

Writing, running and including the output of external documents from within a main L^AT_EX document –v. 0.23

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1 Syntax

```
\usepackage{hvextern}
```

This package allows to write external METAPOST, T_EX, ConT_EXt, L^AT_EX, LuaT_EX, LuaL^AT_EX, X_YT_EX, X_YL^AT_EX, Lua, Perl, Java and/or Python source code, which will then be run via shell escape to create a PDF oder text output to include it into the main L^AT_EX document.

There is only one environment and one command:

```
\begin{externalDocument}[<options>]{<external filename without extension>}
...
source code
...
\end{externalDocument}

\runExtCmd[<options>]{<command with arguments>}{<external filename without extension>}
```

The main document *must* be run with the `--shell-escape` option, otherwise it won't work, e.g.:

```
lualatex --shell-escape <file>
```

The purpose for this package is to show the output of documents which have to be compiled with a different preamble or a different engine or a complete different system, but integrating the output automatically in the main document..

All examples in this document are created on-the-fly while running this L^AT_EX document with lualatex with the `--shell-escape` option.

2 First examples

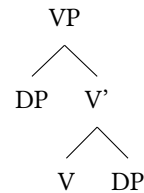
2.1 Without showing the code

This document was run with LuaL^AT_EX. Suppose you want to insert the output of a document which needs for several reasons a pdfL^AT_EX run. Instead of created and running a document outside of the main document and then to insert the output we can do this from within this LuaL^AT_EX document itself. The external document is compiled with pdfL^AT_EX and the output is insert as pdf image. The source code itself is not shown by the environment externalDocument.

```

\begin{externalDocument}[
  compiler=pdflatex,force,cleanup]{voss}
\documentclass{standalone}
%StartVisiblePreamble
\usepackage{fontenc}
\usepackage{libertinus}
\usepackage[linguistics]{forest}
\forestapplylibrarydefaults{linguistics,
  edges}
%StopVisiblePreamble
\begin{document}
\begin{forest}
[VP
  [DP
    [V
      [V
        [DP
        ]
      ]
    ]
  ]
]
\end{forest}
\end{document}
\end{externalDocument}

```



voss-1

2.2 Showing code and output of a Python example

The png image is created on the fly with the following arguments of externalDocument:

```

\begin{externalDocument}[
  compiler=python3,
  showFilename,
  code,
  ext=py,
  docType=py,
  usefancyvrb,
  grfOptions={width=\linewidth}]{python}
... Python code ...
\end{externalDocument}

```

The code which is declared as header and main can be marked by:

```

\hv@extern@exampleType{py}
{\NumChar StartVisibleMain}
{\NumChar StopVisibleMain}
{\NumChar StartVisiblePreamble}
{\NumChar StopVisiblePreamble}

```

\NumChar is the default Python comment character # and needs to be saved with a different category, which is done internally by the package. The complete definition of the code is:

```

\begin{externalDocument}[
  compiler=python3,
  showFilename,

```

```

code,
ext=py,
force=false,
docType=py,
usefancyvrb,
grfOptions={width=\linewidth}}{python}
import os
#StartVisiblePreamble
from PIL import Image
import subprocess
# drawing area (xa < xb and ya < yb)
xa = -0.1716
xb = -0.1433
ya = 1.022
yb = 1.044
maxIt = 1024 # iterations
imgx = 1000 # image size
imgy = 750
image = Image.new("RGB", (imgx, imgy))
#StopVisiblePreamble

#StartVisibleMain
for y in range(imgy):
    cy = y * (yb - ya) / (imgy - 1) + ya
    for x in range(imgx):
        cx = x * (xb - xa) / (imgx - 1) + xa
        c = complex(cx, cy)
        z = 0
        for i in range(maxIt):
            if abs(z) > 2.0: break
            z = z * z + c
        r = i % 4 * 6
        g = i % 8 * 32
        b = i % 16 * 16
        image.putpixel((x, y), b * 65536 + g * 256 + r)
#StopVisibleMain
# now get the filename created by the latex document
imageName = os.path.basename(os.path.splitext(__file__)[0])+".png" # get filename
image.save(imageName, "PNG")
\end{externalDocument}

```

And with using this code we get the image as png inserted. The given filename of the external document is internally extended by a consecutive number which isn't known to the Python code. However, it is no problem in any programming language to get the name of a running file. The forlast line in the above code shows how it can be done with Python.

```

from PIL import Image
import subprocess
# drawing area (xa < xb and ya < yb)
xa = -0.1716

```

```

xb = -0.1433
ya = 1.022
yb = 1.044
maxIt = 1024 # iterations
imgx = 1000 # image size
imgy = 750
image = Image.new("RGB", (imgx, imgy))

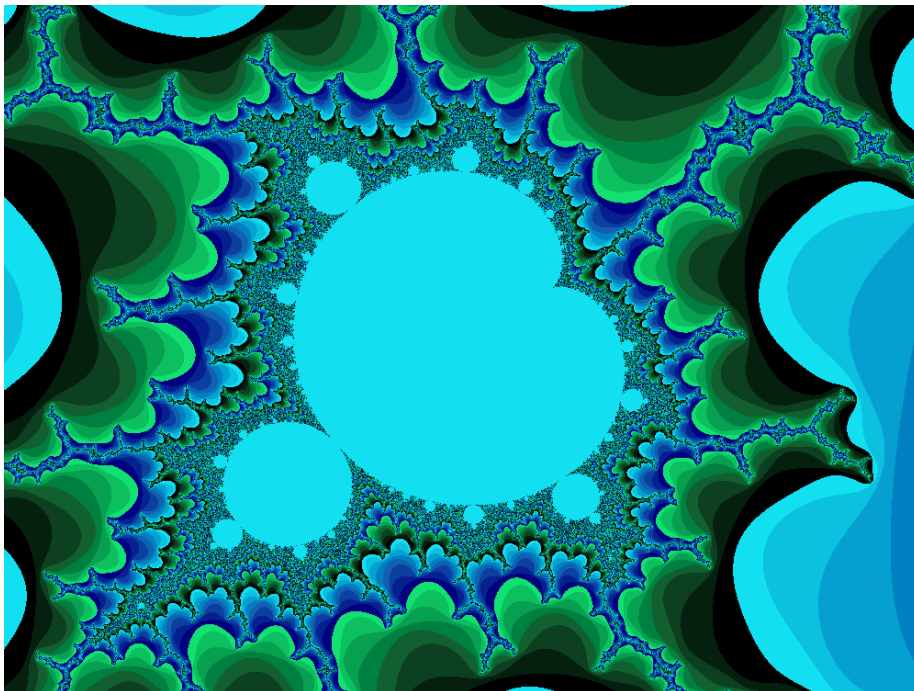
```

```

for y in range(imgy):
    cy = y * (yb - ya) / (imgy - 1) + ya
    for x in range(imgx):
        cx = x * (xb - xa) / (imgx - 1) + xa
        c = complex(cx, cy)
        z = 0
        for i in range(maxIt):
            if abs(z) > 2.0: break
            z = z * z + c
        r = i % 4 * 6
        g = i % 8 * 32
        b = i % 16 * 16
        image.putpixel((x, y), b * 65536 + g * 256 + r)

