputdir, or by using a build tool that
80     ^^Jchanges paths in ways minted cannot detect\ifwindows, or by using the
81     ^^Jkpsewhich option without PowerShell\fi,
82     ^^Jor using frozenscache with a missing file.}}%
83 }

```

`\minted@infile` Define a default name for files of highlighted content that are brought in. Caching will redefine this. We start out with the default, non-caching value.

```

84 \newcommand{\minted@infile}{\minted@jobname.out.pyg}

```

We need a way to track the cache files that are created, and delete those that are not in use. This is accomplished by creating a comma-delimited list of cache files and saving this list to the `.aux` file so that it may be accessed on subsequent runs. During subsequent runs, this list is compared against the cache files that are actually used, and unused files are deleted. Cache file names are created with MD5 hashes of highlighting settings and file contents, with a `.pygtex` extension, so they never contain commas. Thus comma-delimiting the list of file names doesn't introduce a potential for errors.

`\minted@cachelist` This is a list of the current cache files.

```

85 \newcommand{\minted@cachelist}{}

```

`\minted@addcachefile` This adds a file to the list of cache files. It also creates a macro involving the hash, so that the current usage of the hash can be easily checked by seeing if the macro exists. The list of cache files must be created with built-in linebreaks, so that when it is written to the .aux file, it won't all be on one line and thereby risk buffer errors.

```

86 \newcommand{\minted@addcachefile}[1]{%
87   \expandafter\long\expandafter\gdef\expandafter\minted@cachelist\expandafter{%
88     \minted@cachelist,^^J%
89     \space\space#1}%
90   \expandafter\gdef\csname minted@cached@#1\endcsname{}%
91 }

```

`\minted@savecachelist` We need to be able to save the list of cache files to the .aux file, so that we can reload it on the next run.

```

92 \newcommand{\minted@savecachelist}{%
93   \ifdefempty{\minted@cachelist}{}{}%
94   \immediate\write\@mainaux{%
95     \string\gdef\string\minted@oldcachelist\string{%
96       \minted@cachelist\string}}%
97   }%
98 }

```

`\minted@cleancache` Clean up old cache files that are no longer in use.

```

99 \newcommand{\minted@cleancache}{%
100   \ifcsname minted@oldcachelist\endcsname
101     \def\do##1{%
102       \ifthenelse{\equal{##1}{}}{}{}%
103       \ifcsname minted@cached@##1\endcsname\else
104         \DeleteFile[\minted@outputdir\minted@cachedir]{##1}%
105       \fi
106     }%
107   }%
108   \expandafter\docsvlist\expandafter{\minted@oldcachelist}%
109 \else
110 \fi
111 }

```

At the end of the document, save the list of cache files and clean the cache. If in draft mode, don't clean up the cache and save the old cache file list for next time. This allows draft mode to be switched on and off without requiring that all highlighted content be regenerated. The saving and cleaning operations may be called without conditionals, since their definitions already contain all necessary checks for their correct operation.

```

112 \ifthenelse{\boolean{minted@draft}}{}%

```

```

113 {\AtEndDocument{%
114     \ifcsname minted@oldcachelist\endcsname
115     \StrSubstitute{\minted@oldcachelist}{,}{,^^J }[\minted@cachelist]
116     \minted@savecachelist
117     \fi}}%
118 {\ifthenelse{\boolean{minted@frozensavecache}}{%
119     {\AtEndDocument{%
120         \ifcsname minted@oldcachelist\endcsname
121         \StrSubstitute{\minted@oldcachelist}{,}{,^^J }[\minted@cachelist]
122         \minted@savecachelist
123         \fi}}%
124     {\AtEndDocument{%
125         \minted@savecachelist
126         \minted@cleancache}}}%

```

9.4 OS interaction

We need system-dependent macros for communicating with the “outside world.”

`\DeleteFile` Delete a file. Define conditionally in case an equivalent macro has already been defined.

```

127 \ifwindows
128 \providecommand{\DeleteFile}[2][{}]{%
129     \ifthenelse{\equal{#1}{}}{%
130         {\IfFileExists{#2}{\ShellEscape{del #2}}{}}%
131         {\IfFileExists{#1/#2}{%
132             \StrSubstitute{#1}{/}{\@backslashchar}[\minted@windir]
133             \ShellEscape{del \minted@windir\@backslashchar #2}}{}}}%
134     \else
135     \providecommand{\DeleteFile}[2][{}]{%
136         \ifthenelse{\equal{#1}{}}{%
137             {\IfFileExists{#2}{\ShellEscape{rm #2}}{}}%
138             {\IfFileExists{#1/#2}{\ShellEscape{rm #1/#2}}{}}}%
139     \fi

```

`\ProvideDirectory` We need to be able to create a directory, if it doesn’t already exist. This is primarily for storing cached highlighted content.

```

140 \ifwindows
141 \newcommand{\ProvideDirectory}[1]{%
142     \StrSubstitute{#1}{/}{\@backslashchar}[\minted@windir]
143     \ShellEscape{if not exist \minted@windir\space mkdir \minted@windir}}
144 \else
145 \newcommand{\ProvideDirectory}[1]{%
146     \ShellEscape{mkdir -p #1}}
147 \fi

```

`\TestAppExists` Determine whether a given application exists.

Usage is a bit roundabout, but has been retained for backward compatibility. At some point, it may be worth replacing this with something using `@@input"<command>"`. That would require MiKTeX users to `--enable-pipes`, however, which would make things a little more complicated. If Windows XP compatibility is ever no longer required, the `where` command could be used instead of the approach for Windows.

To test whether an application exists, use the following code:

```
\TestAppExists{appname}
\ifthenelse{\boolean{AppExists}}{app exists}{app doesn't exist}

148 \newboolean{AppExists}
149 \newread\minted@appexistsfile
150 \newcommand{\TestAppExists}[1]{
151   \ifwindows
```

On Windows, we need to use path expansion and write the result to a file. If the application doesn't exist, the file will be empty (except for a newline); otherwise, it will contain the full path of the application.

```
152   \DeleteFile{\minted@jobname.aex}
153   \ShellEscape{for \string^\@percentchar i in (#1.exe #1.bat #1.cmd)
154     do set > \minted@jobname.aex <nul: /p
155     x=\string^\@percentchar \string~$PATH:i>> \minted@jobname.aex}
156   %$ <- balance syntax highlighting
157   \immediate\openin\minted@appexistsfile\minted@jobname.aex
158   \expandafter\def\expandafter\@tmp@cr\expandafter{\the\endlinechar}
159   \endlinechar=-1\relax
160   \readline\minted@appexistsfile to \minted@apppathifexists
161   \endlinechar=\@tmp@cr
162   \ifthenelse{\equal{\minted@apppathifexists}{}}
163     {\AppExistsfalse}
164     {\AppExiststrue}
165   \immediate\closein\minted@appexistsfile
166   \DeleteFile{\minted@jobname.aex}
167   \else
```

On Unix-like systems, we do a straightforward which test and create a file upon success, whose existence we can then check.

```
168   \ShellEscape{which #1 && touch \minted@jobname.aex}
169   \IfFileExists{\minted@jobname.aex}
170     {\AppExiststrue
171       \DeleteFile{\minted@jobname.aex}}
172     {\AppExistsfalse}
173   \fi
174 }
```

9.5 Option processing

Option processing is somewhat involved, because we want to be able to define options at various levels of hierarchy: individual command/environment, language, global (document). And once those options are defined, we need to go through the hierarchy in a defined order of precedence to determine which option to apply. As if that wasn't complicated enough, some options need to be sent to Pygments, some need to be sent to `fancyvrb`, and some need to be processed within `minted` itself.

To begin with, we need macros for storing lists of options that will later be passed via the command line to Pygments (`optlistcl`). These are defined at the global (`cl@g`), language (`cl@lang`), and command or environment (`cl@cmd`) levels, so that settings can be specified at various levels of hierarchy. The language macro is actually a placeholder. The current language will be tracked using `\minted@lang`. Each individual language will create a `\minted@optlistcl@lang<language>` macro. `\minted@optlistcl@lang` may be `\let` to this macro as convenient; otherwise, the general language macro merely serves as a placeholder.

The global- and language-level lists also have an `inline (i)` variant. This allows different settings to be applied in inline settings. An inline variant is not needed at the command/environment level, since at that level settings would not be present unless they were supposed to be applied.

```
\minted@optlistcl@g
175 \newcommand{\minted@optlistcl@g}{}

\minted@optlistcl@g@i
176 \newcommand{\minted@optlistcl@g@i}{}

\minted@lang
177 \let\minted@lang\@empty

\minted@optlistcl@lang
178 \newcommand{\minted@optlistcl@lang}{}

\minted@optlistcl@lang@i
179 \newcommand{\minted@optlistcl@lang@i}{}

\minted@optlistcl@cmd
180 \newcommand{\minted@optlistcl@cmd}{}

```

We also need macros for storing lists of options that will later be passed to `fancyvrb` (`optlistfv`). As before, these exist at the global (`fv@g`), language (`fv@lang`), and command or environment (`fv@cmd`) levels. Pygments accepts `fancyvrb` options, but in almost all cases, these options may be applied via `\fvset` rather than via running Pygments. This is significantly more efficient when caching is turned on, since it allows formatting changes to be applied without having to re-highlight the code.

```
\minted@optlistfv@g
```

```
181 \newcommand{\minted@optlistfv@g}{}{}

```

```
\minted@optlistfv@g@i
```

```
182 \newcommand{\minted@optlistfv@g@i}{}{}

```

```
\minted@optlistfv@lang
```

```
183 \newcommand{\minted@optlistfv@lang}{}{}

```

```
\minted@optlistfv@lang@i
```

```
184 \newcommand{\minted@optlistfv@lang@i}{}{}

```

```
\minted@optlistfv@cmd
```

```
185 \newcommand{\minted@optlistfv@cmd}{}{}

```

```
\minted@configlang
```

We need a way to check whether a language has had all its option list macros created. This generally occurs in a context where `\minted@lang` needs to be set. So we create a macro that does both at once. If the language list macros do not exist, we create them globally to simplify future operations.

```
186 \newcommand{\minted@configlang}[1]{%
187   \def\minted@lang{#1}%
188   \ifcsname minted@optlistcl@lang\minted@lang\endcsname\else
189     \expandafter\gdef\csname minted@optlistcl@lang\minted@lang\endcsname{}%
190   \fi
191   \ifcsname minted@optlistcl@lang\minted@lang @i\endcsname\else
192     \expandafter\gdef\csname minted@optlistcl@lang\minted@lang @i\endcsname{}%
193   \fi
194   \ifcsname minted@optlistfv@lang\minted@lang\endcsname\else
195     \expandafter\gdef\csname minted@optlistfv@lang\minted@lang\endcsname{}%
196   \fi
197   \ifcsname minted@optlistfv@lang\minted@lang @i\endcsname\else
198     \expandafter\gdef\csname minted@optlistfv@lang\minted@lang @i\endcsname{}%
199   \fi
200 }
```

We need a way to define options in bulk at the global, language, and command levels. How this is done will depend on the type of option. The keys created are grouped by level: `\minted@opt@g`, `\minted@opt@lang`, and `\minted@opt@cmd`, plus inline variants. The language-level key groupings use `\minted@lang` internally, so we don't need to duplicate the internals for different languages. The key groupings are independent of whether a given option relates to `Pygments`, `fancyvrb`, etc. Organization by level is the only thing that is important here, since keys are applied in a hierarchical fashion. Key values are stored in macros of the form `\minted@opt@<level>:(key)`, so that they may be retrieved later. In practice, these key macros will generally not be used directly (hence the colon in the name). Rather, the hierarchy of macros will be traversed until an existing macro is found.

`\minted@def@optcl` Define a generic option that will be passed to the command line. Options are given in a `{key}{value}` format that is transformed into `key=value` and then passed to `pygmentize`. This allows `value` to be easily stored in a separate macro for later access. This is useful, for example, in separately accessing the value of `encoding` for performing `autogobble`.

If a key option is specified without `=value`, the default is assumed. Options are automatically created at all levels.

Options are added to the option lists in such a way that they will be detokenized. This is necessary since they will ultimately be used in `\write18`.

```

201 \newcommand{\minted@addto@optlistcl}[2]{%
202   \expandafter\def\expandafter#1\expandafter{#1%
203     \detokenize{#2}\space}}
204 \newcommand{\minted@addto@optlistcl@lang}[2]{%
205   \expandafter\let\expandafter\minted@tmp\csname #1\endcsname
206   \expandafter\def\expandafter\minted@tmp\expandafter{\minted@tmp%
207     \detokenize{#2}\space}%
208   \expandafter\let\csname #1\endcsname\minted@tmp}
209 \newcommand{\minted@def@optcl}[4][{}]{%
210   \ifthenelse{\equal{#1}{}}{%
211     {\define@key{\minted@opt@g}{#2}{%
212       \minted@addto@optlistcl{\minted@optlistcl@g}{#3=#4}%
213       \@namedef{\minted@opt@g:#2}{#4}}}%
214     {\define@key{\minted@opt@g@i}{#2}{%
215       \minted@addto@optlistcl{\minted@optlistcl@g@i}{#3=#4}%
216       \@namedef{\minted@opt@g@i:#2}{#4}}}%
217     {\define@key{\minted@opt@lang}{#2}{%
218       \minted@addto@optlistcl@lang{\minted@optlistcl@lang\minted@lang}{#3=#4}%
219       \@namedef{\minted@opt@lang\minted@lang:#2}{#4}}}%
220     {\define@key{\minted@opt@lang@i}{#2}{%
221       \minted@addto@optlistcl@lang{%
222         \minted@optlistcl@lang\minted@lang @i}{#3=#4}%
223       \@namedef{\minted@opt@lang\minted@lang @i:#2}{#4}}}%
224     {\define@key{\minted@opt@cmd}{#2}{%
225       \minted@addto@optlistcl{\minted@optlistcl@cmd}{#3=#4}%

```

```

226     \@namedef{minted@opt@cmd:#2}{#4}}}%
227 {\define@key{minted@opt@g}{#2}[#1]{%
228     \minted@addto@optlistcl{\minted@optlistcl@g}{#3=#4}%
229     \@namedef{minted@opt@g:#2}{#4}}}%
230 \define@key{minted@opt@g@i}{#2}[#1]{%
231     \minted@addto@optlistcl{\minted@optlistcl@g@i}{#3=#4}%
232     \@namedef{minted@opt@g@i:#2}{#4}}}%
233 \define@key{minted@opt@lang}{#2}[#1]{%
234     \minted@addto@optlistcl@lang{minted@optlistcl@lang\minted@lang}{#3=#4}%
235     \@namedef{minted@opt@lang\minted@lang:#2}{#4}}}%
236 \define@key{minted@opt@lang@i}{#2}[#1]{%
237     \minted@addto@optlistcl@lang{%
238         minted@optlistcl@lang\minted@lang @i}{#3=#4}%
239     \@namedef{minted@opt@lang\minted@lang @i:#2}{#4}}}%
240 \define@key{minted@opt@cmd}{#2}[#1]{%
241     \minted@addto@optlistcl{\minted@optlistcl@cmd}{#3=#4}%
242     \@namedef{minted@opt@cmd:#2}{#4}}}%
243 }

```

This covers the typical options that must be passed to Pygments. But some, particularly `escapeinside`, need more work. Since their arguments may contain escaped characters, expansion rather than detokenization is needed. Getting expansion to work as desired in a `\write18` context requires the redefinition of some characters.

`\minted@escchars` We need to define versions of common escaped characters that will work correctly under expansion for use in `\write18`.

```

244 \edef\minted@hashchar{\string#}
245 \edef\minted@dollarchar{\string$}
246 \edef\minted@ampchar{\string&}
247 \edef\minted@underscorechar{\string_}
248 \edef\minted@tildechar{\string~}
249 \edef\minted@leftsquarebracket{\string[}
250 \edef\minted@rightsquarebracket{\string]}
251 \newcommand{\minted@escchars}{%
252     \let\#\minted@hashchar
253     \let\%\minted@percentchar
254     \let\{\minted@charlb
255     \let\}\minted@charrb
256     \let\$ \minted@dollarchar
257     \let\& \minted@ampchar
258     \let\_ \minted@underscorechar
259     \let\\ \minted@backslashchar
260     \let~ \minted@tildechar
261     \let~ \minted@tildechar
262     \let\[ \minted@leftsquarebracket
263     \let\] \minted@rightsquarebracket
264 } %$ <- highlighting

```


`\minted@def@optcl@e` Now to define options that are expanded.

```

265 \newcommand{\minted@addto@optlistcl@e}[2]{%
266   \begingroup
267   \minted@escchars
268   \xdef\minted@xtmp{#2}%
269   \endgroup
270   \expandafter\minted@addto@optlistcl@e@i\expandafter{\minted@xtmp}{#1}}
271 \def\minted@addto@optlistcl@e@i#1#2{%
272   \expandafter\def\expandafter#2\expandafter{#2#1\space}}
273 \newcommand{\minted@addto@optlistcl@lang@e}[2]{%
274   \begingroup
275   \minted@escchars
276   \xdef\minted@xtmp{#2}%
277   \endgroup
278   \expandafter\minted@addto@optlistcl@lang@e@i\expandafter{\minted@xtmp}{#1}}
279 \def\minted@addto@optlistcl@lang@e@i#1#2{%
280   \expandafter\let\expandafter\minted@tmp\csname #2\endcsname
281   \expandafter\def\expandafter\minted@tmp\expandafter{\minted@tmp#1\space}%
282   \expandafter\let\csname #2\endcsname\minted@tmp}
283 \newcommand{\minted@def@optcl@e}[4][{}]{%
284   \ifthenelse{\equal{#1}{}}{%
285     {\define@key{minted@opt@g}{#2}{%
286       \minted@addto@optlistcl@e{\minted@optlistcl@g}{#3=#4}%
287       \@namedef{minted@opt@g:#2}{#4}}}%
288     \define@key{minted@opt@g@i}{#2}{%
289       \minted@addto@optlistcl@e{\minted@optlistcl@g@i}{#3=#4}%
290       \@namedef{minted@opt@g@i:#2}{#4}}}%
291     \define@key{minted@opt@lang}{#2}{%
292       \minted@addto@optlistcl@lang@e{\minted@optlistcl@lang\minted@lang}{#3=#4}%
293       \@namedef{minted@opt@lang\minted@lang:#2}{#4}}}%
294     \define@key{minted@opt@lang@i}{#2}{%
295       \minted@addto@optlistcl@lang@e{
296         minted@optlistcl@lang\minted@lang @i}{#3=#4}%
297       \@namedef{minted@opt@lang\minted@lang @i:#2}{#4}}}%
298     \define@key{minted@opt@cmd}{#2}{%
299       \minted@addto@optlistcl@e{\minted@optlistcl@cmd}{#3=#4}%
300       \@namedef{minted@opt@cmd:#2}{#4}}}%
301   {\define@key{minted@opt@g}{#2}[#1]{%
302     \minted@addto@optlistcl@e{\minted@optlistcl@g}{#3=#4}%
303     \@namedef{minted@opt@g:#2}{#4}}}%
304     \define@key{minted@opt@g@i}{#2}[#1]{%
305       \minted@addto@optlistcl@e{\minted@optlistcl@g@i}{#3=#4}%
306       \@namedef{minted@opt@g@i:#2}{#4}}}%
307     \define@key{minted@opt@lang}{#2}[#1]{%
308       \minted@addto@optlistcl@lang@e{\minted@optlistcl@lang\minted@lang}{#3=#4}%
309       \@namedef{minted@opt@lang\minted@lang:#2}{#4}}}%
310     \define@key{minted@opt@lang@i}{#2}[#1]{%
311       \minted@addto@optlistcl@lang@e{
312         minted@optlistcl@lang\minted@lang @i}{#3=#4}%

```

```

313 \namedef{minted@opt@lang\minted@lang @i:#2}{#4}}%
314 \define@key{minted@opt@cmd}{#2}[#1]{%
315 \minted@addto@optlistcl@e{\minted@optlistcl@cmd}{#3=#4}%
316 \namedef{minted@opt@cmd:#2}{#4}}}%
317 }

```

`\minted@def@optcl@switch` Define a switch or boolean option that is passed to Pygments, which is true when no value is specified.

```

318 \newcommand{\minted@def@optcl@switch}[2]{%
319 \define@booleankey{minted@opt@g}{#1}%
320 {\minted@addto@optlistcl{\minted@optlistcl@g}{#2=True}%
321 \namedef{minted@opt@g:#1}{true}}
322 {\minted@addto@optlistcl{\minted@optlistcl@g}{#2=False}%
323 \namedef{minted@opt@g:#1}{false}}
324 \define@booleankey{minted@opt@g@i}{#1}%
325 {\minted@addto@optlistcl{\minted@optlistcl@g@i}{#2=True}%
326 \namedef{minted@opt@g@i:#1}{true}}
327 {\minted@addto@optlistcl{\minted@optlistcl@g@i}{#2=False}%
328 \namedef{minted@opt@g@i:#1}{false}}
329 \define@booleankey{minted@opt@lang}{#1}%
330 {\minted@addto@optlistcl@lang{\minted@optlistcl@lang\minted@lang}{#2=True}%
331 \namedef{minted@opt@lang\minted@lang:#1}{true}}
332 {\minted@addto@optlistcl@lang{\minted@optlistcl@lang\minted@lang}{#2=False}%
333 \namedef{minted@opt@lang\minted@lang:#1}{false}}
334 \define@booleankey{minted@opt@lang@i}{#1}%
335 {\minted@addto@optlistcl@lang{\minted@optlistcl@lang\minted@lang @i}{#2=True}%
336 \namedef{minted@opt@lang\minted@lang @i:#1}{true}}
337 {\minted@addto@optlistcl@lang{\minted@optlistcl@lang\minted@lang @i}{#2=False}%
338 \namedef{minted@opt@lang\minted@lang @i:#1}{false}}
339 \define@booleankey{minted@opt@cmd}{#1}%
340 {\minted@addto@optlistcl{\minted@optlistcl@cmd}{#2=True}%
341 \namedef{minted@opt@cmd:#1}{true}}
342 {\minted@addto@optlistcl{\minted@optlistcl@cmd}{#2=False}%
343 \namedef{minted@opt@cmd:#1}{false}}
344 }

```

Now that all the machinery for Pygments options is in place, we can move on to `fancyvrb` options.

`\minted@def@optfv` Define `fancyvrb` options.

```

345 \newcommand{\minted@def@optfv}[1]{%
346 \define@key{minted@opt@g}{#1}{%
347 \expandafter\def\expandafter\minted@optlistfv@g\expandafter{%
348 \minted@optlistfv@g#1=##1,}%
349 \namedef{minted@opt@g:#1}{##1}}
350 \define@key{minted@opt@g@i}{#1}{%
351 \expandafter\def\expandafter\minted@optlistfv@g@i\expandafter{%

```

```

352 \minted@optlistfv@g@i#1=##1,}%
353 \@namedef{minted@opt@g@i:#1}{##1}}
354 \define@key{minted@opt@lang}{#1}{%
355 \expandafter\let\expandafter\minted@tmp%
356 \csname minted@optlistfv@lang\minted@lang\endcsname
357 \expandafter\def\expandafter\minted@tmp\expandafter{%
358 \minted@tmp#1=##1,}%
359 \expandafter\let\csname minted@optlistfv@lang\minted@lang\endcsname%
360 \minted@tmp
361 \@namedef{minted@opt@lang\minted@lang:#1}{##1}}
362 \define@key{minted@opt@lang@i}{#1}{%
363 \expandafter\let\expandafter\minted@tmp%
364 \csname minted@optlistfv@lang\minted@lang @i\endcsname
365 \expandafter\def\expandafter\minted@tmp\expandafter{%
366 \minted@tmp#1=##1,}%
367 \expandafter\let\csname minted@optlistfv@lang\minted@lang @i\endcsname%
368 \minted@tmp
369 \@namedef{minted@opt@lang\minted@lang @i:#1}{##1}}
370 \define@key{minted@opt@cmd}{#1}{%
371 \expandafter\def\expandafter\minted@optlistfv@cmd\expandafter{%
372 \minted@optlistfv@cmd#1=##1,}%
373 \@namedef{minted@opt@cmd:#1}{##1}}
374 }

```

`\minted@def@optfv@switch` Define fancyvrb boolean options.

```

375 \newcommand{\minted@def@optfv@switch}[1]{%
376 \define@booleankey{minted@opt@g}{#1}%
377 {\expandafter\def\expandafter\minted@optlistfv@g\expandafter{%
378 \minted@optlistfv@g#1=true,}%
379 \@namedef{minted@opt@g:#1}{true}}%
380 {\expandafter\def\expandafter\minted@optlistfv@g\expandafter{%
381 \minted@optlistfv@g#1=false,}%
382 \@namedef{minted@opt@g:#1}{false}}%
383 \define@booleankey{minted@opt@g@i}{#1}%
384 {\expandafter\def\expandafter\minted@optlistfv@g@i\expandafter{%
385 \minted@optlistfv@g@i#1=true,}%
386 \@namedef{minted@opt@g@i:#1}{true}}%
387 {\expandafter\def\expandafter\minted@optlistfv@g@i\expandafter{%
388 \minted@optlistfv@g@i#1=false,}%
389 \@namedef{minted@opt@g@i:#1}{false}}%
390 \define@booleankey{minted@opt@lang}{#1}%
391 {\expandafter\let\expandafter\minted@tmp%
392 \csname minted@optlistfv@lang\minted@lang\endcsname
393 \expandafter\def\expandafter\minted@tmp\expandafter{%
394 \minted@tmp#1=true,}%
395 \expandafter\let\csname minted@optlistfv@lang\minted@lang\endcsname%
396 \minted@tmp
397 \@namedef{minted@opt@lang\minted@lang:#1}{true}}%
398 {\expandafter\let\expandafter\minted@tmp%

```

```

399     \csname minted@optlistfv@lang\minted@lang\endcsname
400     \expandafter\def\expandafter\minted@tmp\expandafter{%
401       \minted@tmp#1=false,}%
402     \expandafter\let\csname minted@optlistfv@lang\minted@lang\endcsname%
403       \minted@tmp
404     \@namedef{minted@opt@lang\minted@lang:#1}{false}}%
405 \define@booleankey{minted@opt@lang@i}{#1}%
406 { \expandafter\let\expandafter\minted@tmp%
407   \csname minted@optlistfv@lang\minted@lang @i\endcsname
408   \expandafter\def\expandafter\minted@tmp\expandafter{%
409     \minted@tmp#1=true,}%
410   \expandafter\let\csname minted@optlistfv@lang\minted@lang @i\endcsname%
411     \minted@tmp
412   \@namedef{minted@opt@lang\minted@lang @i:#1}{true}}%
413 { \expandafter\let\expandafter\minted@tmp%
414   \csname minted@optlistfv@lang\minted@lang @i\endcsname
415   \expandafter\def\expandafter\minted@tmp\expandafter{%
416     \minted@tmp#1=false,}%
417   \expandafter\let\csname minted@optlistfv@lang\minted@lang @i\endcsname%
418     \minted@tmp
419   \@namedef{minted@opt@lang\minted@lang @i:#1}{false}}%
420 \define@booleankey{minted@opt@cmd}{#1}%
421 { \expandafter\def\expandafter\minted@optlistfv@cmd\expandafter{%
422   \minted@optlistfv@cmd#1=true,}%
423   \@namedef{minted@opt@cmd:#1}{true}}%
424 { \expandafter\def\expandafter\minted@optlistfv@cmd\expandafter{%
425   \minted@optlistfv@cmd#1=false,}%
426   \@namedef{minted@opt@cmd:#1}{false}}%
427 }

```

`minted@isinline` In resolving value precedence when actually using values, we need a way to determine whether we are in an inline context. This is accomplished via a boolean that is set at the beginning of inline commands.

```

428 \newboolean{minted@isinline}

```

`\minted@fvset` We will need a way to actually use the lists of stored `fancyvrb` options later on.

```

429 \newcommand{\minted@fvset}{%
430   \expandafter\fvset\expandafter{\minted@optlistfv@g}%
431   \expandafter\let\expandafter\minted@tmp%
432     \csname minted@optlistfv@lang\minted@lang\endcsname
433   \expandafter\fvset\expandafter{\minted@tmp}%
434   \ifthenelse{\boolean{minted@isinline}}{%
435     { \expandafter\fvset\expandafter{\minted@optlistfv@g@i}%
436       \expandafter\let\expandafter\minted@tmp%
437         \csname minted@optlistfv@lang\minted@lang @i\endcsname
438       \expandafter\fvset\expandafter{\minted@tmp}}%
439   }%

```

```

440 \expandafter\fvset\expandafter{\minted@optlistfv@cmd}%
441 }

```

We need a way to define `minted`-specific options at multiple levels of hierarchy, as well as a way to retrieve these options. As with previous types of options, values are stored in macros of the form `\minted@opt@<level>:<key>`, since they are not meant to be accessed directly.

The order of precedence is `cmd`, `lang@i`, `g@i`, `lang`, `g`. A value specified at the command or environment level should override other settings. In its absence, a value specified for an inline command should override other settings, if we are indeed in an inline context. Otherwise, language settings take precedence over global settings.

Before actually creating the option-definition macro, we need a few helper macros.

`\minted@def@opt` Finally, on to the actual option definitions for `minted`-specific options.

Usage: `\minted@def@opt[<initial global value>]{<key name>}`

```

442 \newcommand{\minted@def@opt}[2][{}]{%
443   \define@key{minted@opt@g}{#2}{%
444     \@namedef{minted@opt@g:#2}{##1}}
445   \define@key{minted@opt@g@i}{#2}{%
446     \@namedef{minted@opt@g@i:#2}{##1}}
447   \define@key{minted@opt@lang}{#2}{%
448     \@namedef{minted@opt@lang\minted@lang:#2}{##1}}
449   \define@key{minted@opt@lang@i}{#2}{%
450     \@namedef{minted@opt@lang\minted@lang @i:#2}{##1}}
451   \define@key{minted@opt@cmd}{#2}{%
452     \@namedef{minted@opt@cmd:#2}{##1}}
453   \ifstrempy{#1}{ }\@namedef{minted@opt@g:#2}{#1}}%
454 }

```

`\minted@checkstyle` Make sure that style macros exist.

We have to do some tricks with `\endlinechar` to prevent `\input` from inserting unwanted whitespace. That is primarily for inline commands, where it would introduce a line break. There is also the very unorthodox `\let\def\gdef` to make sure that macros are defined globally. The catcodes for `-` and `_` must be changed during macro definition to accomodate style names like `paraiso-light`, `paraiso-dark`, and `algol_nu`.

If a style is not given, then revert to the default style, but create macros with prefix `PYG`, and create `default-pyg-prefix.pygstyle` if caching is on. This allows a graceful fallback in the event that style is empty. It is also purposefully used to create a complete set of macros with prefix `PYG`, so that the symbol macros may be used, as described next.

The typical style macros created by `\minted@checkstyle`, which are of the form `\PYG<style>`, are used indirectly. All code is highlighted with `commandprefix=PYG`, so that it uses `\PYG`. Then `\PYG` is `\let` to `\PYG<style>` as appropriate. This way, code need not be highlighted again when the style is changed. This has the disadvantage that none of the `\PYG<symbol>` macros will be defined; rather, only `\PYG<style><symbol>` macros will be defined. It would be possible to `\let \PYG<symbol>` to `\PYG<style><symbol>`, but it is simpler to define a complete set of symbol macros using the `PYG` prefix, so that all symbol macros will be defined by default.⁶

Whenever `\minted@checkstyle` is invoked with a named style and style macros need to be created, there is a check to see if the `PYG` prefix macros have been created, and they are generated if they do not yet exist. This is important when `\MintedPygmentize` is used to call a custom `pygmentize`; we want to wait as late as possible to use `pygmentize`, so we don't want to generate the `\PYG` macros until the last possible moment.

It isn't necessary to set the initial style to default, because the current style is always obtained via `\minted@get@opt{style}{default}`, so default is always the fallback value and need not be set explicitly. `\minted@checkstyle` is used in each command/environment, so that using `pygmentize` can be delayed as long as possible.

```

455 \newcommand{\minted@checkstyle}[1]{%
456   \ifcsname minted@styleloaded@\ifstrempy{#1}{default-pyg-prefix}{#1}\endcsname\el
457   \ifstrempy{#1}{ }\ifcsname PYG\endcsname\else\minted@checkstyle{}\fi}%
458   \expandafter\gdef%
459   \csname minted@styleloaded@\ifstrempy{#1}{default-pyg-prefix}{#1}\endcsname{
460   \ifthenelse{\boolean{minted@cache}}{%
461     {\IfFileExists
462      {\minted@outputdir\minted@cachedir/\ifstrempy{#1}{default-pyg-prefix}{#1}.py
463      }%
464      {%
465       \ifthenelse{\boolean{minted@frozenscache}}{%
466         {\PackageError{minted}%
467          {Missing style definition for #1 with frozenscache}%
468          {Missing style definition for #1 with frozenscache}}%
469         {\ifwindows
470          \ShellEscape{%
471            \MintedPygmentize\space -S \ifstrempy{#1}{default}{#1} -f latex
472            -P commandprefix=PYG#1
473            > \minted@outputdir@windows\minted@cachedir@windows\@backslashchar%
474            \ifstrempy{#1}{default-pyg-prefix}{#1}.pygstyle}%
475          }
476        }
477      }
478   }

```

⁶It would be possible to hard-code the symbol macros in `minted` itself, but that would have the disadvantage of tying `minted` more closely to a particular version of `Pygments`. Similarly, `\letting` symbol macros assumes a complete, fixed list of symbol macros. The current approach is harder to break than these alternatives; the worst-case scenario should be needing to purge the cache, rather than dealing with an undefined macro.

```

476         \ShellEscape{%
477             \MintedPygmentize\space -S \ifstrempy{#1}{default}{#1} -f latex
478             -P commandprefix=PYG#1
479             > \minted@outputdir\minted@cachedir/%
480             \ifstrempy{#1}{default-pyg-prefix}{#1}.pygstyle}%
481         \fi}%
482     }%
483     \begingroup
484     \let\def\gdef
485     \catcode`\_ =11
486     \catcode`\- =11
487     \endlinechar=-1\relax
488     \minted@input{%
489         \minted@outputdir\minted@cachedir/\ifstrempy{#1}{default-pyg-prefix}{#1}
490     \endgroup
491     \minted@addcachefile{\ifstrempy{#1}{default-pyg-prefix}{#1}.pygstyle}}%
492 {%
493     \ifwindows
494         \ShellEscape{%
495             \MintedPygmentize\space -S \ifstrempy{#1}{default}{#1} -f latex
496             -P commandprefix=PYG#1 > \minted@outputdir\windows\minted@jobname.out.pyg}
497         \else
498             \ShellEscape{%
499                 \MintedPygmentize\space -S \ifstrempy{#1}{default}{#1} -f latex
500                 -P commandprefix=PYG#1 > \minted@outputdir\minted@jobname.out.pyg}%
501             \fi
502             \begingroup
503             \let\def\gdef
504             \catcode`\_ =11
505             \catcode`\- =11
506             \endlinechar=-1\relax
507             \minted@input{\minted@outputdir\minted@jobname.out.pyg}%
508             \endgroup}%
509     \fi
510 }
511 \ifthenelse{\boolean{minted@draft}}{\renewcommand{\minted@checkstyle}[1]{}{}}{}

```

`\minted@patch@PYGZsq` Patch the Pygments single quote macro for `upquote`. The single quote macro from Pygments 1.6+ needs to be patched if the `upquote` package is in use. The conditionals for the patch definition are borrowed from `upquote`. Patching is done `\AtBeginDocument`, after the macros will have been created. Patching is only attempted if the macro exists, so that there is a graceful fallback in the event of a custom Pygments stylesheet.