```

python-2.py

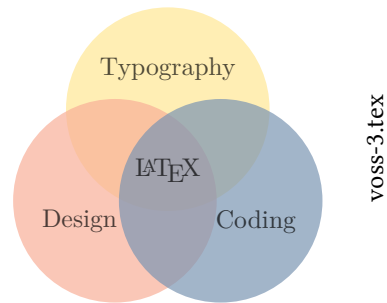


```

\usepackage{tikz}
\usepackage[hks,pantone,xcolor]{xspotcolor}

\SetPageColorSpace{HKS}
\definecolor{HYellow}{spotcolor}{HKS05N,0.5}
\definecolor{HRed}{spotcolor}{HKS14N,0.5}
\definecolor{HBlue}{spotcolor}{HKS38N,0.5}
\begin{tikzpicture}[scale=0.7,fill opacity
=0.7]
  \fill[HYellow]( 90:1.2) circle (2);
  \fill[HRed] (210:1.2) circle (2);
  \fill[HBlue] (330:1.2) circle (2);
  \node at ( 90:2) {Typography};
  \node at ( 210:2) {Design};
  \node at ( 330:2) {Coding};
  \node {\LaTeX};
\end{tikzpicture}

```



3 Setting marker in the source

The marker for the code ranges which should be listed depend to the used programming language:

```

[... ]
%StartVisiblePreamble
[... listed preamble code ]
%StopVisiblePreamble
[... ]
\begin{document}
[... ]
\end{document}

```

everything between %StartVisiblePreamble and %StopVisiblePreamble will be listed as preamble and in case of a \LaTeX source everything between `\begin{document}` and `\end{document}` as body. The marker must be defined with an own macro, e.g.:

```

\hv@extern@exampleType{py}
{ \NumChar StartVisibleMain}
{ \NumChar StopVisibleMain}
{ \NumChar StartVisiblePreamble}
{ \NumChar StopVisiblePreamble}

```

`\NumChar` is the comment character #, which needs a special handling. This version of `hvxextern` supports the following programming languages (option `compiler`): `mpost`, `tex`, `latex`, `luatex`, `python3`, `perl`, `lua`, `xetex`, `pdflatex`, `lualatex`, `xelatex`, and `context`. The default is `pdflatex`. The option `docType` selects the config file, which must be one of `context`, `lua`, `pl`, `tex`, `latex`, `mp`, and `py`. For Lua it is

```

\hv@extern@exampleType{lua}
{--StartVisibleMain}

```

```

{--StopVisibleMain}
{--StartVisiblePreamble}
{--StopVisiblePreamble}

```

It defines the marker strings for the listed code sequences. In some cases you have to use multiple times the same value for different optional arguments, e.g.

```
ext=lua, compiler=lua, docType=lua, ...
```

4 Optional arguments

The default setting is always shown in brackets.

4.1 Programs and runs

The proppath should only in some rare cases needed. In general all used compilers will be found by the system. A given proppath must be end with a slash, e.g. ./bin/

```

\define@key{hv}{proppath}[]{\def\hv@extern@proppath{#1}}
\define@key{hv}{compiler}[pdflatex]{\def\hv@extern@compiler{#1}}
\define@key{hv}{runsequence}[]{\def\hv@extern@runsequence{#1}}
\define@key{hv}{runs}[1]{\setcounter{hv@extern@runs}{#1}}

```

Instead of the optional arguments compiler, biber, and xindex one can define an individual command sequence by using the optional argument runsequence. It must be comma separated list:

```
runsequence={lualatex,biber,xindex -l de -c AU,lualatex,lualatex}
```

```

\usepackage[ngerman]{babel}
\usepackage{libertinus,hvindex}
\usepackage{makeidx}\makeindex
\usepackage{biblatex}\addbibresource{biblatex-examples.bib}

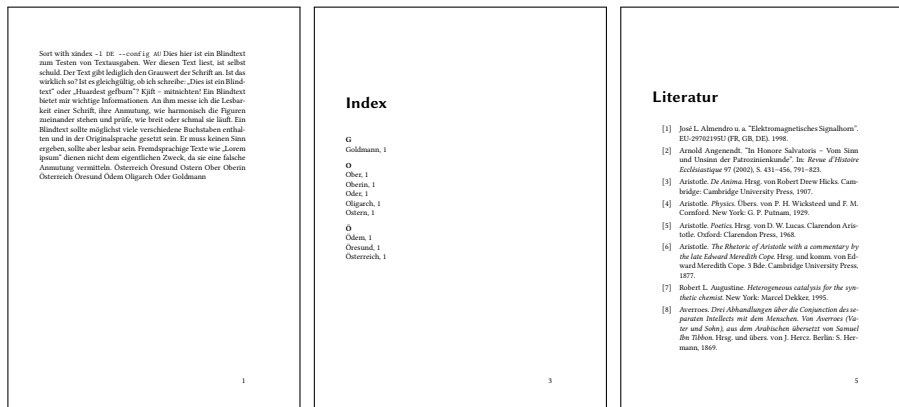
```

```

Sort with xindex \verb|-l DE --config AU|
\blindtext
\Index{Österreich} \Index{Öresund}
\Index{Ostern} \Index{Ober} \Index{Oberin}
\Index{Österreich} \Index{Öresund}
\Index{Ödem} \Index{Oligarch} \Index{Oder}
\Index{Goldmann}
\printindex
\nocite{*}\printbibliography
\blindtext
\blinddocument