```

512 \newcommand{\minted@patch@PYGZsq}{%
513     \ifcsname PYGZsq\endcsname
514     \ifx\upquote@cmtt\minted@undefined\else
515     \ifx\encodingdefault\upquote@OTone
516     \ifx\ttdefault\upquote@cmtt

```

```

517         \expandafter\ifdefstring\expandafter{\csname PYGZsq\endcsname}{\char`\'}%
518         {\expandafter\gdef\csname PYGZsq\endcsname{\char13 }}{}%
519     \else
520         \expandafter\ifdefstring\expandafter{\csname PYGZsq\endcsname}{\char`\'}%
521         {\expandafter\gdef\csname PYGZsq\endcsname{\textquotesingle}}{}%
522     \fi
523 \else
524     \expandafter\ifdefstring\expandafter{\csname PYGZsq\endcsname}{\char`\'}%
525     {\expandafter\gdef\csname PYGZsq\endcsname{\textquotesingle}}{}%
526 \fi
527 \fi
528 \fi
529 }
530 \ifthenelse{\boolean{minted@draft}}{}{\AtBeginDocument{\minted@patch@PYGZsq}}

```

`\minted@def@opt@switch` And we need a switch version.

It would be possible to create a special version of `\minted@get@opt` to work with these, but that would be redundant. During the key processing, any values other than `true` and `false` are filtered out. So when using `\minted@get@opt` later, we know that that part has already been taken care of, and we can just use something like `\ifthenelse{\equal{\minted@get@opt{<opt>}}{<default>}}{true}}{...}{...}`. Of course, there is the possibility that a default value has not been set, but `\minted@def@opt@switch` sets a global default of `false` to avoid this. And as usual, Pygments values shouldn't be used without considering whether `\minted@get@opt` needs a fallback value.

```

531 \newcommand{\minted@def@opt@switch}[2][false]{%
532   \define@booleankey{minted@opt@g}{#2}%
533   {\@namedef{minted@opt@g:#2}{true}}%
534   {\@namedef{minted@opt@g:#2}{false}}
535   \define@booleankey{minted@opt@g@i}{#2}%
536   {\@namedef{minted@opt@g@i:#2}{true}}%
537   {\@namedef{minted@opt@g@i:#2}{false}}
538   \define@booleankey{minted@opt@lang}{#2}%
539   {\@namedef{minted@opt@lang\minted@lang:#2}{true}}%
540   {\@namedef{minted@opt@lang\minted@lang:#2}{false}}
541   \define@booleankey{minted@opt@lang@i}{#2}%
542   {\@namedef{minted@opt@lang\minted@lang @i:#2}{true}}%
543   {\@namedef{minted@opt@lang\minted@lang @i:#2}{false}}
544   \define@booleankey{minted@opt@cmd}{#2}%
545   {\@namedef{minted@opt@cmd:#2}{true}}%
546   {\@namedef{minted@opt@cmd:#2}{false}}%
547   \@namedef{minted@opt@g:#2}{#1}%
548 }

```

`\minted@get@opt` We need a way to traverse the hierarchy of values for a given key and return the current value that has precedence. In doing this, we need to specify a default value to use if no value is found. When working with `minted`-specific values, there should

generally be a default value; in those cases, an empty default may be supplied. But the macro should also work with Pygments settings, which are stored in macros of the same form and will sometimes need to be accessed (for example, `encoding`). In the Pygments case, there may very well be no default values on the L^AT_EX side, because we are falling back on Pygments' own built-in defaults. There is no need to duplicate those when very few Pygments values are ever needed; it is simpler to specify the default fallback when accessing the macro value.

From a programming perspective, the default argument value needs to be mandatory, so that `\minted@get@opt` can be fully expandable. This significantly simplifies accessing options.

```

549 \def\minted@get@opt#1#2{%
550   \ifcsname minted@opt@cmd:#1\endcsname
551     \csname minted@opt@cmd:#1\endcsname
552   \else
553     \ifminted@isinline
554       \ifcsname minted@opt@lang\minted@lang @i:#1\endcsname
555         \csname minted@opt@lang\minted@lang @i:#1\endcsname
556       \else
557         \ifcsname minted@opt@g@i:#1\endcsname
558           \csname minted@opt@g@i:#1\endcsname
559         \else
560           \ifcsname minted@opt@lang\minted@lang:#1\endcsname
561             \csname minted@opt@lang\minted@lang:#1\endcsname
562           \else
563             \ifcsname minted@opt@g:#1\endcsname
564               \csname minted@opt@g:#1\endcsname
565             \else
566               #2%
567             \fi
568           \fi
569         \fi
570       \fi
571     \else
572       \ifcsname minted@opt@lang\minted@lang:#1\endcsname
573         \csname minted@opt@lang\minted@lang:#1\endcsname
574       \else
575         \ifcsname minted@opt@g:#1\endcsname
576           \csname minted@opt@g:#1\endcsname
577         \else
578           #2%
579         \fi
580       \fi
581     \fi
582   \fi
583 }%
```

Actual option definitions. Some of these must be defined conditionally depending

on whether we are in draft mode; in draft mode, we need to emulate Pygments functionality with L^AT_EX, particularly with `fancyvrb`, when possible. For example, gobbling must be performed by Pygments when draft is off, but when draft is on, `fancyvrb` can perform gobbling.

Lexers.

```

584 \minted@def@optcl{encoding}{-P encoding}{#1}
585 \minted@def@optcl{outencoding}{-P outencoding}{#1}
586 \minted@def@optcl@e{escapeinside}{-P "escapeinside}{#1"}
587 \minted@def@optcl@switch{stripnl}{-P stripnl}
588 \minted@def@optcl@switch{stripall}{-P stripall}
589 % Python console
590 \minted@def@optcl@switch{python3}{-P python3}
591 % PHP
592 \minted@def@optcl@switch{funcnamehighlighting}{-P funcnamehighlighting}
593 \minted@def@optcl@switch{startinline}{-P startinline}

```

Filters.

```

594 \ifthenelse{\boolean{minted@draft}}{%
595   {\minted@def@optfv{gobble}}%
596   {\minted@def@optcl{gobble}{-F gobble:n}{#1}}
597 \minted@def@optcl{codetagify}{-F codetagify:codetags}{#1}
598 \minted@def@optcl{keywordcase}{-F keywordcase:case}{#1}

```

L^AT_EX formatter.

```

599 \minted@def@optcl@switch{texcl}{-P texcomments}
600 \minted@def@optcl@switch{texcomments}{-P texcomments}
601 \minted@def@optcl@switch{mathescape}{-P mathescape}
602 \minted@def@optfv@switch{linenos}
603 \minted@def@opt{style}

```

`fancyvrb` options.

```

604 \minted@def@optfv{frame}
605 \minted@def@optfv{framesep}
606 \minted@def@optfv{framerule}
607 \minted@def@optfv{rulecolor}
608 \minted@def@optfv{numbersep}
609 \minted@def@optfv{numbers}
610 \minted@def@optfv{firstnumber}
611 \minted@def@optfv{stepnumber}
612 \minted@def@optfv{firstline}
613 \minted@def@optfv{lastline}
614 \minted@def@optfv{baselinestretch}
615 \minted@def@optfv{xleftmargin}
616 \minted@def@optfv{xrightmargin}
617 \minted@def@optfv{fillcolor}
618 \minted@def@optfv{tabsize}

```

```

619 \minted@def@optfv{fontfamily}
620 \minted@def@optfv{fontsize}
621 \minted@def@optfv{fontshape}
622 \minted@def@optfv{fontseries}
623 \minted@def@optfv{formatcom}
624 \minted@def@optfv{label}
625 \minted@def@optfv{labelposition}
626 \minted@def@optfv@switch{numberblanklines}
627 \minted@def@optfv@switch{showspaces}
628 \minted@def@optfv@switch{resetmargins}
629 \minted@def@optfv@switch{samepage}
630 \minted@def@optfv@switch{showtabs}
631 \minted@def@optfv@switch{obeytabs}
632 % The following are patches currently added onto fancyvrb
633 \minted@def@optfv@switch{breaklines}
634 \minted@def@optfv{breakindent}
635 \minted@def@optfv@switch{breakautoindent}
636 \minted@def@optfv{breaksymbol}
637 \minted@def@optfv{breaksymbolsep}
638 \minted@def@optfv{breaksymbolindent}
639 \minted@def@optfv{breaksymbolleft}
640 \minted@def@optfv{breaksymbolsepleft}
641 \minted@def@optfv{breaksymbolindentleft}
642 \minted@def@optfv{breaksymbolright}
643 \minted@def@optfv{breaksymbolsepright}
644 \minted@def@optfv{breaksymbolindentright}
645 \minted@def@optfv{breakbefore}
646 \minted@def@optfv{breakbeforesymbolpre}
647 \minted@def@optfv{breakbeforesymbolpost}
648 \minted@def@optfv@switch{breakbeforegroup}
649 \minted@def@optfv{breakafter}
650 \minted@def@optfv@switch{breakaftergroup}
651 \minted@def@optfv{breakaftersymbolpre}
652 \minted@def@optfv{breakaftersymbolpost}
653 \minted@def@optfv@switch{breakanywhere}
654 \minted@def@optfv{breakanywheresymbolpre}
655 \minted@def@optfv{breakanywheresymbolpost}

```

Finally, options specific to `minted`.

An option to force `breaklines` to work at the Pygments token level, rather than at the character level. This is useful in keeping things like strings from being split between lines.

```

656 \minted@def@opt@switch{breakbytoken}
657 \minted@def@opt@switch{breakbytokenanywhere}

```

`bgcolor`. The original, `minipage`- and `\colorbox`-based solution was replaced with a framed-based solution in version 2.2. A dedicated framing package will

often be preferable.

```
658 \minted@def@opt{bgcolor}
```

Autogobble. We create an option that governs when Python's `textwrap.dedent()` is used to autogobble code.

```
659 \minted@def@opt@switch{autogobble}
```

```
\minted@encoding
```

When working with encoding, we will need access to the current encoding. That may be done via `\minted@get@opt`, but it is more convenient to go ahead and define a shortcut with an appropriate default

```
660 \newcommand{\minted@encoding}{\minted@get@opt{encoding}{UTF8}}
```

9.6 Additions to `fancyvrb`

The following code adds automatic line breaking functionality to `fancyvrb`'s `Verbatim` environment. The code is intentionally written as an extension to `fancyvrb`, rather than as part of `minted`. Once the code has received more use and been further refined, it probably should be separated out into its own package as an extension of `fancyvrb`.

The line breaking defined here is used in `minted`'s `minted` environment and `\mint` command, which use `Verbatim` internally. The `\mintinline` command implements line wrapping using a slightly different system (essentially, `BVerbatim`, with the `\vbox` `\let` to `\relax`). This is implemented separately within `minted`, rather than as an extension to `fancyvrb`, for simplicity and because `BVerbatim` wouldn't be itself without the box. Likewise, `breaklines` is not applied to `fancyvrb`'s `\Verb` or short verb, since their implementation is different from that of `\mintinline`. Ideally, an extension of `fancyvrb` would add line breaking to these, or (probable better) provide equivalent commands that support breaks.

9.6.1 Setup

All of the additions to `fancyvrb` should be defined conditionally. If an extension to `fancyvrb` (such as that proposed above) is loaded before `minted`, and if this extension provides `breaklines`, then we don't want to overwrite that definition and create a conflict. We assume that any extension of `fancyvrb` would use the `keyval` package, since that is what `fancyvrb` currently uses, and test for the existence of a `fancyvrb` keyval key `breaklines`.

```
661 \ifcsname KV@FV@breaklines\endcsname\else
```

9.6.2 Line breaking

Begin by defining keys, with associated macros, bools, and dimens.

`FV@BreakLines` Turn line breaking on of off.

```
662 \newboolean{FV@BreakLines}
663 \let\FV@ListProcessLine@Orig\FV@ListProcessLine
664 \define@booleankey{FV}{breaklines}%
665   {\FV@BreakLinestrue
666     \let\FV@ListProcessLine\FV@ListProcessLine@Break}%
667   {\FV@BreakLinesfalse
668     \let\FV@ListProcessLine\FV@ListProcessLine@Orig}
```

`\FV@BreakIndent`

```
669 \newdimen\FV@BreakIndent
670 \define@key{FV}{breakindent}{\FV@BreakIndent=#1}
671 \fvset{breakindent=0pt}
```

`FV@BreakAutoIndent`

```
672 \newboolean{FV@BreakAutoIndent}
673 \define@booleankey{FV}{breakautoindent}%
674   {\FV@BreakAutoIndentrue}{\FV@BreakAutoIndentfalse}
675 \fvset{breakautoindent=true}
```

`\FancyVerbBreakSymbolLeft` The left-hand symbol indicating a break. Since breaking is done in such a way that a left-hand symbol will often be desired while a right-hand symbol may not be, a shorthand option `breaksymbol` is supplied. This shorthand convention is continued with other options applying to the left-hand symbol.

```
676 \define@key{FV}{breaksymbolleft}{\def\FancyVerbBreakSymbolLeft{#1}}
677 \define@key{FV}{breaksymbol}{\fvset{breaksymbolleft=#1}}
678 \fvset{breaksymbolleft=\tiny\ensuremath{\hookrightarrow}}
```

`\FancyVerbBreakSymbolRight` The right-hand symbol indicating a break.

```
679 \define@key{FV}{breaksymbolright}{\def\FancyVerbBreakSymbolRight{#1}}
680 \fvset{breaksymbolright={}}
```

Separation of break symbols from the text.

`\FV@BreakSymbolSepLeft`

```
681 \newdimen\FV@BreakSymbolSepLeft
682 \define@key{FV}{breaksymbolsepleft}{\FV@BreakSymbolSepLeft=#1}
683 \define@key{FV}{breaksymbolsep}{\fvset{breaksymbolsepleft=#1}}
684 \fvset{breaksymbolsepleft=1em}
```

`\FV@BreakSymbolSepRight`

```
685 \newdimen\FV@BreakSymbolSepRight
686 \define@key{FV}{breaksymbolsepright}{\FV@BreakSymbolSepRight=#1}
687 \fvset{breaksymbolsepright=1em}
```

Additional indentation to make room for the break symbols.

`\FV@BreakSymbolIndentLeft`

```
688 \newdimen\FV@BreakSymbolIndentLeft
689 \settowidth{\FV@BreakSymbolIndentLeft}{\ttfamily xxxx}
690 \define@key{FV}{breaksymbolindentleft}{\FV@BreakSymbolIndentLeft=#1}
691 \define@key{FV}{breaksymbolindent}{\fvset{breaksymbolindentleft=#1}}
```

`\FV@BreakSymbolIndentRight`

```
692 \newdimen\FV@BreakSymbolIndentRight
693 \settowidth{\FV@BreakSymbolIndentRight}{\ttfamily xxxx}
694 \define@key{FV}{breaksymbolindentright}{\FV@BreakSymbolIndentRight=#1}
```

We need macros that contain the logic for typesetting the break symbols. By default, the symbol macros contain everything regarding the symbol and its typesetting, while these macros contain pure logic. The symbols should be wrapped in braces so that formatting commands (for example, `\tiny`) don't escape.

`\FancyVerbFormatBreakSymbolLeft`

```
695 \newcommand{\FancyVerbFormatBreakSymbolLeft}[1]{%
696   \ifnum\value{linenumber}=1\relax\else{#1}\fi}
```

`\FancyVerbLineBreakLast` We need a counter for keeping track of the internal line number for the last segment of a broken line, so that we can avoid putting a right continuation symbol there.

```
697 \newcounter{FancyVerbLineBreakLast}
```

`\FV@SetLineBreakLast`

```
698 \newcommand{\FV@SetLineBreakLast}{%
699   \setcounter{FancyVerbLineBreakLast}{\value{linenumber}}}
```

`\FancyVerbFormatBreakSymbolRight`

```
700 \newcommand{\FancyVerbFormatBreakSymbolRight}[1]{%
701   \ifnum\value{linenumber}=\value{FancyVerbLineBreakLast}\relax\else{#1}\fi}
```

`FV@BreakAnywhere` Allow line breaking (almost) anywhere.

```
702 \newboolean{FV@BreakAnywhere}
703 \define@booleankey{FV}{breakanywhere}%
704   {\FV@BreakAnywheretrue
705     \let\FancyVerbBreakStart\FV@Break
706     \let\FancyVerbBreakStop\FV@EndBreak
707     \let\FV@Break@Token\FV@Break@AnyToken}%
708   {\FV@BreakAnywheretruefalse
709     \let\FancyVerbBreakStart\relax
710     \let\FancyVerbBreakStop\relax}
711 \fvset{breakanywhere=false}
```

`\FancyVerbBreakStart`

```
712 \let\FancyVerbBreakStart\relax
```

`\FancyVerbBreakStop`

```
713 \let\FancyVerbBreakStop\relax
```

`\FV@EscChars` We need to define versions of common escaped characters that reduce to raw characters.

```
714 \edef\FV@hashchar{\string#}
715 \edef\FV@dollarchar{\string$}
716 \edef\FV@ampchar{\string&}
717 \edef\FV@underscorechar{\string_}
718 \edef\FV@tildechar{\string~}
719 \edef\FV@leftsquarebracket{\string[]
720 \edef\FV@rightsquarebracket{\string[]
721 \newcommand{\FV@EscChars}{%
722   \let\#\FV@hashchar
723   \let\%\FV@percentchar
724   \let\{\FV@charlb
725   \let\}\FV@charrb
726   \let\$FV@dollarchar
727   \let&FV@ampchar
728   \let\_FV@underscorechar
729   \let\\FV@backslashchar
730   \let~FV@tildechar
731   \let\~FV@tildechar
732   \let\[FV@leftsquarebracket
733   \let\]FV@rightsquarebracket
734 } %$ <- highlighting
```

`\FV@BreakBefore` Allow line breaking (almost) anywhere, but only before specified characters.

```
735 \define@key{FV}{breakbefore}{%
```

```

736 \ifstrempy{#1}%
737 {\let\FV@BreakBefore\@empty
738 \let\FancyVerbBreakStart\relax
739 \let\FancyVerbBreakStop\relax}%
740 {\def\FV@BreakBefore{#1}%
741 \let\FancyVerbBreakStart\FV@Break
742 \let\FancyVerbBreakStop\FV@EndBreak
743 \let\FV@Break@Token\FV@Break@BeforeAfterToken}%
744 }
745 \fvset{breakbefore={}}

```

FV@BreakBeforeGroup Determine whether breaking before specified characters is always allowed before each individual character, or is only allowed before the first in a group of identical characters.

```

746 \newboolean{FV@BreakBeforeGroup}
747 \define@booleankey{FV}{breakbeforegroup}%
748 {\FV@BreakBeforeGrouptrue}%
749 {\FV@BreakBeforeGroupfalse}%
750 \fvset{breakbeforegroup=true}

```

\FV@BreakBeforePrep We need a way to break before characters if they have been specified as breaking characters. It would be possible to do that via a nested conditional, but that would be messy. It is much simpler to create an empty macro whose name contains the character, and test for the existence of this macro. This needs to be done inside a `\begingroup... \endgroup` so that the macros do not have to be cleaned up manually. A good place to do this is in `\FV@FormattingPrep`, which is inside a group and before processing starts. The macro is added to `\FV@FormattingPrep` below, after `\FV@BreakAfterPrep` is defined.

The procedure here is a bit roundabout. We need to use `\FV@EscChars` to handle character escapes, but the character redefinitions need to be kept local, requiring that we work within a `\begingroup... \endgroup`. So we loop through the breaking tokens and assemble a macro that will itself define character macros. Only this defining macro is declared global, and it contains *expanded* characters so that there is no longer any dependence on `\FV@EscChars`.

```

751 \def\FV@BreakBeforePrep{%
752 \ifx\FV@BreakBefore\@empty\relax
753 \else
754 \gdef\FV@BreakBefore@Def{}%
755 \begingroup
756 \def\FV@BreakBefore@Process##1##2\FV@Undefined{%
757 \expandafter\FV@BreakBefore@Process@i\expandafter{##1}%
758 \expandafter\ifx\expandafter\relax\detokenize{##2}\relax
759 \else
760 \FV@BreakBefore@Process##2\FV@Undefined
761 \fi
762 }%

```



```

763 \def\FV@BreakBefore@Process@i##1{%
764 \g@addto@macro\FV@BreakBefore@Def{%
765 \@namedef{FV@BreakBefore@Token\detokenize{##1}}{}}%
766 }%
767 \FV@EscChars
768 \expandafter\FV@BreakBefore@Process\FV@BreakBefore\FV@Undefined
769 \endgroup
770 \FV@BreakBefore@Def
771 \fi
772 }

```

`\FV@BreakAfter` Allow line breaking (almost) anywhere, but only after specified characters.

```

773 \define@key{FV}{breakafter}{%
774 \ifstrepty{#1}%
775 {\let\FV@BreakAfter\@empty
776 \let\FancyVerbBreakStart\relax
777 \let\FancyVerbBreakStop\relax}%
778 {\def\FV@BreakAfter{#1}%
779 \let\FancyVerbBreakStart\FV@Break
780 \let\FancyVerbBreakStop\FV@EndBreak
781 \let\FV@Break@Token\FV@Break@BeforeAfterToken}%
782 }
783 \fvset{breakafter={}}

```

`FV@BreakAfterGroup` Determine whether breaking after specified characters is always allowed after each individual character, or is only allowed after groups of identical characters.

```

784 \newboolean{FV@BreakAfterGroup}
785 \define@booleankey{FV}{breakaftergroup}%
786 {\FV@BreakAfterGrouptrue}%
787 {\FV@BreakAfterGroupfalse}%
788 \fvset{breakaftergroup=true}

```

`\FV@BreakAfterPrep` We need a way to break after characters if they have been specified as breaking characters. It would be possible to do that via a nested conditional, but that would be messy. It is much simpler to create an empty macro whose name contains the character, and test for the existence of this macro. This needs to be done inside a `\begingroup...\endgroup` so that the macros do not have to be cleaned up manually. A good place to do this is in `\FV@FormattingPrep`, which is inside a group and before processing starts.

The procedure here is a bit roundabout. We need to use `\FV@EscChars` to handle character escapes, but the character redefinitions need to be kept local, requiring that we work within a `\begingroup...\endgroup`. So we loop through the breaking tokens and assemble a macro that will itself define character macros. Only this defining macro is declared global, and it contains *expanded* characters so that there is no longer any dependence on `\FV@EscChars`.

```

789 \def\FV@BreakAfterPrep{%
790   \ifx\FV@BreakAfter\@empty\relax
791   \else
792     \gdef\FV@BreakAfter@Def{%
793       \begingroup
794       \def\FV@BreakAfter@Process##1##2\FV@Undefined{%
795         \expandafter\FV@BreakAfter@Process@i\expandafter{##1}%
796         \expandafter\ifx\expandafter\relax\detokenize{##2}\relax
797         \else
798           \FV@BreakAfter@Process##2\FV@Undefined
799         \fi
800       }%
801       \def\FV@BreakAfter@Process@i##1{%
802         \ifcsname FV@BreakBefore@Token\detokenize{##1}\endcsname
803         \ifthenelse{\boolean{FV@BreakBeforeGroup}}{%
804           {\ifthenelse{\boolean{FV@BreakAfterGroup}}{%
805             {}%
806             {\PackageError{minted}%
807              {Conflicting breakbeforegroup and breakaftergroup for "\detokenize{##1}"
808              {Conflicting breakbeforegroup and breakaftergroup for "\detokenize{##1}"
809             {\ifthenelse{\boolean{FV@BreakAfterGroup}}{%
810               {\PackageError{minted}%
811                {Conflicting breakbeforegroup and breakaftergroup for "\detokenize{##1}"
812                {Conflicting breakbeforegroup and breakaftergroup for "\detokenize{##1}"
813               }}}%
814           \else
815           \fi
816         \g@addto@macro\FV@BreakAfter@Def{%
817           \@namedef{FV@BreakAfter@Token\detokenize{##1}}{}}}%
818       }%
819       \FV@EscChars
820       \expandafter\FV@BreakAfter@Process\FV@BreakAfter\FV@Undefined
821     \endgroup
822     \FV@BreakAfter@Def
823   \fi
824 }

```

Now that `\FV@BreakBeforePrep` and `\FV@BreakAfterPrep` are defined, add them to `\FV@FormattingPrep`. The ordering here is important, since `\FV@BreakAfterPrep` contains compatibility checks with `\FV@BreakBeforePrep`, and thus must be used after it.

```

825 \expandafter\def\expandafter\FV@FormattingPrep\expandafter{%
826   \expandafter\FV@BreakBeforePrep\expandafter\FV@BreakAfterPrep\FV@FormattingPrep}

```

`\VerbBreakAnywhereSymbolPre` The pre-break symbol for breaks introduced by `breakanywhere`. That is, the symbol before breaks that occur between characters, rather than at spaces.

```

827 \define@key{FV}{breakanywheresymbolpre}{%

```

```

828 \ifstrempy{#1}%
829   {\def\FancyVerbBreakAnywhereSymbolPre{}}}%
830   {\def\FancyVerbBreakAnywhereSymbolPre{\hbox{#1}}}%
831 \fvset{breakanywheresymbolpre={\,\footnotesize\ensuremath{\_}\rfloor}}

```

`\FancyVerbBreakAnywhereSymbolPost` The post-break symbol for breaks introduced by `breakanywhere`.

```

832 \define@key{FV}{breakanywheresymbolpost}{%
833   \ifstrempy{#1}%
834     {\def\FancyVerbBreakAnywhereSymbolPost{}}}%
835     {\def\FancyVerbBreakAnywhereSymbolPost{\hbox{#1}}}%
836 \fvset{breakanywheresymbolpost={}}

```

`\FancyVerbBreakBeforeSymbolPre` The pre-break symbol for breaks introduced by `breakbefore`.

```

837 \define@key{FV}{breakbeforesymbolpre}{%
838   \ifstrempy{#1}%
839     {\def\FancyVerbBreakBeforeSymbolPre{}}}%
840     {\def\FancyVerbBreakBeforeSymbolPre{\hbox{#1}}}%
841 \fvset{breakbeforesymbolpre={\,\footnotesize\ensuremath{\_}\rfloor}}

```

`\FancyVerbBreakBeforeSymbolPost` The post-break symbol for breaks introduced by `breakbefore`.

```

842 \define@key{FV}{breakbeforesymbolpost}{%
843   \ifstrempy{#1}%
844     {\def\FancyVerbBreakBeforeSymbolPost{}}}%
845     {\def\FancyVerbBreakBeforeSymbolPost{\hbox{#1}}}%
846 \fvset{breakbeforesymbolpost={}}

```

`\FancyVerbBreakAfterSymbolPre` The pre-break symbol for breaks introduced by `breakafter`.

```

847 \define@key{FV}{breakaftersymbolpre}{%
848   \ifstrempy{#1}%
849     {\def\FancyVerbBreakAfterSymbolPre{}}}%
850     {\def\FancyVerbBreakAfterSymbolPre{\hbox{#1}}}%
851 \fvset{breakaftersymbolpre={\,\footnotesize\ensuremath{\_}\rfloor}}

```

`\FancyVerbBreakAfterSymbolPost` The post-break symbol for breaks introduced by `breakafter`.

```

852 \define@key{FV}{breakaftersymbolpost}{%
853   \ifstrempy{#1}%
854     {\def\FancyVerbBreakAfterSymbolPost{}}}%
855     {\def\FancyVerbBreakAfterSymbolPost{\hbox{#1}}}%
856 \fvset{breakaftersymbolpost={}}

```

`\FancyVerbBreakAnywhereBreak` When `breakanywhere=true`, line breaks may occur at almost any location. This is the macro that governs the breaking in those cases. By default, `\discretionary` is used. `\discretionary` takes three arguments: a character to insert before the

break, a character to insert after the break, and a character to insert if there is no break.

`\discretionary` will generally only insert breaks when breaking at spaces simply cannot make lines short enough (this may be tweaked to some extent with hyphenation settings). This can produce a somewhat ragged appearance in some cases. If you want breaks exactly at the margin (or as close as possible) regardless of whether a break at a space is an option, you may want to use `\allowbreak` instead.

```
857 \newcommand{\FancyVerbBreakAnywhereBreak}{%
858   \discretionary{\FancyVerbBreakAnywhereSymbolPre}%
859   {\FancyVerbBreakAnywhereSymbolPost}{}}
```

`\FancyVerbBreakBeforeBreak` The macro governing breaking for `breakbefore=true`.

```
860 \newcommand{\FancyVerbBreakBeforeBreak}{%
861   \discretionary{\FancyVerbBreakBeforeSymbolPre}%
862   {\FancyVerbBreakBeforeSymbolPost}{}}
```

`\FancyVerbBreakAfterBreak` The macro governing breaking for `breakafter=true`.

```
863 \newcommand{\FancyVerbBreakAfterBreak}{%
864   \discretionary{\FancyVerbBreakAfterSymbolPre}%
865   {\FancyVerbBreakAfterSymbolPost}{}}
```

Define helper macros.

`\FV@LineBox` A box for saving a line of code, so that its dimensions may be determined and thus we may figure out if it needs line breaking.

```
866 \newsavebox{\FV@LineBox}
```

`\FV@LineIndentBox` A box for saving the indentation of code, so that its dimensions may be determined for use in autoindentation of continuation lines.

```
867 \newsavebox{\FV@LineIndentBox}
```

`\FV@LineIndentChars` A macro for storing the indentation characters, if any, of a given line. For use in autoindentation of continuation lines

```
868 \let\FV@LineIndentChars\@empty
```

`\FV@GetLineIndent` A macro that takes a line and determines the indentation, storing the indentation chars in `\FV@LineIndentChars`.

```
869 \def\FV@GetNextChar{\let\FV@NextChar=}
870 \def\FV@CleanRemainingChars#1\FV@Undefined{}
```

```

871 \def\FV@GetLineIndent{\afterassignment\FV@CheckIndentChar\FV@GetNextChar}
872 \def\FV@CheckIndentChar{%
873   \ifx\FV@NextChar\FV@Undefined
874     \let\FV@Next=\relax
875   \else
876     \expandafter\ifx\FV@NextChar\FV@Space
877       \g@addto@macro{\FV@LineIndentChars}{\FV@Space}%
878       \let\FV@Next=\FV@GetLineIndent
879     \else
880       \expandafter\ifx\FV@NextChar\FV@Tab
881         \g@addto@macro{\FV@LineIndentChars}{\FV@Tab}%
882         \let\FV@Next=\FV@GetLineIndent
883       \else
884         \let\FV@Next=\FV@CleanRemainingChars
885       \fi
886     \fi
887   \fi
888   \FV@Next
889 }

```

Define the macros that actually perform `breakanywhere`, `breakbefore`, and `breakafter`.

`\FV@Break` The entry macro for breaking lines, either anywhere or before/after specified characters. The current line (or argument) will be scanned token by token/group by group, and accumulated (with added potential breaks) in `\FV@Tmp`. After scanning is complete, `\FV@Tmp` will be inserted. It would be possible to insert each token/group into the document immediately after it is scanned, instead of accumulating them in a “buffer.” But that would interfere with macros. Even in the current approach, macros that take optional arguments are problematic.⁷

```

890 \def\FV@Break{%
891   \def\FV@Tmp{ }%
892   \let\FV@LastToken\minted@undefined
893   \FV@Break@Scan
894 }

```

`\FV@EndBreak`

```

895 \def\FV@EndBreak{\FV@Tmp}

```

`\FV@Break@Scan` Look ahead via `\@ifnextchar`. Don’t do anything if we’re at the end of the region to be scanned. Otherwise, invoke a macro to deal with what’s next based on whether it is math, or a group, or something else.

⁷Through a suitable definition that tracks the current state and looks for square brackets, this might be circumvented. Then again, in verbatim contexts, macro use should be minimal, so the restriction to macros without optional arguments should generally not be an issue.

This and some following macros are defined inside of groups, to ensure proper catcodes.

```

896 \begingroup
897 \catcode'\$=3%
898 \gdef\FV@Break@Scan{%
899   \@ifnextchar\FV@EndBreak%
900   {}%
901   {\ifx\@let@token$\relax
902     \let\FV@Break@Next\FV@Break@Math
903   \else
904     \ifx\@let@token\bgroup\relax
905       \let\FV@Break@Next\FV@Break@Group
906     \else
907       \let\FV@Break@Next\FV@Break@Token
908     \fi
909   \fi
910   \FV@Break@Next}%
911 }
912 \endgroup

```

`\FV@Break@Math` Grab an entire math span, and insert it into `\FV@Tmp`. Due to grouping, this works even when math contains things like `\text{x}`. After dealing with the math span, continue scanning.

```

913 \begingroup
914 \catcode'\$=3%
915 \gdef\FV@Break@Math$#1${%
916   \g@addto@macro{\FV@Tmp}{$#1$}%
917   \let\FV@LastToken\minted@undefined
918   \FV@Break@Scan}
919 \endgroup

```

`\FV@Break@Group` Grab the group, and insert it into `\FV@Tmp` (as a group) before continuing scanning.

```

920 \def\FV@Break@Group#1{%
921   \g@addto@macro{\FV@Tmp}{\{#1\}}%
922   \ifstrepty{#1}{\let\FV@LastToken\minted@undefined}%
923   \FV@Break@Scan}

```

`\FV@Break@Token` This macro is `\let` to `\FV@Break@AnyToken` or `\FV@Break@BeforeAfterToken` by the `breakanywhere` and `breakbefore/breakafter` options, so it is not explicitly defined.

`\FV@Break@AnyToken` Deal with breaking around any token.

If it is ever necessary, it would be possible to create a more sophisticated version involving catcode checks via `\ifcat`. Something like this:

```

\begingroup
\catcode`\a=11
\catcode`\+=12
\gdef\FV@Break...
  \ifcat\noexpand#1a
    \g@addto@macro{\FV@Tmp}...
  \else
...
\endgroup

```

This doesn't break macros with *mandatory* arguments, because `\FancyVerbBreakAnywhereBreak` is inserted *before* the token. Groups themselves are added without any special handling. So a macro would end up right next to its original arguments, without anything being inserted. Optional arguments will cause this approach to fail; there is currently no attempt to identify them, since that is a much harder problem.

```

924 \def\FV@Break@AnyToken#1{%
925   \g@addto@macro{\FV@Tmp}{\FancyVerbBreakAnywhereBreak#1}%
926   \FV@Break@Scan}

```

`\FV@Break@BeforeAfterToken` Deal with breaking around only specified tokens. This is a bit trickier. We only break if a macro corresponding to the token exists. We also need to check whether the specified token should be grouped, that is, whether breaks are allowed between identical characters. All of this has to be written carefully so that nothing is accidentally inserted into the stream for future scanning.

Dealing with tokens followed by empty groups (for example, `\x{}`) is particularly challenging when we want to avoid breaks between identical characters. When a token is followed by a group, we need to save the current token for later reference (`\x` in the example), then capture and save the following group, and then—only if the group was empty—see if the following token is identical to the old saved token.