```

voss-4.tex



The following Java-program creates the Mandelbrot set as png image. The valid setting for the environment externalDocument is:

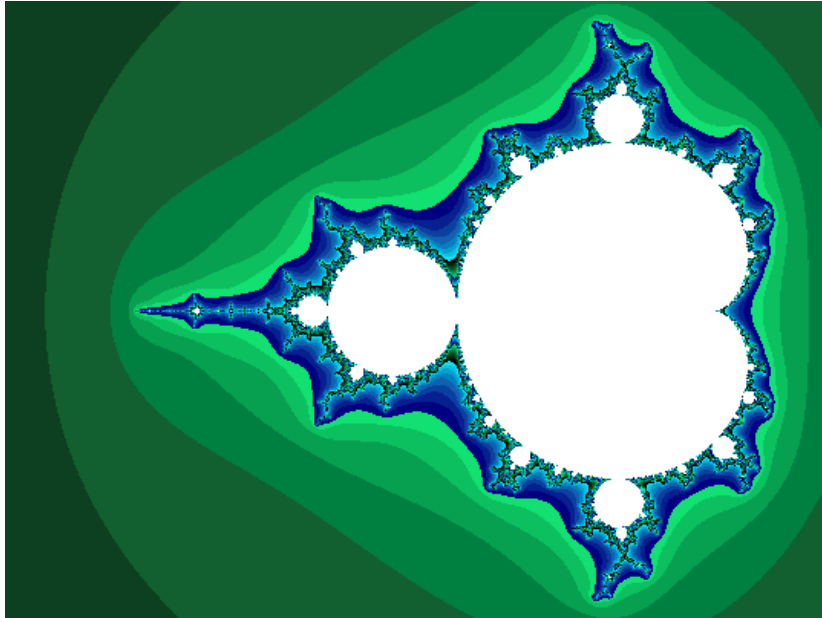
compiler=java,ext=java,docType=java,

```
public static int iterZahl(final double cx, final double cy, int maxIt,
    final double radius) {
    // bestimmt Anzahl der Iterationen
    int zaehler = 0;
    double zx = 0.0, zy = 0.0, tmp;
    do {
        tmp = zx*zx - zy*zy + cx;
        zy = 2*zx*zy + cy; zx = tmp;
        zaehler++;
    } while (zx*zx + zy*zy <= radius && zaehler < maxIt);
    return zaehler;
}
```

```
double xa = -2.5, xe = 0.7, ya = -1.2, ye = 1.2; // Ratio 20:15
double dx = (xe-xa)/(imageBreite-1), dy = (ye-ya)/(imageHoehe-1);
double cx, cy; int R, G, B;
double radius = 10.0; int maxIt = 1024;
cx = xa;
for (int sp = 0; sp < imageBreite; sp++) {
    cy = ye; // von oben nach unten
    for (int ze = 0; ze < imageHoehe; ze++) {
        int zIter = iterZahl(cx, cy, maxIt, radius);
        if (zIter == maxIt) {
            g.setColor(Color.WHITE);
            g.drawLine(sp, ze, sp, ze);
        } else {
            R = zIter % 4 * 6; G = zIter % 8 * 32; B = zIter % 16 * 16;
            g.setColor(new Color(R,G,B));
            g.drawLine(sp, ze, sp, ze);
        }
        cy = cy - dy;
    } // for ze
    cx = cx + dx;
```

java-5.java

```
} // for sp
```



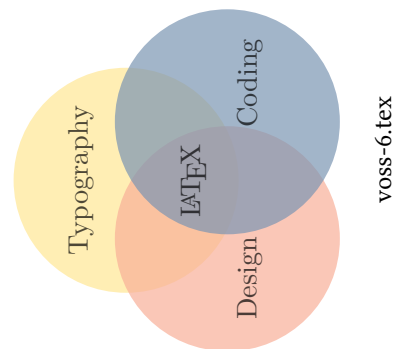
4.2 Grafik options

```
\define@key{hv}{grfOptions}[]{\def\hv@extern@grfOptions{#1}}
```

The option is passed to `\includegraphics`, e.g. `angle=90,width=\linewidth` for the following example.

```
\usepackage{tikz}
\usepackage[hks,pantone,xcolor]{xspotcolor}

\SetPageColorSpace{HKS}
\definecolor{HYellow}{spotcolor}{HKS05N,0.5}
\definecolor{HRed}{spotcolor}{HKS14N,0.5}
\definecolor{HBlue}{spotcolor}{HKS38N,0.5}
\begin{tikzpicture}[scale=0.7,fill opacity=0.7]
  \fill[HYellow] (90:1.2) circle (2);
  \fill[HRed] (210:1.2) circle (2);
  \fill[HBlue] (330:1.2) circle (2);
  \node at (90:2) {Typography};
  \node at (210:2) {Design};
  \node at (330:2) {Coding};
  \node {\LaTeX};
\end{tikzpicture}
```



4.3 Listings options

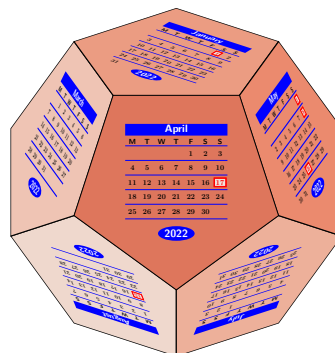
```
\define@key{hv}{lstOptions}[]{\def\hv@extern@lstOptions{#1}}
```

The option is passed either to `\lstinputlisting`, or, if `usefancyvrb` is active, to `\VerbatimInput`. The following example uses

```
lstOptions={basicstyle=\sffamily\itshape\scriptsize},
```

```
\usepackage{pst-calendar}

\psscalebox{0.3}{%
  \psCalDodecaeder[Year=2022,style=april]%
}
```



voss-7.tex

4.4 Background color

There are different colors for the preamble and body listing: the background and frame color.