```

927 \def\FV@Break@BeforeAfterToken#1{%
928   \ifcsname FV@BreakBefore@Token\detokenize{#1}\endcsname
929     \let\FV@Break@Next\FV@Break@BeforeTokenBreak
930   \else
931     \ifcsname FV@BreakAfter@Token\detokenize{#1}\endcsname
932       \let\FV@Break@Next\FV@Break@AfterTokenBreak
933     \else
934       \let\FV@Break@Next\FV@Break@BeforeAfterTokenNoBreak
935     \fi
936   \fi
937   \FV@Break@Next{#1}%
938 }
939 \def\FV@Break@BeforeAfterTokenNoBreak#1{%
940   \g@addto@macro{\FV@Tmp}{#1}%
941   \let\FV@LastToken#1%
942   \FV@Break@Scan}
943 \def\FV@Break@BeforeTokenBreak#1{%
944   \ifthenelse{\boolean{FV@BreakBeforeGroup}}{

```

```

945 {\ifx#1\FV@LastToken\relax
946   \ifcsname FV@BreakAfter@Token\detokenize{#1}\endcsname
947   \let\FV@Break@Next\FV@Break@BeforeTokenBreak@AfterRescan
948   \def\FV@RescanToken{#1}%
949   \else
950     \g@addto@macro{\FV@Tmp}{#1}%
951     \let\FV@Break@Next\FV@Break@Scan
952     \let\FV@LastToken#1%
953   \fi
954 \else
955   \ifcsname FV@BreakAfter@Token\detokenize{#1}\endcsname
956   \g@addto@macro{\FV@Tmp}{\FancyVerbBreakBeforeBreak}%
957   \let\FV@Break@Next\FV@Break@BeforeTokenBreak@AfterRescan
958   \def\FV@RescanToken{#1}%
959   \else
960     \g@addto@macro{\FV@Tmp}{\FancyVerbBreakBeforeBreak#1}%
961     \let\FV@Break@Next\FV@Break@Scan
962     \let\FV@LastToken#1%
963   \fi
964 \fi}%
965 {\ifcsname FV@BreakAfter@Token\detokenize{#1}\endcsname
966   \g@addto@macro{\FV@Tmp}{\FancyVerbBreakBeforeBreak}%
967   \let\FV@Break@Next\FV@Break@BeforeTokenBreak@AfterRescan
968   \def\FV@RescanToken{#1}%
969   \else
970     \g@addto@macro{\FV@Tmp}{\FancyVerbBreakBeforeBreak#1}%
971     \let\FV@Break@Next\FV@Break@Scan
972     \let\FV@LastToken#1%
973   \fi}%
974 \FV@Break@Next}
975 \def\FV@Break@BeforeTokenBreak@AfterRescan{%
976   \expandafter\FV@Break@AfterTokenBreak\FV@RescanToken}
977 \def\FV@Break@AfterTokenBreak#1{%
978   \let\FV@LastToken#1%
979   \@ifnextchar\FV@Space%
980   {\g@addto@macro{\FV@Tmp}{#1}\FV@Break@Scan}%
981   {\ifthenelse{\boolean{FV@BreakAfterGroup}}%
982     {\ifx\@let@token#1\relax
983       \g@addto@macro{\FV@Tmp}{#1}%
984       \let\FV@Break@Next\FV@Break@Scan
985     \else
986       \ifx\@let@token\bgroup\relax
987         \g@addto@macro{\FV@Tmp}{#1}%
988         \let\FV@Break@Next\FV@Break@AfterTokenBreak@Group
989       \else
990         \g@addto@macro{\FV@Tmp}{#1\FancyVerbBreakAfterBreak}%
991         \let\FV@Break@Next\FV@Break@Scan
992       \fi
993     \fi}%
994   {\g@addto@macro{\FV@Tmp}{#1\FancyVerbBreakAfterBreak}%

```



```

995     \let\FV@Break@Next\FV@Break@Scan}%
996     \FV@Break@Next}%
997 }
998 \def\FV@Break@AfterTokenBreak@Group#1{%
999     \g@addto@macro{\FV@Tmp}{\#1}%
1000     \ifstrempy{\#1}%
1001     {\let\FV@Break@Next\FV@Break@AfterTokenBreak@Group@i}%
1002     {\let\FV@Break@Next\FV@Break@Scan\let\FV@LastToken\minted@undefined}%
1003     \FV@Break@Next}
1004 \def\FV@Break@AfterTokenBreak@Group@i{%
1005     \@ifnextchar\FV@LastToken%
1006     {\FV@Break@Scan}%
1007     {\g@addto@macro{\FV@Tmp}{\FancyVerbBreakAfterBreak}%
1008     \FV@Break@Scan}}

```

And finally the really important things.

`\FV@makeLineNumber` We need a version of `lineno`'s `\makeLineNumber` that is adapted for our purposes. This is adapted directly from the example `\makeLineNumber` that is given in the `lineno` documentation under the discussion of internal line numbers. The `\FV@SetLineBreakLast` is needed to determine the internal line number of the last segment of the broken line, so that we can disable the right-hand break symbol on this segment. When a right-hand break symbol is in use, a line of code will be processed twice: once to determine the last internal line number, and once to use this information only to insert right-hand break symbols on the appropriate lines. During the second run, `\FV@SetLineBreakLast` is disabled by `\letting` it to `\relax`.

```

1009 \def\FV@makeLineNumber{%
1010     \hss
1011     \FancyVerbFormatBreakSymbolLeft{\FancyVerbBreakSymbolLeft}%
1012     \hbox to \FV@BreakSymbolSepLeft{\hfill}%
1013     \rlap{\hskip\linewidth
1014         \hbox to \FV@BreakSymbolSepRight{\hfill}%
1015         \FancyVerbFormatBreakSymbolRight{\FancyVerbBreakSymbolRight}%
1016         \FV@SetLineBreakLast
1017     }%
1018 }

```

`\FV@SaveLineBox` This is the macro that does most of the work. This was inspired by Marco Daniel's code at <http://tex.stackexchange.com/a/112573/10742>.

This macro is invoked when a line is too long. We modify the `\linewidth` to take into account `breakindent` and `breakautoindent`, and insert `\hboxes` to fill the empty space. We also account for `breaksymbolindentleft` and `breaksymbolindentright`, but *only* when there are actually break symbols. The code is placed in a `\parbox`. Break symbols are inserted via `lineno`'s `internallinenumbers*`, which does internal line numbers without continuity

between environments (the `linenumber` counter is automatically reset). The beginning of the code has negative `\hspace` inserted to pull it out to the correct starting position. `\struts` are used to maintain correct line heights. The `\parbox` is followed by an empty `\hbox` that takes up the space needed for a right-hand break symbol (if any).

```

1019 \def\FV@SaveLineBox#1{%
1020   \savebox{\FV@LineBox}{%
1021     \advance\linewidth by -\FV@BreakIndent
1022     \hbox to \FV@BreakIndent{\hfill}%
1023     \ifthenelse{\boolean{FV@BreakAutoIndent}}{%
1024       {\let\FV@LineIndentChars\@empty
1025        \FV@GetLineIndent#1\FV@Undefined
1026        \savebox{\FV@LineIndentBox}{\FV@LineIndentChars}%
1027        \hbox to \wd\FV@LineIndentBox{\hfill}%
1028        \advance\linewidth by -\wd\FV@LineIndentBox}%
1029       }%
1030     \ifdefempty{\FancyVerbBreakSymbolLeft}}{%
1031       {\hbox to \FV@BreakSymbolIndentLeft{\hfill}%
1032        \advance\linewidth by -\FV@BreakSymbolIndentLeft}%
1033     \ifdefempty{\FancyVerbBreakSymbolRight}}{%
1034       {\advance\linewidth by -\FV@BreakSymbolIndentRight}%
1035     \parbox[t]{\linewidth}{%
1036       \raggedright
1037       \leftlinenumber*
1038       \begin{internallinenumber*}%
1039         \let\makeLineNumber\FV@makeLineNumber
1040         \noindent\hspace*{-\FV@BreakIndent}%
1041         \ifdefempty{\FancyVerbBreakSymbolLeft}}{%
1042           \hspace*{-\FV@BreakSymbolIndentLeft}}%
1043         \ifthenelse{\boolean{FV@BreakAutoIndent}}{%
1044           {\hspace*{-\wd\FV@LineIndentBox}}%
1045           }%
1046         \strut\FancyVerbFormatText{%
1047           \FancyVerbBreakStart#1\FancyVerbBreakStop}\nobreak\strut
1048         \end{internallinenumber*}
1049       }%
1050     \ifdefempty{\FancyVerbBreakSymbolRight}}{%
1051       {\hbox to \FV@BreakSymbolIndentRight{\hfill}}%
1052     }%
1053   }

```

`\FancyVerbFormatText` The introduction of line breaks introduces an issue for `\FancyVerbFormatLine`. Does it format the entire line (outside the `\parbox`), or only the text part of the line (inside the `\parbox`)? Since both might be desirable, `\FancyVerbFormatLine` is assigned to the entire line, and a new macro `\FancyVerbFormatText` is assigned to the text, within the `\parbox`.

```

1054 \def\FancyVerbFormatText#1{#1}

```

`\FV@ListProcessLine@Break` This macro is based on `\FV@ListProcessLine` and follows it as closely as possible. The `\linewidth` is reduced by `\FV@FrameSep` and `\FV@FrameRule` so that text will not overrun frames. This is done conditionally based on which frames are in use. We save the current line in a box, and only do special things if the box is too wide. For uniformity, all text is placed in a `\parbox`, even if it doesn't need to be wrapped.

If a line is too wide, then it is passed to `\FV@SaveLineBox`. If there is no right-hand break symbol, then the saved result in `\FV@LineBox` may be used immediately. If there is a right-hand break symbol, then the line must be processed a second time, so that the right-hand break symbol may be removed from the final segment of the broken line (since it does not continue). During the first use of `\FV@SaveLineBox`, the counter `FancyVerbLineBreakLast` is set to the internal line number of the last segment of the broken line. During the second use of `\FV@SaveLineBox`, we disable this (`\let\FV@SetLineBreakLast\relax`) so that the value of `FancyVerbLineBreakLast` remains fixed and thus may be used to determine when a right-hand break symbol should be inserted.

```

1055 \def\FV@ListProcessLine@Break#1{%
1056   \ifx\FV@ObeyTabsInit\relax\else
1057     \PackageError{minted}%
1058     {the options obeytabs and breaklines are not compatible}{}%
1059   \fi
1060   \hbox to \hsize{%
1061     \kern\leftmargin
1062     \hbox to \linewidth{%
1063       \ifx\FV@RightListFrame\relax\else
1064         \advance\linewidth by -\FV@FrameSep
1065         \advance\linewidth by -\FV@FrameRule
1066       \fi
1067       \ifx\FV@LeftListFrame\relax\else
1068         \advance\linewidth by -\FV@FrameSep
1069         \advance\linewidth by -\FV@FrameRule
1070       \fi
1071       \sbox{\FV@LineBox}{\FancyVerbFormatLine{\FancyVerbFormatText{#1}}}%
1072       \ifdim\wd\FV@LineBox>\linewidth
1073         \setcounter{FancyVerbLineBreakLast}{0}%
1074         \FV@SaveLineBox{#1}%
1075         \ifdefempty{\FancyVerbBreakSymbolRight}{}{%
1076           \let\FV@SetLineBreakLast\relax
1077           \FV@SaveLineBox{#1}}%
1078         \FV@LeftListNumber
1079         \FV@LeftListFrame
1080         \FancyVerbFormatLine{\usebox{\FV@LineBox}}%
1081         \FV@RightListFrame
1082         \FV@RightListNumber
1083       \else
1084         \FV@LeftListNumber
1085         \FV@LeftListFrame

```

```

1086 \FancyVerbFormatLine{%
1087     \parbox[t]{\linewidth}{\noindent\strut\FancyVerbFormatText{#1}\strut}}%
1088 \FV@RightListFrame
1089 \FV@RightListNumber
1090 \fi}%
1091 \hss\baselineskip\z@\lineskip\z@}

```

9.7 linenos

Since `fancyvrb` currently doesn't have a `linenos` key, we create one that mimics `numbers=left` (but only after checking to make sure that another package hasn't already patched this).

```

1092 \ifcsname KV@FV@linenos\endcsname\else
1093 \define@booleankey{FV}{linenos}%
1094     {\@nameuse{FV@Numbers@left}}{\@nameuse{FV@Numbers@none}}
1095 \fi

```

9.8 Cleanup

Finally, end the conditional creation of `fancyvrb` extensions.

```

1096 \fi

```

9.9 Internal helpers

`\minted@bgbox` Define an environment that may be wrapped around a `minted` environment to assign a background color. This is retained as a holdover from version 1.0. In most cases, it is probably better to use a dedicated framing package, such as `tcolorbox` or `mdframed`.

First, we need to define a new save box.

```

1097 \newsavebox{\minted@bgbox}

```

Now we can define the environment that applies a background color. Prior to `minted` 2.2, this involved a `minipage`. However, that approach was problematic because it did not allow linebreaks, would be pushed into the margin by immediately preceding text, and had very different whitespace separation from preceding and following text compared to no background color. In version 2.2, this was replaced with an approach based on `framed`. `\FV@NumberSep` is adjusted by `\fboxsep` to ensure that line numbers remain in the same location in the margin regardless of whether `bgcolor` is used.

```

1098 \newenvironment{minted@colorbg}[1]{%

```

```

1099 \setlength{\OuterFrameSep}{0pt}%
1100 \colorlet{shadecolor}{#1}%
1101 \let\minted@tmp\FV@NumberSep
1102 \edef\FV@NumberSep{%
1103   \the\numexpr\dimexpr\minted@tmp+\number\fbboxsep\relax sp\relax}%
1104 \medskip
1105 \begin{snugshade*}}
1106 {\end{snugshade*}%
1107 \medskip\noindent}

```

`\minted@code` Create a file handle for saving code (and anything else that must be written to temp files).

```
1108 \newwrite\minted@code
```

`\minted@savecode` Save code to be pygmentized to a file.

```

1109 \newcommand{\minted@savecode}[1]{
1110   \immediate\openout\minted@code\minted@jobname.pyg\relax
1111   \immediate\write\minted@code{\expandafter\detokenize\expandafter{#1}}%
1112   \immediate\closeout\minted@code}

```

`minted@FancyVerbLineTemp` At various points, we will need a temporary counter for storing and then restoring the value of `FancyVerbLine`. When using the `langlinenos` option, we need to store the current value of `FancyVerbLine`, then set `FancyVerbLine` to the current value of a language-specific counter, and finally restore `FancyVerbLine` to its initial value after the current chunk of code has been typeset. In patching `VerbatimOut`, we need to prevent `FancyVerbLine` from being incremented during the write process.

```
1113 \newcounter{minted@FancyVerbLineTemp}
```

`\minted@FVB@VerbatimOut` We need a custom version of `fancyvrb`'s `\FVB@VerbatimOut` that supports Unicode (everything written to file is `\detokenized`). We also need to prevent the value of `FancyVerbLine` from being incorrectly incremented.

```

1114 \newcommand{\minted@write@detok}[1]{%
1115   \immediate\write\FV@OutFile{\detokenize{#1}}}
1116 \newcommand{\minted@FVB@VerbatimOut}[1]{%
1117   \setcounter{minted@FancyVerbLineTemp}{\value{FancyVerbLine}}%
1118   \@bsphack
1119   \begingroup
1120     \FV@UseKeyValues
1121     \FV@DefineWhiteSpace
1122     \def\FV@Space{\space}%
1123     \FV@DefineTabOut
1124     \let\FV@ProcessLine\minted@write@detok
1125     \immediate\openout\FV@OutFile #1\relax

```

```

1126 \let\FV@FontScanPrep\relax
1127 \let\@noligs\relax
1128 \FV@Scan}

```

`\minted@FVE@VerbatimOut` Likewise, we need a custom version of `\FVE@VerbatimOut` that completes the protection of `FancyVerbLine` from being incremented.

```

1129 \newcommand{\minted@FVE@VerbatimOut}{%
1130 \immediate\closeout\FV@OutFile\endgroup\@esphack
1131 \setcounter{FancyVerbLine}{\value{minted@FancyVerbLineTemp}}}%

```

`\MintedPygmentize` We need a way to customize the executable/script that is called to perform highlighting. Typically, we will want `pygmentize`. But advanced users might wish to use a custom Python script instead. The command is only defined if it does not exist. In general, the command should be `\renewcommanded` after the package is loaded, but this way, it will work if defined before `minted` is loaded.

```

1132 \ifcsname MintedPygmentize\endcsname\else
1133 \newcommand{\MintedPygmentize}{pygmentize}
1134 \fi

```

`minted@pygmentizecounter` We need a counter to keep track of how many files have been pygmentized. This is primarily used with `finalizcache` for naming cache files sequentially in `listing<number>.pygtex` form.

```

1135 \newcounter{minted@pygmentizecounter}

```

`\minted@pygmentize` Pygmentize a file (default: `\minted@outputdir\minted@jobname.pyg`) using the options provided.

Unfortunately, the logic for caching is a little complex due to operations that are OS- and engine-dependent.

The name of cached files is the result of concatenating the md5 of the code and the md5 of the command. This results in a filename that is longer than ideal (64 characters plus path and extension). Unfortunately, this is the only robust approach that is possible using the built-in pdfTeX hashing capabilities.⁸ LuaTeX could do better, by hashing the command and code together. The Python script that provides XeTeX capabilities simply runs both the command and the code through a single sha1 hasher, but has the additional overhead of the `\write18` call and Python execution.

One potential concern is that caching should also keep track of the command from which code originates. What if identical code is highlighted with identical settings in both the `minted` environment and `\mintinline` command? In both cases, what

⁸It would be possible to use only the cache of the code, but that approach breaks down as soon as the code is used multiple times with different options. While that may seem unlikely in practice, it occurs in this documentation and may be expected to occur in other docs.

is actually saved by Pygments is identical. The difference in final appearance is due to how the environment and command treat the Pygments output.

This macro must always be checked carefully whenever it is modified. Under no circumstances should #1 be written to or opened by Python in write mode. When \inputminted is used, #1 will be an external file that is brought in for highlighting, so it must be left intact.