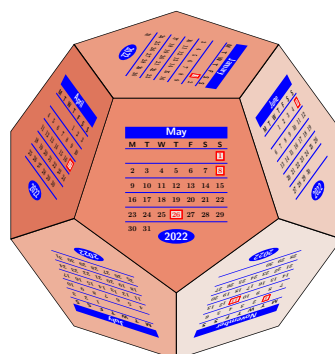
```
\define@key{hv}{BGpreamble}[black!12]{\def\hv@extern@BGpreamble{#1}}
\define@key{hv}{BGbody}[black!8]{\def\hv@extern@BGbody{#1}}
\define@key{hv}{BOpreamble}[black!12]{\def\hv@extern@BOpreamble{#1}}
\define@key{hv}{BObody}[black!8]{\def\hv@extern@BObody{#1}}
```

The options are passed to `tcolorbox` and preset to `black!12` and `black!8`. The color of the frame is set to the same values, hence not seen. The following example uses

```
BGpreamble=red!10, BOpreamble=red,
BGbody=blue!8, BObody=blue,
```

```
\usepackage{pst-calendar}

\psscalebox{0.3}{%
  \psCalDodecaeder[Year=2022,style=may]%
}
```



voss-8.tex

4.5 Type of the source code

The current version of `hvextern` supports code written as `METAPOST`, plain `TEX`, `LATEX`, `ConTEXt`, and `Python`. Every type has its own keywords for the linerange which should be printed for the preamble and the body. For example the `latex` config is:

```

\hv@extern@exampleType{latex}% for _all_LaTeX engines
{\string\begin\string{document\string}}%
{\string\end\string{document\string}}%
{\perCent StartVisiblePreamble}%
{\perCent StopVisiblePreamble}%

% only for the sequence latex->dvips->ps2pdf
\def\hv@extern@runLATEX#1#2#3#4{% path compiler file extension
\ifhv@extern@verbose \typeout{>>> running #1#2 #3#4}\fi
\ShellEscape{#1#2\space #3#4}%
\ifhv@extern@verbose \typeout{>>> running #1dvips #3}\fi
\ShellEscape{#1dvips\space #3.dvi}%
\ifhv@extern@verbose \typeout{>>> running ps2pdf #3.ps}\fi
\ShellEscape{#1ps2pdf\space -dAutoRotatePages=/None\space -dALLOWPSTRANSparency\space #3.ps}%
}

```

If a source needs more than running the defined compiler, it must be defined by a macro

```

\def\hv@extern@run<NAME>#1#2#3#4{% path compiler file extension
...}

```

The type of the source code can be different to the compiler, e.g. source latex, but compiler lualatex.

4.6 Output as floating object with caption and label

By default the images are not inserted as a float. This can be changed by the keyword float, a caption and a label are optional. The float type is always figure.

```

\define@boolkey{hv}[hv@extern@]{float}[true]{}
\define@key{hv}{caption}[]{\def\hv@extern@caption{#1}}
\define@key{hv}{label}[]{\def\hv@extern@label{#1}}

```

The image Figure 1 shows an example for a floating object.

```
\usepackage{pst-coxeterp}
```

```

\begin{pspicture}(-1,-1)(1,1)\Simplex[dimension=2]\end{pspicture}
%
\begin{pspicture}(-1,-1)(1,1)\Simplex[dimension=3]\end{pspicture}
%
\begin{pspicture}(-1,-1)(1,1)\Simplex[dimension=5]\end{pspicture}
%
\begin{pspicture}(-1,-1)(1,1)\Simplex[dimension=7]\end{pspicture}
%
% -----
% Only some text to show the pagebreak
% -----

```

voss-9.tex

4.7 Output more than one page

The pages which should be printed can be defined by

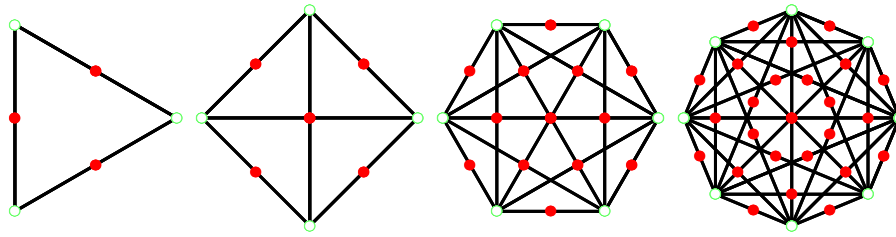


Abbildung 1: An example for Coxeter images

```
\define@key{hv}{pages}[1]{\def\hv@extern@pages{#1}}
\define@boolkey{hv}[hv@extern@]{frame}[true]{}

```

With frame the pages can be framed (internally by \fbox). It is leaved to the user to choose the correct image width for the pages. The following example uses:

```
pages={1,2,3},
grfOptions={width=0.3\linewidth},
compiler=lualatex, runs=2, % for the TOC
frame,

```

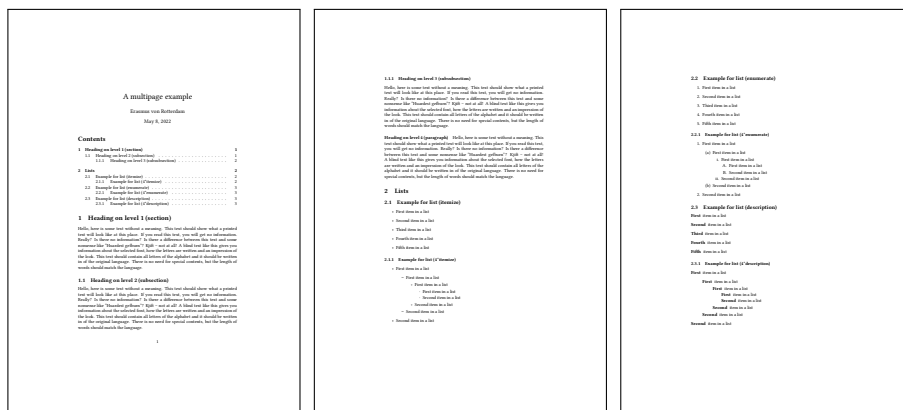
```
\usepackage[american]{babel}
\usepackage{libertinus}
\usepackage{blindtext}

```

```
\title{A multipage example}
\author{Erasmus von Rotterdam}
\maketitle
\tableofcontents
\blinddocument

```

voss-10.tex



4.8 Cropping the PDF

Instead of using the documentclass standalone, which already crops the created PDF, one can use the optional argument crop.

```
\define@boolkey{hv}[hv@extern@]{crop}[true]{}
\define@key{hv}{cropmargin}[2]{\def\hv@extern@cropmargin{#1}}% length in pt

```

voss-11.tex

```
\usepackage[american]{babel}
\usepackage{libertinus}
\usepackage{blindtext}
\pagestyle{headings}
```

A multipage example

Erasmus von Rotterdam

May 8, 2022

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2.1.3	Example for list (4 th item)	9
2.3	Example for list (description)	11
2.3.1	Example for list (4 th description)	12

1 Heading on level 1 (section)

Hells, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get an information. Really? It is not an information. There is a difference between this text and some someone like "Hundred people's" Right – not at all. A blind text like this gives you no information. It is not an information. There is no difference between this text and the look. This text should contain all letters of the alphabet and it should be written in the original language. There is no need for special contents, but the length of words should match the language.

This is the second paragraph. Hells, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get an information. Really? It is not an information? There is a difference between this text and some someone like "Hundred people's" Right – not at all. A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in the original language. There is no need for special contents, but the length of words should match the language.

This is the second paragraph follows the third paragraph. Hells, here is some text without a meaning. This text should show what a printed text will look like

1

[illegible]

By default the code and the output is on top of each other. With setting the width of a minipage with `mpwidth` greater than 0 pt the output will be side by side.

`mpwidth` is the width of the code. The rest of the line, minus 1em for the space between the minipages, will be the possible width for the output and will be calculated automatically. The two minipages are aligned by defaults to its top. This can be changed by setting `mpvalign` to `c` or `b`.

4.10 Horizontal alignment of the output

4.10.1 the default

`align=\centering,`

```
\rule{0.5\linewidth}{5mm}
```



voss-12.tex

4.10.2 Left aligned

`align=\raggedright,`

```
\rule{0.5\linewidth}{5mm}
```



voss-13.tex

4.10.3 Right aligned

`align=\raggedleft,`

```
\rule{0.5\linewidth}{5mm}
```



voss-14.tex

4.10.4 the default – side by side

`align=\centering, mpwidth=0.5\linewidth,`

```
\rule{0.25\linewidth}{5mm}
```



voss-15.tex

4.10.5 Left aligned – side by side

`align=\raggedright, mpwidth=0.5\linewidth,`

```
\rule{0.25\linewidth}{5mm}
```



voss-16.tex

4.10.6 Right aligned – side by side

`align=\raggedleft, mpwidth=0.5\linewidth,`

```
\rule{0.25\linewidth}{5mm}
```



voss-17.tex

4.11 Inline images

By default code and image are own paragraphs. With the optional argument `inline` the created image can be part of the current line. This may make sense, if you need characters which are not part of your current font.

```
\define@boolkey{hv}[hv@extern@]{inline}[true]{\hv@extern@codefalse}
```

With the setting `inline=true` the optional keyword `code` is automatically set to false. The next Chinese characters %美好的一天 are inserted as inline image without showing the code. The complete code looks like:

```
\begin{externalDocument}[
  compiler=xelatex, inline, runs=2, grfOptions={height=8pt},
  crop, cropmargin=0, cleanup, force=false, docType=latex]{voss}
\documentclass{ctexart}
\pagestyle{empty}
\begin{document}
  美好的一天
\end{document}
\end{externalDocument}
```

are inserted as inline image without showing the code. The complete code looks like:

4.12 Input text instead of an image

By default the created pdf which can be, of course, only text, will be inserted by `\includegraphics`. If you have only text as output and don't want to create a pdf you can insert this kind of output as verbatim text by setting `includegraphic=false`.

```
\define@boolkey{hv}[hv@extern@]{includegraphic}[true]{}
```

The textfile must have the same main filename with the extension `.txt`. As already mentioned, in every programming language you can get the current used filename from within the code itself. The following Perl example which calculates the Kaprekar constants uses

```
my $filename = $0;          # the current filename
$filename =~ s/\.pl//;      # without extension .pl
$filename = "${filename}.txt"; # for the output
```

Only for some completeness: a Kaprekar constant is a number A with $\max(A) - \min(A) = A$. \max and \min are the sorted digits of the number A : $495 = 954 - 459$.


```

my $zahl = 1;
my $anfang = 1;
my $ende = 9;

print $fh "Finding Kaprekarconstants ...\n";
while ($zahl < 8) {
    print $fh "${zahl}-stellig: ";
    foreach ($anfang...$ende) { # for every
        row $_
        @Zeichen = split(//,$_);
        $Min = join("",sort(@Zeichen));
        $Max = reverse($Min);
        $Dif=$Max-$Min;
        if($_ eq $Dif) {
            $found = 1;
            print $fh $_, " ";
        }
    }
    if (!$found) { print $fh "---\n"; }
    else { print $fh "\n"; }
    $found = false;
    $zahl = $zahl+1;
    $anfang = $anfang*10;
    $ende = $ende*10;
}

```

```

Finding Kaprekarconstants
...
1-stellig: ---
2-stellig:
3-stellig: 495,
4-stellig: 6174,
5-stellig:
6-stellig: 549945, 631764,
7-stellig:

```

voss-19.pl

Another example with running Lua to calculate and print the Pascal's triangle. The internal filename is available with

```

local filename = arg[0]
local shortFN = str:match("(.)%.?.+") -- delete extension
outFile = io.open(shortFN..".txt","w+") -- open external file

```

```

function nextrow(t)
    local ret = {}
    t[0], t[#t+1] = 0, 0
    for i = 1, #t do ret[i] = t[i-1] + t[i] end
    return ret
end

function triangle(n)
    t = {1}
    for i = 1, n do
        m = (n - i)
        for j = 1, m do outFile:write(" ") end
        for k = 1, i do outFile:write(string.format("%8s", t[k])) end
        outFile:write("\n")
        t = nextrow(t)
    end
end

```

```
triangle(10)
```

voss-20.lua

					1				
				1		1			
			1		2		1		
			1	3		3		1	
		1		4	6		4		1
		1	5	10		10		5	1
	1		6	15	20		15	6	1
	1	7	21	35		35	21	7	1
1		8	28	56	70		56	28	8
	1								
1	9	36	84	126	126	84	36		9
		1							

4.13 Running additional external programs

For a L^AT_EX additional programs for bibliography, index, a.s.o. maybe needed.

```
\define@boolkey{hv}[hv@extern@]{biber}[true]{}
\define@boolkey{hv}[hv@extern@]{xindex}[true]{}
\define@key{hv}{xindexOptions}[]{\def\hv@extern@xindexOptions{#1}}
\define@key{hv}{runsequence}[]{\def\hv@extern@runsequence{#1}}
```

The biber run needs no additional options, but for xindex it maybe useful. The following examples uses

```
\begin{externalDocument}[
  compiler=lualatex, runs=2, pages=2,crop,
  xindex, xindexOptions={-l DE --config AU},
  mpwidth=0.6\linewidth, usefancyvrb=false,
  docType=latex,
  ...
]{voss}
```

```
\usepackage{makeidx}\makeindex
\usepackage{hvindex}
```

```
Sort with xindex \verb|-l DE --config AU|
\Index{Österreich} \Index{Öresund}
\Index{Ostern} \Index{Ober} \Index{Oberin}
\Index{Österreich} \Index{Öresund}
\Index{Ödem} \Index{Oligarch} \Index{Oder}
\Index{Ostern} \Index{Ober} \Index{Oberin}
\Index{Obstler} \Index{Öl} \Index{ölen}
\Index{Oder|seealso{Fluss}} \Index{Göbel}
\Index{oder} \index{Fluss!Oder}
\Index{Goethe} \Index{Göthe} \Index{Götz}
\Index{Goldmann}
\printindex
```

Index

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Fluss	oder, 1
- Oder, 1	Oder, 1, <i>siehe auch</i> Fluss
	Oligarch, 1
G	Ostern, 1
Goethe, 1	
Goldmann, 1	Ö
Göbel, 1	Ödem, 1
Göthe, 1	Öl, 1
Götz, 1	Öresund, 1
	Österreich, 1
O	
Ober, 1	ö
Oberin, 1	ölen, 1

Instad of using the options compiler, biber, and xindex one can also use only the optional argument runsequence to define an individuell sequence of commands, e.g.:

```
runsequence={lualatex,biber,{xindex -l de -c AU},lualatex,lualatex}
```

```
Sort with xindex \verb|-l DE --config AU|
\blindtext
\Index{Österreich} \Index{Öresund}
\Index{Ostern} \Index{Ober} \Index{Oberin}
\Index{Österreich} \Index{Öresund}
\Index{Ödem} \Index{Oligarch} \Index{Oder}
\Index{Goldmann}
\printindex
\nocite{*}\printbibliography
\blindtext
\blinddocument
```

- [1] José L. Alendro y A. "Elektromagnetisches Signalhorn", *Zeitschrift für Naturwissenschaft* [PFR, G.R. Edn]. 1908.
- [2] Arnold Angenreim: "In Hämase-Salvatorei", in: *Annalen der Chemie und Pharmazie* 187 (1868), 1–12.
- [3] E. Kricheldorf: *Ergebnisse* 79 (2002), S. 431–456, 791–821.
- [4] Aristotle: *De Anima*. Hrsg. von Robert D. Hicks. Cambridge: Cambridge University Press, 1984.
- [5] Aristotle: *Metaphysik*. Übers. von K. Heidegger und F. Al. Cornford. New York: G. P. Putnam, 1929.
- [6] Aristotle: *Physics*. Hrsg. von W. D. Lucas. Clarendon Aristot.: Oxford, Cambridge University Press, 1968.
- [7] Aristotle: *Metaphysik*. Hrsg. von K. Heidegger und F. Al. Cornford by the late Edward Meredith Cope. Hrsg. und kommentiert by the late Edward Meredith Cope. Hrsg. und kommentiert by Edward Meredith Cope. 3 Bde. Cambridge: University Press, 1977.
- [8] Robert L. Augustine: *The homogeneous catalysis for the synthetic chemist*. New York: Marcel Dekker, 1995.
- [9] Averroës: Drei Abhandlungen über die Conjunction des Geistes mit dem Körper. Hrsg. von J. J. van Steenbrügge (Vater und Sohn) aus dem Arabischen übertr. von Samuel Majum Tilmon Hrsg. und übers. von J. Horst. Berlin: S. Fischer, 1967.

The default is using `\lstinputlisting` for the printed code sequences.