```

1136 \newcommand{\minted@pygmentize}[2][\minted@outputdir\minted@jobname.pyg]{%
1137   \stepcounter{minted@pygmentizecounter}%
1138   \ifthenelse{\equal{\minted@get@opt{autogobble}}{false}}{true}}%
1139   {\def\minted@codefile{\minted@outputdir\minted@jobname.pyg}}%
1140   {\def\minted@codefile{#1}}%
1141   \ifthenelse{\boolean{minted@isinline}}%
1142     {\def\minted@optlistcl@inlines{%
1143       \minted@optlistcl@g@i
1144       \csname minted@optlistcl@lang\minted@lang @i\endcsname}}%
1145     {\let\minted@optlistcl@inlines\empty}%
1146   \def\minted@cmd{%
1147     \ifminted@kpsewhich\ifwindows powershell\space\fi\fi
1148     \MintedPygmentize\space -l #2
1149     -f latex -P commandprefix=PYG -F tokenmerge
1150     \minted@optlistcl@g \csname minted@optlistcl@lang\minted@lang\endcsname
1151     \minted@optlistcl@inlines
1152     \minted@optlistcl@cmd -o \minted@outputdir\minted@infile\space
1153     \ifminted@kpsewhich
1154       \ifwindows
1155         \detokenize{$}(kpsewhich \minted@codefile)%
1156       \else
1157         \detokenize{' }kpsewhich \minted@codefile\space
1158         \detokenize{||} \minted@codefile\detokenize{'}%
1159       \fi
1160     \else
1161       \minted@codefile
1162     \fi}%
1163   % For debugging, uncomment: %%%
1164   % \immediate\typeout{\minted@cmd}%
1165   % %%%
1166   \ifthenelse{\boolean{minted@cache}}%
1167     {%
1168       \ifminted@frozenscache
1169       \else
1170         \ifx\XeTeXinterchartoks\minted@undefined
1171           \ifthenelse{\equal{\minted@get@opt{autogobble}}{false}}{true}}%
1172           {\edef\minted@hash{\pdf@filemdfivesum{#1}%
1173             \pdf@mdfivesum{\minted@cmd autogobble}}}%
1174           {\edef\minted@hash{\pdf@filemdfivesum{#1}%
1175             \pdf@mdfivesum{\minted@cmd}}}%
1176         \else
1177           \ifx\mdfivesum\minted@undefined

```

```

1178 \immediate\openout\minted@code\minted@jobname.mintedcmd\relax
1179 \immediate\write\minted@code{\minted@cmd}%
1180 \ifthenelse{\equal{\minted@get@opt{autogobble}{false}}{true}}{%
1181   {\immediate\write\minted@code{autogobble}}}%
1182 \immediate\closeout\minted@code
1183 \edef\minted@argone@esc{#1}%
1184 \StrSubstitute{\minted@argone@esc}{\@backslashchar}{\@backslashchar\@ba
1185 \StrSubstitute{\minted@argone@esc}{"}{\@backslashchar"}[\minted@argone@
1186 \edef\minted@tmpfname@esc{\minted@outputdir\minted@jobname}%
1187 \StrSubstitute{\minted@tmpfname@esc}{\@backslashchar}{\@backslashchar\@
1188 \StrSubstitute{\minted@tmpfname@esc}{"}{\@backslashchar"}[\minted@tmpfn
1189 %Cheating a little here by using ASCII codes to write '{' and '`'
1190 %in the Python code
1191 \def\minted@hashcmd{%
1192   \detokenize{python -c "import hashlib; import os;
1193     hasher = hashlib.shal();
1194     f = open(os.path.expanduser(os.path.expandvars("\)\minted@tmpfname@
1195     hasher.update(f.read());
1196     f.close();
1197     f = open(os.path.expanduser(os.path.expandvars("\)\minted@argone@es
1198     hasher.update(f.read());
1199     f.close();
1200     f = open(os.path.expanduser(os.path.expandvars("\)\minted@tmpfname@
1201     macro = "\"\edef\minted@hash\" + chr(123) + hasher.hexdigest() + c
1202     f.write("\"makeatletter\" + macro + "\"makeatother\endinput\n\"")
1203     f.close();"}}%
1204 \ShellEscape{\minted@hashcmd}%
1205 \minted@input{\minted@outputdir\minted@jobname.mintedmd5}%
1206 \else
1207   \ifthenelse{\equal{\minted@get@opt{autogobble}{false}}{true}}{%
1208     {\edef\minted@hash{\mdfivesum file {#1}%
1209       \mdfivesum{\minted@cmd autogobble}}}%
1210     {\edef\minted@hash{\mdfivesum file {#1}%
1211       \mdfivesum{\minted@cmd}}}%
1212   \fi
1213 \fi
1214 \edef\minted@infile{\minted@cachedir/\minted@hash.pygtex}%
1215 \IfFileExists{\minted@infile}{}{%
1216   \ifthenelse{\equal{\minted@get@opt{autogobble}{false}}{true}}{%
1217     \edef\minted@argone@esc{#1}%
1218     \StrSubstitute{\minted@argone@esc}{\@backslashchar}{\@backslashchar\@ba
1219     \StrSubstitute{\minted@argone@esc}{"}{\@backslashchar"}[\minted@argone@
1220     \edef\minted@tmpfname@esc{\minted@outputdir\minted@jobname}%
1221     \StrSubstitute{\minted@tmpfname@esc}{\@backslashchar}{\@backslashchar\@
1222     \StrSubstitute{\minted@tmpfname@esc}{"}{\@backslashchar"}[\minted@tmpfn
1223     %Need a version of open() that supports encoding under Python 2
1224     \edef\minted@autogobblecmd{%
1225       \detokenize{python -c "import sys; import os;
1226       import textwrap;
1227       from io import open;

```



```

1228         f = open(os.path.expanduser(os.path.expandvars("\}"\minted@argone@esc\
1229         t = f.read());
1230         f.close();
1231         f = open(os.path.expanduser(os.path.expandvars("\}"\minted@tmpfname@esc\
1232         f.write(textwrap.dedent(t));
1233         f.close();"%
1234     }%
1235     \ShellEscape{\minted@autogobblecmd}}}%
1236     \ShellEscape{\minted@cmd}}%
1237 \fi
1238 \ifthenelse{\boolean{minted@finalizcache}}%
1239 {%
1240     \edef\minted@cachefilename{listing\arabic{minted@pygmentizecounter}.pygte
1241     \edef\minted@actualinfile{\minted@cachedir/\minted@cachefilename}%
1242     \ifwindows
1243         \StrSubstitute{\minted@infile}{/}{\@backslashchar}[\minted@infile@window
1244         \StrSubstitute{\minted@actualinfile}{/}{\@backslashchar}[\minted@actual
1245         \ShellEscape{move /y \minted@infile@windows\space\minted@actualinfile@w
1246     \else
1247         \ShellEscape{mv -f \minted@infile\space\minted@actualinfile}%
1248     \fi
1249     \let\minted@infile\minted@actualinfile
1250     \expandafter\minted@addcachefile\expandafter{\minted@cachefilename}%
1251 }%
1252 \ifthenelse{\boolean{minted@frozenscache}}%
1253 {%
1254     \edef\minted@cachefilename{listing\arabic{minted@pygmentizecounter}.pyg
1255     \edef\minted@infile{\minted@cachedir/\minted@cachefilename}%
1256     \expandafter\minted@addcachefile\expandafter{\minted@cachefilename}}%
1257     {\expandafter\minted@addcachefile\expandafter{\minted@hash.pygtex}}%
1258 }%
1259 \minted@inputpyg}%
1260 {%
1261 \ifthenelse{\equal{\minted@get@opt{autogobble}{false}}{true}}{%
1262     \edef\minted@argone@esc{\#1}%
1263     \StrSubstitute{\minted@argone@esc}{\@backslashchar}{\@backslashchar\@backsl
1264     \StrSubstitute{\minted@argone@esc}{"}{\@backslashchar"}[\minted@argone@esc]
1265     \edef\minted@tmpfname@esc{\minted@outputdir\minted@jobname}%
1266     \StrSubstitute{\minted@tmpfname@esc}{\@backslashchar}{\@backslashchar\@back
1267     \StrSubstitute{\minted@tmpfname@esc}{"}{\@backslashchar"}[\minted@tmpfname@
1268     %Need a version of open() that supports encoding under Python 2
1269     \edef\minted@autogobblecmd{%
1270         \detokenize{python -c "import sys; import os;
1271         import textwrap;
1272         from io import open;
1273         f = open(os.path.expanduser(os.path.expandvars("\}"\minted@argone@esc\deto
1274         t = f.read();
1275         f.close();
1276         f = open(os.path.expanduser(os.path.expandvars("\}"\minted@tmpfname@esc.py
1277         f.write(textwrap.dedent(t));

```

```

1278         f.close();"%
1279     }%
1280     \ShellEscape{\minted@autogobblecmd}}}%
1281     \ShellEscape{\minted@cmd}%
1282     \minted@inputpyg}%
1283 }

```

`\minted@inputpyg` For increased clarity, the actual `\input` process is separated out into its own macro.

A check is performed to make sure that style macros exist. This is done here, rather than when a style is set, so that creating the style macros is done as late as possible in case a custom `pygmentize` is in use via `\MintedPygmentize`. At the last possible moment, `\PYG` is `\let` to `\PYG<style>`. All modifications to the style macro for breaking are made to `\PYG<style>` rather than `\PYG`, so that the `\leting` that must ultimately take place will indeed do what is intended.

The `bgcolor` option needs to be dealt with in different ways depending on whether we are using `\mintinline`. It is simplest to apply this option here, so that the macro redefinitions may be local and thus do not need to be manually reset later. `\FV@Space` is also patched for math mode, so that space characters will vanish rather than appear as literal spaces within math mode. To simplify the logic, `breakbytoken` is turned on if `breakbytokenanywhere` is on.

```

1284 \def\FV@SpaceMMode{ }
1285 \def\minted@BreakBeforePrep@extension{%
1286   \ifcsname FV@BreakBefore@Token\@backslashchar\endcsname
1287     \@namedef{FV@BreakBefore@Token\detokenize{\PYGZbs}}}%
1288   \fi
1289   \ifcsname FV@BreakBefore@Token\FV@underscorechar\endcsname
1290     \@namedef{FV@BreakBefore@Token\detokenize{\PYGZus}}}%
1291   \fi
1292   \ifcsname FV@BreakBefore@Token\@charlb\endcsname
1293     \@namedef{FV@BreakBefore@Token\detokenize{\PYGZob}}}%
1294   \fi
1295   \ifcsname FV@BreakBefore@Token\@charrb\endcsname
1296     \@namedef{FV@BreakBefore@Token\detokenize{\PYGZcb}}}%
1297   \fi
1298   \ifcsname FV@BreakBefore@Token\detokenize{^}\endcsname
1299     \@namedef{FV@BreakBefore@Token\detokenize{\PYGZca}}}%
1300   \fi
1301   \ifcsname FV@BreakBefore@Token\FV@ampchar\endcsname
1302     \@namedef{FV@BreakBefore@Token\detokenize{\PYGZam}}}%
1303   \fi
1304   \ifcsname FV@BreakBefore@Token\detokenize{<}\endcsname
1305     \@namedef{FV@BreakBefore@Token\detokenize{\PYGZlt}}}%
1306   \fi
1307   \ifcsname FV@BreakBefore@Token\detokenize{>}\endcsname
1308     \@namedef{FV@BreakBefore@Token\detokenize{\PYGZgt}}}%
1309   \fi

```

```

1310 \ifcsname FV@BreakBefore@Token\FV@hashchar\endcsname
1311 \ifcsname FV@BreakBefore@Token\FV@percentchar\endcsname
1312 \ifcsname FV@BreakBefore@Token\FV@dollarchar\endcsname
1313 \ifcsname FV@BreakBefore@Token\FV@tildechar\endcsname
1314 \ifcsname FV@BreakBefore@Token\FV@underscorechar\endcsname
1315 \ifcsname FV@BreakBefore@Token\FV@ampchar\endcsname
1316 \ifcsname FV@BreakBefore@Token\FV@backslashchar\endcsname
1317 \ifcsname FV@BreakBefore@Token\FV@charlb\endcsname
1318 \ifcsname FV@BreakBefore@Token\FV@charrb\endcsname
1319 \ifcsname FV@BreakBefore@Token\FV@asciicircum\endcsname
1320 \ifcsname FV@BreakBefore@Token\FV@asciitilde\endcsname
1321 \ifcsname FV@BreakBefore@Token\FV@asciicaron\endcsname
1322 \ifcsname FV@BreakBefore@Token\FV@asciigrave\endcsname
1323 \ifcsname FV@BreakBefore@Token\FV@asciiering\endcsname
1324 \ifcsname FV@BreakBefore@Token\FV@asciitilde\endcsname
1325 \ifcsname FV@BreakBefore@Token\FV@asciicaron\endcsname
1326 \ifcsname FV@BreakBefore@Token\FV@asciigrave\endcsname
1327 \ifcsname FV@BreakBefore@Token\FV@asciiering\endcsname
1328 \ifcsname FV@BreakBefore@Token\FV@asciitilde\endcsname
1329 \ifcsname FV@BreakBefore@Token\FV@asciicaron\endcsname
1330 \ifcsname FV@BreakBefore@Token\FV@asciigrave\endcsname
1331 \ifcsname FV@BreakBefore@Token\FV@asciiering\endcsname
1332 \ifcsname FV@BreakBefore@Token\FV@asciitilde\endcsname
1333 \ifcsname FV@BreakBefore@Token\FV@asciicaron\endcsname
1334 \ifcsname FV@BreakBefore@Token\FV@asciigrave\endcsname
1335 \ifcsname FV@BreakBefore@Token\FV@asciiering\endcsname
1336 \ifcsname FV@BreakBefore@Token\FV@asciitilde\endcsname
1337 \ifcsname FV@BreakBefore@Token\FV@asciicaron\endcsname
1338 \ifcsname FV@BreakBefore@Token\FV@asciigrave\endcsname
1339 \ifcsname FV@BreakBefore@Token\FV@asciiering\endcsname
1340 }
1341 \def\minted@BreakAfter@Prep@extension{%
1342 \ifcsname FV@BreakAfter@Token\FV@backslashchar\endcsname
1343 \ifcsname FV@BreakAfter@Token\FV@percentchar\endcsname
1344 \ifcsname FV@BreakAfter@Token\FV@dollarchar\endcsname
1345 \ifcsname FV@BreakAfter@Token\FV@tildechar\endcsname
1346 \ifcsname FV@BreakAfter@Token\FV@underscorechar\endcsname
1347 \ifcsname FV@BreakAfter@Token\FV@ampchar\endcsname
1348 \ifcsname FV@BreakAfter@Token\FV@backslashchar\endcsname
1349 \ifcsname FV@BreakAfter@Token\FV@charlb\endcsname
1350 \ifcsname FV@BreakAfter@Token\FV@charrb\endcsname
1351 \ifcsname FV@BreakAfter@Token\FV@asciicircum\endcsname
1352 \ifcsname FV@BreakAfter@Token\FV@asciitilde\endcsname
1353 \ifcsname FV@BreakAfter@Token\FV@asciicaron\endcsname
1354 \ifcsname FV@BreakAfter@Token\FV@asciigrave\endcsname
1355 \ifcsname FV@BreakAfter@Token\FV@asciiering\endcsname
1356 \ifcsname FV@BreakAfter@Token\FV@asciitilde\endcsname
1357 \ifcsname FV@BreakAfter@Token\FV@asciicaron\endcsname
1358 \ifcsname FV@BreakAfter@Token\FV@asciigrave\endcsname
1359 \ifcsname FV@BreakAfter@Token\FV@asciiering\endcsname

```

```

1360 \ifcsname FV@BreakAfter@Token\detokenize{<}\endcsname
1361 \ifnamedef{FV@BreakAfter@Token\detokenize{\PYGZlt}}{}%
1362 \fi
1363 \ifcsname FV@BreakAfter@Token\detokenize{>}\endcsname
1364 \ifnamedef{FV@BreakAfter@Token\detokenize{\PYGZgt}}{}%
1365 \fi
1366 \ifcsname FV@BreakAfter@Token\FV@hashchar\endcsname
1367 \ifnamedef{FV@BreakAfter@Token\detokenize{\PYGZsh}}{}%
1368 \fi
1369 \ifcsname FV@BreakAfter@Token\@percentchar\endcsname
1370 \ifnamedef{FV@BreakAfter@Token\detokenize{\PYGZpc}}{}%
1371 \fi
1372 \ifcsname FV@BreakAfter@Token\FV@dollarchar\endcsname
1373 \ifnamedef{FV@BreakAfter@Token\detokenize{\PYGZdl}}{}%
1374 \fi
1375 \ifcsname FV@BreakAfter@Token\detokenize{-}\endcsname
1376 \ifnamedef{FV@BreakAfter@Token\detokenize{\PYGZhy}}{}%
1377 \fi
1378 \ifcsname FV@BreakAfter@Token\detokenize{'}\endcsname
1379 \ifnamedef{FV@BreakAfter@Token\detokenize{\PYGZsq}}{}%
1380 \fi
1381 \ifcsname FV@BreakAfter@Token\detokenize{"}\endcsname
1382 \ifnamedef{FV@BreakAfter@Token\detokenize{\PYGZdq}}{}%
1383 \fi
1384 \ifcsname FV@BreakAfter@Token\FV@tildechar\endcsname
1385 \ifnamedef{FV@BreakAfter@Token\detokenize{\PYGZti}}{}%
1386 \fi
1387 \ifcsname FV@BreakAfter@Token\detokenize{@}\endcsname
1388 \ifnamedef{FV@BreakAfter@Token\detokenize{\PYGZat}}{}%
1389 \fi
1390 \ifcsname FV@BreakAfter@Token\detokenize{[]}\endcsname
1391 \ifnamedef{FV@BreakAfter@Token\detokenize{\PYGZlb}}{}%
1392 \fi
1393 \ifcsname FV@BreakAfter@Token\detokenize{[]}\endcsname
1394 \ifnamedef{FV@BreakAfter@Token\detokenize{\PYGZrb}}{}%
1395 \fi
1396 }
1397 \newcommand{\minted@inputpyg}{%
1398 \minted@checkstyle{\minted@get@opt{style}{default}}%
1399 \let\FV@BreakBeforePrep@orig\FV@BreakBeforePrep
1400 \def\FV@BreakBeforePrep{%
1401 \FV@BreakBeforePrep@orig\minted@BreakBeforePrep@extension}%
1402 \let\FV@BreakAfterPrep@orig\FV@BreakAfterPrep
1403 \def\FV@BreakAfterPrep{%
1404 \FV@BreakAfterPrep@orig\minted@BreakAfterPrep@extension}%
1405 \everymath\expandafter{\the\everymath\let\FV@Space\FV@SpaceMMode}%
1406 \ifthenelse{\equal{\minted@get@opt{breakbytokenanywhere}}{false}}{true}}%
1407 {\setkeys{minted@opt@cmd}{breakbytoken=true}}}%
1408 \ifthenelse{\boolean{FV@BreakAnywhere}}%
1409 {\expandafter\let\expandafter\minted@orig\PYG@breakanywhere%

```