\RedeclareSectionCommand[

```

level=6,
toclevel=6,
tocindent=15em,
tocnumwidth=6.8em
]{subparagraph}
\setcounter{secnumdepth}{\subsubsubsectionnumdepth}
\setcounter{tocdepth}{\subsubsubsectionnumdepth}

```

```

\tableofcontents
\chapter{Einführung}
\section{Ein Abschnitt}
\subsection{Ein Unterabschnitt}
\subsubsection{Ein Unter-Unterabschnitt}
\subsubsubsection{Ein Unter-Unter-Unterabschnitt}
\paragraph{Der normale Paragraph}
\blindtext
\subparagraph{Der normale Unterparagraph}
\blindtext
\blindedocument

```

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Kapitel 1

Einführung

1.1 Ein Abschnitt

1.1.1 Ein Unterabschnitt

1.1.1.1 Ein Unter-Unterabschnitt

1.1.1.1.1 Ein Unter-Unter-Unterabschnitt

Der normale Paragraph. Dies hier ist ein Blindtext zum Testen von Textausgaben. Wer diesen Text liest, ist selbst schuld. Der Text gibt lediglich den Grauwert der Schrift an. Ist das wirklich so? Ist es gleichgültig, ob ich schreibe: „Dies ist ein Blindtext“ oder „Haardest gefahren?“ Kjñ – mñtschñ! Ein Blindtext bietet mir wichtige Informationen. An ihm messe ich die Lesbarkeit einer Schrift. Ihre Anmutung, wie harmonisch die Figuren zueinander stehen und prüfe, wie breit oder schmal sie läuft. Ein Blindtext sollte möglichst viele verschiedene Buchstaben enthalten und in der Originalsprache gesetzt sein. Er muss keinen Sinn ergeben, sollte aber lesbar sein. Fremdsprachige Texte wie „Lorem ipsum“ dienen nicht dem eigentlichen Zweck, da sie eine falsche Anmutung vermitteln.

Der normale Unterparagraph. Dies hier ist ein Blindtext zum Testen von Textausgaben. Wer diesen Text liest, ist selbst schuld. Der Text gibt lediglich den Grauwert der Schrift an. Ist das wirklich so? Ist es gleichgültig, ob ich schreibe: „Dies ist ein Blindtext“ oder „Haardest gefahren?“ Kjñ – mñtschñ! Ein Blindtext bietet mir wichtige Informationen. An ihm messe ich die Lesbarkeit einer Schrift. Ihre Anmutung, wie harmonisch die Figuren zueinander stehen und prüfe, wie breit oder schmal sie läuft. Ein Blindtext sollte möglichst viele verschiedene Buchstaben enthalten und in der Originalsprache gesetzt sein. Er muss keinen Sinn ergeben, sollte aber lesbar sein. Fremdsprachige Texte wie „Lorem ipsum“ dienen nicht dem eigentlichen Zweck, da sie eine falsche Anmutung vermitteln.

It also possible to use \VerbatimInput from package fancyvrb. In general it makes no difference using the optional argument usefancyvrb or not.

```

\documentclass[chapterprefix=on,parskip=half-,DIV=12,fontsize=12pt]{scrbook}
\DeclareNewSectionCommand[
style=section,
level=4,
beforeskip=-3.25ex plus -1ex minus -.2ex,
afterskip=1.5ex plus .2ex,
font=\normalsize,
indent=0pt,
counterwithin=subsubsection
]{subsubsubsection}
\RedeclareSectionCommand[

```

```
level=5,
toclevel=5,
tocindent=13em,
tocnumwidth=5.9em,
counterwithin=subsubsubsection
]{paragraph}
\RedeclareSectionCommand[
level=6,
toclevel=6,
tocindent=15em,
tocnumwidth=6.8em
]{subparagraph}
\setcounter{secnumdepth}{\subsubsubsectionnumdepth}
\setcounter{tocdepth}{\subsubsubsectionnumdepth}
```

```
\tableofcontents
\chapter{Einführung}
\section{Ein Abschnitt}
\subsection{Ein Unterabschnitt}
\subsubsection{Ein Unter-Unterabschnitt}
\subsubsubsection{Ein Unter-Unter-Unterabschnitt}
\paragraph{Der normale Paragraph}
\blindtext
\subparagraph{Der normale Unterparagraph}
\blindtext
\blinddocument
```

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1 Einführung

1.1 Ein Abschnitt

1.1.1 Ein Unterabschnitt

1.1.1.1 Ein Unter-Unterabschnitt

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2 Überschrift auf Ebene 0 (chapter)

2.1 Überschrift auf Ebene 1 (section)

2.1.1 Überschrift auf Ebene 2 (subsection)

2.1.1.1 Überschrift auf Ebene 3 (subsubsection)

2.2 Listen

2.2.1 Beispiel einer Liste (itemize)

2.2.1.1 Beispiel einer Liste ("Überrispe")

2.2.2 Beispiel einer Liste (enumerate)

2.2.2.1 Beispiel einer Liste ("Enumerate")

2.2.3 Beispiel einer Liste (description)

2.2.3.1 Beispiel einer Liste ("Description")

3

3

3

3

3

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1

Kapitel 1

Einführung

1.1 Ein Abschnitt

1.1.1 Ein Unterabschnitt

1.1.1.1 Ein Unter-Unterabschnitt

1.1.1.1.1 Ein Unter-Unter-Unterabschnitt

Der normale Paragraph

Der normale Unterparagraph

3

3

3

3

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8

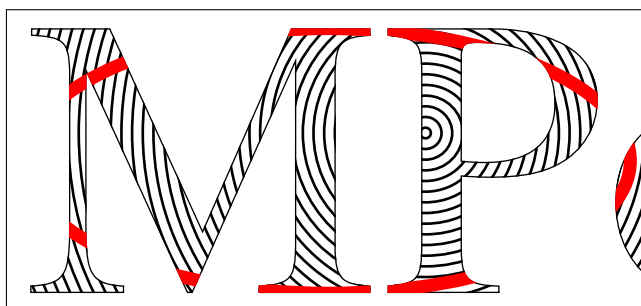
8

5 Supported engines

5.1 METAPost example

```
defaultfont:="ptmr8r";
warningcheck:=0;

draw fullcircle shifted (0.5,0.6) xscaled 8cm yscaled 3.5cm
  withpen pencircle scaled 5bp withcolor red;
special( " /Times-Roman findfont 150 scalefont setfont " &
  " 0 10 moveto (MPost) false charpath clip stroke gsave 150 70 translate "
  &
  " 2 4 600 {dup 0 moveto 0 exch 0 exch 0 360 arc stroke} for grestore ");
```