```

1410         \csname PYG\minted@get@opt{style}{default}\endcsname
1411     \expandafter\def\csname PYG\minted@get@opt{style}{default}\endcsname##1##2{%
1412         \minted@orig@PYG@breakanywhere{##1}%
1413         {\FancyVerbBreakStart##2\FancyVerbBreakStop}}}%
1414 \ifx\FV@BreakBefore\@empty
1415     \ifx\FV@BreakAfter\@empty
1416     \else
1417         \expandafter\let\expandafter\minted@orig@PYG@breakbeforeafter%
1418         \csname PYG\minted@get@opt{style}{default}\endcsname
1419         \expandafter\def\csname PYG\minted@get@opt{style}{default}\endcsname##1##2{%
1420             \minted@orig@PYG@breakbeforeafter{##1}%
1421             {\FancyVerbBreakStart##2\FancyVerbBreakStop}}}%
1422     \fi
1423 \else
1424     \expandafter\let\expandafter\minted@orig@PYG@breakbeforeafter%
1425     \csname PYG\minted@get@opt{style}{default}\endcsname
1426     \expandafter\def\csname PYG\minted@get@opt{style}{default}\endcsname##1##2{%
1427         \minted@orig@PYG@breakbeforeafter{##1}%
1428         {\FancyVerbBreakStart##2\FancyVerbBreakStop}}}%
1429 \fi
1430 \ifthenelse{\boolean{minted@isinline}}%
1431 {\ifthenelse{\equal{\minted@get@opt{breaklines}{false}}{true}}%
1432 {\let\FV@BeginVBox\relax
1433  \let\FV@EndVBox\relax
1434  \def\FV@BProcessLine##1{\FancyVerbFormatLine{##1}}%
1435  \ifthenelse{\equal{\minted@get@opt{breakbytoken}{false}}{true}}%
1436  {\minted@inputpyg@breakbytoken
1437   \minted@inputpyg@inline}%
1438  {\minted@inputpyg@inline}}%
1439 {\minted@inputpyg@inline}}%
1440 {\ifthenelse{\equal{\minted@get@opt{breaklines}{false}}{true}}%
1441 {\ifthenelse{\equal{\minted@get@opt{breakbytoken}{false}}{true}}%
1442 {\minted@inputpyg@breakbytoken
1443  \minted@inputpyg@block}%
1444 {\minted@inputpyg@block}}%
1445 {\minted@inputpyg@block}}%
1446 }
1447 \def\minted@inputpyg@breakbytoken{%
1448     \expandafter\let\expandafter\minted@orig@PYG@breakbytoken%
1449     \csname PYG\minted@get@opt{style}{default}\endcsname
1450     \ifthenelse{\equal{\minted@get@opt{breakbytokenanywhere}{false}}{true}}%
1451     {\let\minted@orig@allowbreak\allowbreak
1452      \def\allowbreak{\let\allowbreak\minted@orig@allowbreak}%
1453      \expandafter\def\csname PYG\minted@get@opt{style}{default}\endcsname##1##2{%
1454          \allowbreak}\leavevmode\hbox{\minted@orig@PYG@breakbytoken{##1}{##2}}}%
1455      {\expandafter\def\csname PYG\minted@get@opt{style}{default}\endcsname##1##2{%
1456          \leavevmode\hbox{\minted@orig@PYG@breakbytoken{##1}{##2}}}%
1457      }
1458 \def\minted@inputpyg@inline{%
1459     \expandafter\let\expandafter\PYG%

```

```

1460 \csname PYG\minted@get@opt{style}{default}\endcsname
1461 \ifthenelse{\equal{\minted@get@opt{bgcolor}}{}}{}}}%
1462 {\minted@input{\minted@outputdir\minted@infile}}}%
1463 {\colorbox{\minted@get@opt{bgcolor}}{}}}%
1464 \minted@input{\minted@outputdir\minted@infile}}}%
1465 }
1466 \def\minted@inputpyg@block{%
1467 \expandafter\let\expandafter\PYG%
1468 \csname PYG\minted@get@opt{style}{default}\endcsname
1469 \ifthenelse{\equal{\minted@get@opt{bgcolor}}{}}{}}}%
1470 {\minted@input{\minted@outputdir\minted@infile}}}%
1471 {\begin{minted@colorbg}{\minted@get@opt{bgcolor}}{}}}%
1472 \minted@input{\minted@outputdir\minted@infile}%
1473 \end{minted@colorbg}}}%

```

We need a way to have line counters on a per-language basis.

`\minted@langlinenoson`

```

1474 \newcommand{\minted@langlinenoson}{%
1475 \ifcsname c@minted@lang\minted@lang\endcsname\else
1476 \newcounter{minted@lang\minted@lang}%
1477 \fi
1478 \setcounter{minted@FancyVerbLineTemp}{\value{FancyVerbLine}}%
1479 \setcounter{FancyVerbLine}{\value{minted@lang\minted@lang}}%
1480 }

```

`\minted@langlinenosoff`

```

1481 \newcommand{\minted@langlinenosoff}{%
1482 \setcounter{minted@lang\minted@lang}{\value{FancyVerbLine}}%
1483 \setcounter{FancyVerbLine}{\value{minted@FancyVerbLineTemp}}%
1484 }

```

Disable the language-specific settings if the package option isn't used.

```

1485 \ifthenelse{\boolean{minted@langlinenos}}{}}{%
1486 \let\minted@langlinenoson\relax
1487 \let\minted@langlinenosoff\relax
1488 }

```

9.10 Public API

`\setminted` Set global or language-level options.

```

1489 \newcommand{\setminted}[2][{}]{%
1490 \ifthenelse{\equal{#1}{}}{}}%
1491 {\setkeys{minted@opt@g}{#2}}%

```

```

1492     {\minted@configlang{#1}%
1493      \setkeys{minted@opt@lang}{#2}}}
```

`\setmintedinline` Set global or language-level options, but only for inline (`\mintinline`) content. These settings will override the corresponding `\setminted` settings.

```

1494 \newcommand{\setmintedinline}[2][]{%
1495   \ifthenelse{\equal{#1}{}}{%
1496     {\setkeys{minted@opt@g@i}{#2}}%
1497     {\minted@configlang{#1}%
1498      \setkeys{minted@opt@lang@i}{#2}}}
```

Now that the settings macros exist, we go ahead and create any needed defaults.

```

1499 \setmintedinline[php]{startinline=true}
```

`\usemintedstyle` Set style. This is a holdover from version 1, since `\setminted` can now accomplish this, and a hierarchy of style settings are now possible.

```

1500 \newcommand{\usemintedstyle}[2][]{\setminted[#1]{style=#2}}
```

`\minted@defwhitespace@retok` The `\mint` and `\mintinline` commands need to be able to retokenize the code they collect, particularly in draft mode. Retokenization involves expansion combined with `\scantokens`, with active space and tab characters. The active characters need to expand to the appropriate `fancyvrb` macros, but the macros themselves should not be expanded. We need a macro that will accomplish the appropriate definitions.

```

1501 \begingroup
1502 \catcode`\_=\active
1503 \catcode`\^^I=\active
1504 \gdef\minted@defwhitespace@retok{\def _{\noexpand\FV@Space}\def^^I{\noexpand\FV@Tab}
1505 \endgroup
```

`\minted@writecmdcode` The `\mintinline` and `\mint` commands will need to write the code they capture to a temporary file for highlighting. It will be convenient to be able to accomplish this via a simple macro, since that makes it simpler to deal with any expansion of what is to be written. This isn't needed for the minted environment, because the (patched) `VerbatimOut` is used.

```

1506 \newcommand{\minted@writecmdcode}[1]{%
1507   \immediate\openout\minted@code\minted@jobname.pyg\relax
1508   \immediate\write\minted@code{\detokenize{#1}}%
1509   \immediate\closeout\minted@code}
```

`\mintinline` Define an inline command. This requires some catcode acrobatics. The typical verbatim methods are not used. Rather, a different approach is taken that is

generally more robust when used within other commands (for example, when used in footnotes).

Pygments saves code wrapped in a `Verbatim` environment. Getting the inline command to work correctly require redefining `Verbatim` to be `BVerbatim` temporarily. This approach would break if `BVerbatim` were ever redefined elsewhere.

Everything needs to be within a `\begingroup...\endgroup` to prevent settings from escaping.

In the case of draft mode, the code is captured and retokenized. Then the internals of `fancyvrb` are used to emulate `SaveVerbatim`, so that `\BUseVerbatim` may be employed.

The `FancyVerbLine` counter is altered somehow within `\minted@pygmentize`, so we protect against this.

```

1510 \newrobustcmd{\mintinline}[2][\]{%
1511   \begingroup
1512   \setboolean{minted@isinline}{true}%
1513   \minted@configlang{#2}%
1514   \setkeys{minted@opt@cmd}{#1}%
1515   \minted@fvset
1516   \begingroup
1517   \let\do\@makeother\dospecials
1518   \catcode`\{=1
1519   \catcode`\}=2
1520   \catcode`\^^I=\active
1521   \@ifnextchar\bgroup
1522     {\minted@inline@iii}%
1523     {\catcode`\{=12\catcode`\}=12
1524       \minted@inline@i}}
1525 \def\minted@inline@i#1{%
1526   \endgroup
1527   \def\minted@inline@ii##1#1{%
1528     \minted@inline@iii{##1}}%
1529   \begingroup
1530   \let\do\@makeother\dospecials
1531   \catcode`\^^I=\active
1532   \minted@inline@ii}
1533 \ifthenelse{\boolean{minted@draft}}{%
1534   {\newcommand{\minted@inline@iii}[1]{%
1535     \endgroup
1536     \begingroup
1537     \minted@defwhitespace@retok
1538     \everyeof{\noexpand}%
1539     \endlinechar-1\relax
1540     \let\do\@makeother\dospecials
1541     \catcode`\ =\active
1542     \catcode`\^^I=\active
1543     \xdef\minted@tmp{\scantokens{#1}}}%

```



```

1544 \endgroup
1545 \let\FV@Line\minted@tmp
1546 \def\FV@SV@minted@tmp{%
1547   \FV@Gobble
1548   \expandafter\FV@ProcessLine\expandafter{\FV@Line}}%
1549 \ifthenelse{\equal{\minted@get@opt{breaklines}{false}}{true}}{%
1550   {\let\FV@BeginVBox\relax
1551     \let\FV@endVBox\relax
1552     \def\FV@BProcessLine##1{\FancyVerbFormatLine{##1}}%
1553     \BUseVerbatim{minted@tmp}}%
1554   {\BUseVerbatim{minted@tmp}}%
1555 \endgroup}}%
1556 {\newcommand{\minted@inline@iii}[1]{%
1557   \endgroup
1558   \minted@writecmdcode{#1}%
1559   \RecustomVerbatimEnvironment{Verbatim}{BVerbatim}{}%
1560   \setcounter{minted@FancyVerbLineTemp}{\value{FancyVerbLine}}%
1561   \minted@pygmentize{\minted@lang}%
1562   \setcounter{FancyVerbLine}{\value{minted@FancyVerbLineTemp}}%
1563   \endgroup}}

```

`\mint` Highlight a small piece of verbatim code (a single line).

The draft version digs into a good deal of `fancyvrb` internals. We want to employ `\UseVerbatim`, and this requires assembling a macro equivalent to what `SaveVerbatim` would have created. Actually, this is superior to what `SaveVerbatim` would yield, because line numbering is handled correctly.

```

1564 \newrobustcmd{\mint}[2][{}]{%
1565   \begingroup
1566   \minted@configlang{#2}%
1567   \setkeys{minted@opt@cmd}{#1}%
1568   \minted@fvset
1569   \begingroup
1570   \let\do\@makeother\dospecials
1571   \catcode`\{=1
1572   \catcode`\}=2
1573   \catcode`\^^I=\active
1574   \@ifnextchar\bgroup
1575     {\mint@iii}%
1576     {\catcode`\{=12\catcode`\}=12
1577       \mint@i}}
1578 \def\mint@i#1{%
1579   \endgroup
1580   \def\mint@ii##1#1{%
1581     \mint@iii{##1}}%
1582   \begingroup
1583   \let\do\@makeother\dospecials
1584   \catcode`\^^I=\active
1585   \mint@ii}

```

```

1586 \ifthenelse{\boolean{minted@draft}}{%
1587   {\newcommand{\mint@iii}[1]{%
1588     \endgroup
1589     \begingroup
1590     \minted@defwhitespace@retok
1591     \everyeof{\noexpand}%
1592     \endlinechar-1\relax
1593     \let\do\@makeother\dospecials
1594     \catcode`\ =\active
1595     \catcode`\^^I=\active
1596     \xdef\minted@tmp{\scantokens{#1}}%
1597     \endgroup
1598     \let\FV@Line\minted@tmp
1599     \def\FV@SV@minted@tmp{%
1600       \FV@CodeLineNo=1\FV@StepLineNo
1601       \FV@Gobble
1602       \expandafter\FV@ProcessLine\expandafter{\FV@Line}}%
1603     \minted@langlinenoson
1604     \UseVerbatim{minted@tmp}%
1605     \minted@langlinenosoff
1606     \endgroup}}%
1607   {\newcommand{\mint@iii}[1]{%
1608     \endgroup
1609     \minted@writcmdcode{#1}%
1610     \minted@langlinenoson
1611     \minted@pygmentize{\minted@lang}%
1612     \minted@langlinenosoff
1613     \endgroup}}

```

`minted` Highlight a longer piece of code inside a verbatim environment.

```

1614 \ifthenelse{\boolean{minted@draft}}{%
1615   {\newenvironment{minted}[2][]
1616     {\VerbatimEnvironment
1617       \minted@configlang{#2}%
1618       \setkeys{minted@opt@cmd}{#1}%
1619       \minted@fvset
1620       \minted@langlinenoson
1621       \begin{Verbatim}}%
1622     {\end{Verbatim}%
1623       \minted@langlinenosoff}}%
1624   {\newenvironment{minted}[2][]
1625     {\VerbatimEnvironment
1626       \let\FVB@VerbatimOut\minted@FVB@VerbatimOut
1627       \let\FVE@VerbatimOut\minted@FVE@VerbatimOut
1628       \minted@configlang{#2}%
1629       \setkeys{minted@opt@cmd}{#1}%
1630       \minted@fvset
1631       \begin{VerbatimOut}[codes={\catcode`\^^I=12}]{\minted@jobname.pyg}}%
1632     {\end{VerbatimOut}%

```

```

1633 \minted@langlinenoson
1634 \minted@pygmentize{\minted@lang}%
1635 \minted@langlinenosoff}

```

`\inputminted` Highlight an external source file.

```

1636 \ifthenelse{\boolean{minted@draft}}{%
1637   {\newcommand{\inputminted}[3][[]]{%
1638     \begingroup
1639     \minted@configlang{#2}%
1640     \setkeys{minted@opt@cmd}{#1}%
1641     \minted@fvset
1642     \VerbatimInput{#3}%
1643     \endgroup}}%
1644   {\newcommand{\inputminted}[3][[]]{%
1645     \begingroup
1646     \minted@configlang{#2}%
1647     \setkeys{minted@opt@cmd}{#1}%
1648     \minted@fvset
1649     \minted@pygmentize[#3]{#2}%
1650     \endgroup}}

```

9.11 Command shortcuts

We allow the user to define shortcuts for the highlighting commands.

`\newminted` Define a new language-specific alias for the `minted` environment.

```

1651 \newcommand{\newminted}[3][[]]{

```

First, we look whether a custom environment name was given as the first optional argument. If that’s not the case, construct it from the language name (append “code”).

```

1652 \ifthenelse{\equal{#1}{}}{
1653   {\def\minted@envname{#2code}}
1654   {\def\minted@envname{#1}}

```

Now, we define two environments. The first takes no further arguments. The second, starred version, takes an extra argument that specifies option overrides.

```

1655 \newenvironment{\minted@envname}
1656   {\VerbatimEnvironment
1657    \begin{minted}[#3]{#2}}
1658   {\end{minted}}
1659 \newenvironment{\minted@envname *}[1]
1660   {\VerbatimEnvironment\begin{minted}[#3,##1]{#2}}
1661   {\end{minted}}

```

`\newmint` Define a new language-specific alias for the `\mint` short form.

```
1662 \newcommand{\newmint}[3][]{
```

Same as with `\newminted`, look whether an explicit name is provided. If not, take the language name as command name.

```
1663 \ifthenelse{\equal{#1}{} }{
1664   {\def\minted@shortname{#2}}
1665   {\def\minted@shortname{#1}}
```

And define the macro.

```
1666 \expandafter\newcommand\csname\minted@shortname\endcsname[2][]{
1667   \mint[#3,##1]{#2}##2}}
```

`\newmintedfile` Define a new language-specific alias for `\inputminted`.

```
1668 \newcommand{\newmintedfile}[3][]{
```

Here, the default macro name (if none is provided) appends “file” to the language name.

```
1669 \ifthenelse{\equal{#1}{} }{
1670   {\def\minted@shortname{#2file}}
1671   {\def\minted@shortname{#1}}
```

...and define the macro.

```
1672 \expandafter\newcommand\csname\minted@shortname\endcsname[2][]{
1673   \inputminted[#3,##1]{#2}##2}}
```

`\newmintinline` Define an alias for `\mintinline`.

As is usual with inline commands, a little catcode trickery must be employed.

```
1674 \newcommand{\newmintinline}[3][]{%
1675 \ifthenelse{\equal{#1}{} }{%
1676   {\def\minted@shortname{#2inline}}%
1677   {\def\minted@shortname{#1}}%
1678 \expandafter\newrobustcmd\csname\minted@shortname\endcsname{%
1679   \begingroup
1680   \let\do\@makeother\dospecials
1681   \catcode`\{=1
1682   \catcode`\}=2
1683   \@ifnextchar[{\endgroup\minted@inliner[#3][#2]}%
1684   {\endgroup\minted@inliner[#3][#2] []}%
1685   \def\minted@inliner[##1][##2][##3]{\mintinline[##1,##3]{##2}}%
1686 }
```

9.12 Float support

`listing` Define a new floating environment to use for floated listings. This is defined conditionally based on the `newfloat` package option.

```

1687 \ifthenelse{\boolean{minted@newfloat}}%
1688   {\@ifundefined{minted@float@within}%
1689     {\DeclareFloatingEnvironment[fileext=lol,placement=h]{listing}}%
1690     {\def\minted@tmp#1{%
1691       \DeclareFloatingEnvironment[fileext=lol,placement=h, within=#1]{listing}}%
1692       \expandafter\minted@tmp\expandafter{\minted@float@within}}}%
1693   {\@ifundefined{minted@float@within}%
1694     {\newfloat{listing}{h}{lol}}%
1695     {\newfloat{listing}{h}{lol}[\minted@float@within]}}
```

The following macros only apply when `listing` is created with the `float` package. When `listing` is created with `newfloat`, its properties should be modified using `newfloat`'s `\SetupFloatingEnvironment`.

```

1696 \ifminted@newfloat\else
```

`\listingcaption` The name that is displayed before each individual listings caption and its number. The macro `\listingscaption` can be redefined by the user.

```

1697 \newcommand{\listingscaption}{Listing}
```

The following definition should not be changed by the user.

```

1698 \floatname{listing}{\listingscaption}
```

`\listoflistingscaption` The caption that is displayed for the list of listings.

```

1699 \newcommand{\listoflistingscaption}{List of Listings}
```

`\listoflistings` Used to produce a list of listings (like `\listoffigures` etc.). This may well clash with other packages (for example, `listings`) but we choose to ignore this since these two packages shouldn't be used together in the first place.

```

1700 \providecommand{\listoflistings}{\listof{listing}{\listoflistingscaption}}
```

Again, the preceding macros only apply when `float` is used to create listings, so we need to end the conditional.

```

1701 \fi
```

9.13 Epilogue

Check whether LaTeX was invoked with `-shell-escape` option, set the default style, and make sure `pygmentize` exists. Checking for `pygmentize` must wait until the end of the preamble, in case it is specified via `\MintedPygmentize` (which would typically be after the package is loaded).

```
1702 \AtEndOfPackage{%
1703   \ifthenelse{\boolean{minted@draft}}{%
1704     {}%
1705     {%
1706       \ifthenelse{\boolean{minted@frozenscache}}{}{%
1707         \ifnum\pdf@shellescape=1\relax\else
1708           \PackageError{minted}%
1709             {You must invoke LaTeX with the
1710              -shell-escape flag}%
1711             {Pass the -shell-escape flag to LaTeX. Refer to the minted.sty
1712              documentation for more information.}%
1713           \fi}%
1714     }%
1715   }
1716 \AtEndPreamble{%
1717   \ifthenelse{\boolean{minted@draft}}{%
1718     {}%
1719     {%
1720       \ifthenelse{\boolean{minted@frozenscache}}{}{%
1721         \TestAppExists{\MintedPygmentize}%
1722         \ifAppExists\else
1723           \PackageError{minted}%
1724             {You must have 'pygmentize' installed
1725              to use this package}%
1726             {Refer to the installation instructions in the minted
1727              documentation for more information.}%
1728         \fi}%
1729     }%
1730   }
```

9.14 Final cleanup

Clean up temp files. What actually needs to be done depends on caching and engine.

```
1731 \AfterEndDocument{%
1732   \ifthenelse{\boolean{minted@draft}}{%
1733     {}%
1734     {\ifthenelse{\boolean{minted@frozenscache}}{}%
1735      {}
1736      {\ifx\XeTeXinterchartoks\minted@undefined
```

```

1737     \else
1738         \DeleteFile[\minted@outputdir]{\minted@jobname.mintedcmd}%
1739         \DeleteFile[\minted@outputdir]{\minted@jobname.mintedmd5}%
1740     \fi
1741     \DeleteFile[\minted@outputdir]{\minted@jobname.pyg}%
1742     \DeleteFile[\minted@outputdir]{\minted@jobname.out.pyg}%
1743 }%
1744 }%
1745 }

```

10 Implementation of compatibility package

minted version 2 is designed to be completely compatible with version 1.7. All of the same options and commands still exist. As far as most users are concerned, the only difference should be the new commands and options.

However, minted 2 does require some additional packages compared to minted 1.7. More importantly, since minted 2 has almost completely new internal code, user code that accessed the internals of 1.7 will generally not work with 2.0, at least not without some modification. For these reasons, a copy of minted 1.7 is supplied as the package `minted1`. This is intended *only* for compatibility cases when using the current version is too inconvenient.

The code in `minted1` is an exact copy of minted version 1.7, except for two things: (1) the package has been renamed, and (2) code has been added that allows `minted1` to act as (impersonate) `minted`, so that it can cooperate with other packages that require `minted` to be loaded.⁹ When `minted1` is used, it must be loaded *before* any other packages that would require `minted`.

All modifications to the original minted 1.7 source are indicated with comments. All original code that has been replaced has been commented out rather than deleted. Any future modifications of `minted1` should *only* be for the purpose of allowing it to serve better as a drop-in compatibility substitute for the current release of `minted`.

```

1 \NeedsTeXFormat{LaTeX2e}
2 %%% Begin minted1 modification
3 %\ProvidesPackage{minted}[2011/09/17 v1.7 Yet another Pygments shim for LaTeX]
4 \ProvidesPackage{minted1}[2015/01/31 v1.0 minted 1.7 compatibility package]
5 %%% End minted1 modification
6 \RequirePackage{keyval}
7 \RequirePackage{fancyvrb}
8 \RequirePackage{xcolor}
9 \RequirePackage{float}
10 \RequirePackage{ifthen}

```

⁹The approach used for doing this is described at <http://tex.stackexchange.com/a/39418/10742>.

```

11 %%% Begin minted1 modification
12 \newboolean{mintedone@mintedloaded}
13 \@ifpackageloaded{minted}%
14 {\setboolean{mintedone@mintedloaded}{true}%
15 \PackageError{minted1}{The package "minted1" may not be loaded after
16 ^J"minted" has already been loaded--load "minted1" only for "minted"
17 ^Jversion 1.7 compatibility}%
18 {Load "minted1" only when "minted" version 1.7 compatibility is required}}%
19 {}
20 \ifmintedone@mintedloaded\else
21 \@namedef{ver@minted.sty}{2011/09/17 v1.7 Yet another Pygments shim for LaTeX}
22 \expandafter\let\expandafter\minted@tmp\csname opt@minted1.sty\endcsname
23 \expandafter\let\csname opt@minted.sty\endcsname\minted@tmp
24 \let\minted@tmp\relax
25 %%% End minted1 modification
26 \RequirePackage{calc}
27 \RequirePackage{ifplatform}
28 \DeclareOption{chapter}{\def\minted@float@within{chapter}}
29 \DeclareOption{section}{\def\minted@float@within{section}}
30 \ProcessOptions\relax
31 \ifwindows
32 \providecommand\DeleteFile[1]{\immediate\write18{del #1}}
33 \else
34 \providecommand\DeleteFile[1]{\immediate\write18{rm #1}}
35 \fi
36 \newboolean{AppExists}
37 \newcommand\TestAppExists[1]{
38 \ifwindows
39 \DeleteFile{\jobname.aex}
40 \immediate\write18{for \string^\@percentchar i in (#1.exe #1.bat #1.cmd)
41 do set >\jobname.aex <nul: /p x=\string^\@percentchar \string~$PATH:i>>\jobna
42 \newread\@appexistsfile
43 \immediate\openin\@appexistsfile\jobname.aex
44 \expandafter\def\expandafter\@tmp@cr\expandafter{\the\endlinechar}
45 \endlinechar=-1\relax
46 \readline\@appexistsfile to \@apppathifexists
47 \endlinechar=\@tmp@cr
48 \ifthenelse{\equal{\@apppathifexists}{}}
49 {\AppExistsfalse}
50 {\AppExiststrue}
51 \immediate\closein\@appexistsfile
52 \DeleteFile{\jobname.aex}
53 \immediate\typeout{file deleted}
54 \else
55 \immediate\write18{which #1 && touch \jobname.aex}
56 \IfFileExists{\jobname.aex}
57 {\AppExiststrue
58 \DeleteFile{\jobname.aex}}
59 {\AppExistsfalse}
60 \fi}

```



```

61 \newcommand\minted@resetoptions{}
62 \newcommand\minted@defopt[1]{
63   \expandafter\def\expandafter\minted@resetoptions\expandafter{%
64     \minted@resetoptions
65     \@namedef{minted@opt@#1}{}}
66 \newcommand\minted@opt[1]{
67   \expandafter\detokenize%
68   \expandafter\expandafter\expandafter{\csname minted@opt@#1\endcsname}}
69 \newcommand\minted@define@opt[3][]{
70   \minted@defopt{#2}
71   \ifthenelse{\equal{#1}{}}{
72     \define@key{minted@opt}{#2}{\@namedef{minted@opt@#2}{#3}}
73     {\define@key{minted@opt}{#2}[#1]{\@namedef{minted@opt@#2}{#3}}}
74 \newcommand\minted@define@switch[3][]{
75   \minted@defopt{#2}
76   \define@booleankey{minted@opt}{#2}
77   {\@namedef{minted@opt@#2}{#3}}
78   {\@namedef{minted@opt@#2}{#1}}
79 \minted@defopt{extra}
80 \newcommand\minted@define@extra[1]{
81   \define@key{minted@opt}{#1}{
82     \expandafter\def\expandafter\minted@opt@extra\expandafter{%
83       \minted@opt@extra,#1=#1}}
84 \newcommand\minted@define@extra@switch[1]{
85   \define@booleankey{minted@opt}{#1}
86   {\expandafter\def\expandafter\minted@opt@extra\expandafter{%
87     \minted@opt@extra,#1}}
88   {\expandafter\def\expandafter\minted@opt@extra\expandafter{%
89     \minted@opt@extra,#1=false}}
90 \minted@define@switch{texcl}{-P texcomments}
91 \minted@define@switch{mathescape}{-P mathescape}
92 \minted@define@switch{linenos}{-P linenos}
93 \minted@define@switch{startinline}{-P startinline}
94 \minted@define@switch[-P funcnamehighlighting=False]%
95   {funcnamehighlighting}{-P funcnamehighlighting}
96 \minted@define@opt{gobble}{-F gobble:n=#1}
97 \minted@define@opt{bgcolor}{#1}
98 \minted@define@extra{frame}
99 \minted@define@extra{framesep}
100 \minted@define@extra{framerule}
101 \minted@define@extra{rulecolor}
102 \minted@define@extra{numbersep}
103 \minted@define@extra{firstnumber}
104 \minted@define@extra{stepnumber}
105 \minted@define@extra{firstline}
106 \minted@define@extra{lastline}
107 \minted@define@extra{baselinestretch}
108 \minted@define@extra{xleftmargin}
109 \minted@define@extra{xrightmargin}
110 \minted@define@extra{fillcolor}

```

```

111 \minted@define@extra{tabsize}
112 \minted@define@extra{fontfamily}
113 \minted@define@extra{fontsize}
114 \minted@define@extra{fontshape}
115 \minted@define@extra{fontseries}
116 \minted@define@extra{formatcom}
117 \minted@define@extra{label}
118 \minted@define@extra@switch{numberblanklines}
119 \minted@define@extra@switch{showspaces}
120 \minted@define@extra@switch{resetmargins}
121 \minted@define@extra@switch{samepage}
122 \minted@define@extra@switch{showtabs}
123 \minted@define@extra@switch{obeytabs}
124 \newsavebox{\minted@bgbox}
125 \newenvironment{minted@colorbg}[1]{
126   \def\minted@bgcol{#1}
127   \noindent
128   \begin{lrbox}{\minted@bgbox}
129   \begin{minipage}{\linewidth-2\fbboxsep}
130   {\end{minipage}
131   \end{lrbox}%
132   \colorbox{\minted@bgcol}{\usebox{\minted@bgbox}}}}
133 \newwrite\minted@code
134 \newcommand\minted@savencode[1]{
135   \immediate\openout\minted@code\jobname.pyg
136   \immediate\write\minted@code{#1}
137   \immediate\closeout\minted@code}
138 \newcommand\minted@pygmentize[2][\jobname.pyg]{
139   \def\minted@cmd{pygmentize -l #2 -f latex -F tokenmerge
140     \minted@opt{gobble} \minted@opt{texcl} \minted@opt{mathescape}
141     \minted@opt{startinline} \minted@opt{funcnamehighlighting}
142     \minted@opt{linenos} -P "verboptions=\minted@opt{extra}"
143     -o \jobname.out.pyg #1}
144   \immediate\write18{\minted@cmd}
145   % For debugging, uncomment:
146   %\immediate\typeout{\minted@cmd}
147   \ifthenelse{\equal{\minted@opt@bgcolor}{}}{
148     {}
149     {\begin{minted@colorbg}{\minted@opt@bgcolor}}}
150   \input{\jobname.out.pyg}
151   \ifthenelse{\equal{\minted@opt@bgcolor}{}}{
152     {}
153     {\end{minted@colorbg}}}
154   \DeleteFile{\jobname.out.pyg}}
155 \newcommand\minted@usedefaultstyle{\usemintedstyle{default}}
156 \newcommand\usemintedstyle[1]{
157   \renewcommand\minted@usedefaultstyle{
158     \immediate\write18{pygmentize -S #1 -f latex > \jobname.pyg}
159     \input{\jobname.pyg}}
160 \newcommand\mint[3][]{}

```

```

161 \DefineShortVerb{#3}
162 \minted@resetoptions
163 \setkeys{minted@opt}{#1}
164 \SaveVerb[after save={
165   \UndefineShortVerb{#3}
166   \minted@savecode{\FV@SV@minted@verb}
167   \minted@pygmentize{#2}
168   \DeleteFile{\jobname.pyg}}]{minted@verb}{#3}
169 \newcommand\minted@proglang[1]{}
170 \newenvironment{minted}[2]{}
171 {\VerbatimEnvironment
172 \renewcommand{\minted@proglang}[1]{#2}
173 \minted@resetoptions
174 \setkeys{minted@opt}{#1}
175 \begin{VerbatimOut}[codes={\catcode\^^I=12}]{\jobname.pyg}}%
176 {\end{VerbatimOut}
177 \minted@pygmentize{\minted@proglang}}
178 \DeleteFile{\jobname.pyg}}
179 \newcommand\inputminted[3][]{
180 \minted@resetoptions
181 \setkeys{minted@opt}{#1}
182 \minted@pygmentize[#3]{#2}}
183 \newcommand\newminted[3][]{
184 \ifthenelse{\equal{#1}{} }{
185   {\def\minted@envname{#2code}}
186   {\def\minted@envname{#1}}
187 \newenvironment{\minted@envname}
188   {\VerbatimEnvironment\begin{minted}[#3]{#2}}
189   {\end{minted}}}
190 \newenvironment{\minted@envname *}[1]
191   {\VerbatimEnvironment\begin{minted}[#3,##1]{#2}}
192   {\end{minted}}}{
193 \newcommand\newmint[3][]{
194 \ifthenelse{\equal{#1}{} }{
195   {\def\minted@shortname{#2}}
196   {\def\minted@shortname{#1}}
197 \expandafter\newcommand\csname\minted@shortname\endcsname[2][]{
198   \mint[#3,##1]{#2}##2}}
199 \newcommand\newmintedfile[3][]{
200 \ifthenelse{\equal{#1}{} }{
201   {\def\minted@shortname{#2file}}
202   {\def\minted@shortname{#1}}
203 \expandafter\newcommand\csname\minted@shortname\endcsname[2][]{
204   \inputminted[#3,##1]{#2}{##2}}}
205 \@ifundefined{minted@float@within}
206 {\newfloat{listing}{h}{lol}}
207 {\newfloat{listing}{h}{lol}[minted@float@within]}
208 \newcommand\listingscaption{Listing}
209 \floatname{listing}{\listingscaption}
210 \newcommand\listoflistingscaption{List of listings}

```

```

211 \providecommand\listoflistings{\listof{listing}{\listoflistingscaption}}
212 \AtBeginDocument{
213   \minted@usedefaultstyle}
214 \AtEndOfPackage{
215   \ifnum\pdf@shellescape=1\relax\else
216     \PackageError{minted}
217       {You must invoke LaTeX with the
218         -shell-escape flag}
219       {Pass the -shell-escape flag to LaTeX. Refer to the minted.sty
220         documentation for more information.}\fi
221   \TestAppExists{pygmentize}
222   \ifAppExists\else
223     \PackageError{minted}
224       {You must have 'pygmentize' installed
225         to use this package}
226       {Refer to the installation instructions in the minted
227         documentation for more information.}
228   \fi}
229 %%%% Begin minted1 modification
230 \fi
231 %%%% End minted1 modification

```