voss-25.mp

5.2 plainTeX example

```
\footline={\footsc the electronic journal of combinatorics
  {\footbf 16} (2009), \#R00\hfil\footrm\folio}

\font\bigrm=cmr12 at 14pt
\centerline{\bigrm An elementary proof of the reconstruction conjecture}

\bigskip\bigskip
\centerline{D. Remifa\footnote*{Thanks to the editors of this journal!}}
\smallskip
\centerline{Department of Inconsequential Studies}
\centerline{Solatido College, North Kentucky, USA}
\centerline{\tt remifa@dis.solatido.edu}
\bigskip
\centerline{\footrm
Submitted: Jan 1, 2009; Accepted: Jan 2, 2009; Published: Jan 3, 2009}
\centerline{\footrm Mathematics Subject Classifications: 05C88, 05C89}
\bigskip\bigskip
\centerline{\bf Abstract}
\smallskip
{\narrower\noindent
The reconstruction conjecture states that the multiset of unlabeled
vertex-deleted subgraphs of a graph determines the graph, provided it
has at least 3 vertices. A version of the problem was first stated
by Stanis\l aw Ulam. In this paper, we show that the conjecture can
be proved by elementary methods. It is only necessary to integrate
the Lenkle potential of the Broglington manifold over the quantum
supervacillatory measure in order to reduce the set of possible
```

voss-26.tex

counterexamples to a small number (less than a trillion). A simple computer program that implements Pipletti's classification theorem for torsion-free Aramaic groups with symplectic socles can then finish the remaining cases.}

`\bigskip`

`\beginsection 1. Introduction.`

This is the start of the introduction.

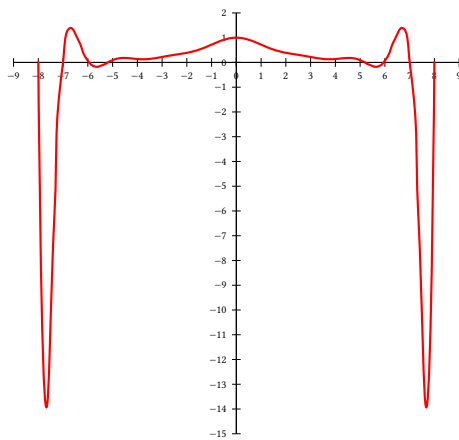


5.3 L^AT_EX example

```
\usepackage{fontenc}\usepackage{libertinus}
\usepackage{pst-all}
```

```
\psset{unit=0.8cm}
\begin{pspicture}(-9,-15)(9,2)
\psaxes(0,0)(-9,-15)(9,2)
\psplot[algebraic,plotstyle=curve,curvature=1 1 0,
linewidth=2pt,linecolor=red]{-8}{8}{
1 - 3876218985722260225*x^2/10892114744073986176
+ 14975974793271450625*x^4/174273835905183778816
- 317095420958296875*x^6/26811359370028273664
+ 194412970920703125*x^8/214490874960226189312
- 2090988251953125*x^10/53622718740056547328
+ 99480224609375*x^12/107245437480113094656
- 7879638671875*x^14/697095343620735115264
+ 152587890625*x^16/2788381374482940461056}
\end{pspicture}
```

voss-27.tex



5.4 ConT_EXt example

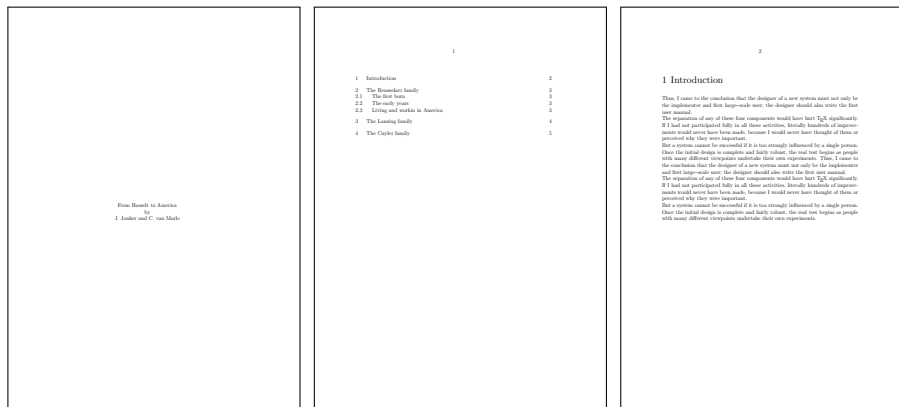
```

\definehead
[myhead]
[section]
\setuphead
[myhead]
[numberstyle=bold,
textstyle=bold,
before=\hairline\blank,
after=\nowhitespace\hairline]

\startstandardmakeup
\midaligned{From Hasselt to America}
\midaligned{by}
\midaligned{J. Jonker and C. van Marle}
\stopstandardmakeup
\placecombinedlist[content]
\chapter{Introduction}


```

voss-28.tex



6 Running external commands

Integrating the current directory of this document we can use the macro `\runExtCmd` with the optional argument `redirect`

```
\runExtCmd[redirect]{ls -la}{voss}
```

to get the directory listed:

```
total 4736
drwxr-xr-x  18 voss  staff   576  8 Mai 09:11 .
drwxr-xr-x 200 voss  staff  6400  8 Mai 09:07 ..
drwxr-xr-x   3 voss  staff   96 24 Apr 19:50 .ctan
drwxr-xr-x   4 voss  staff  128 27 Apr 11:29 .test
-rw-r--r--   1 voss  staff   379  8 Mai 09:09 Changes
drwxr-xr-x  90 voss  staff  2880  8 Mai 09:11 Examples
-rwxrwxrwx   1 voss  staff  1169  5 Mai 11:45 Makefile
-rw-rw-rw-   1 voss  staff   690 27 Apr 09:10 README
-rwxrwxrwx   1 voss  staff  3999  8 Mai 08:14 hvdoctools.sty
-rw-r--r--   1 voss  staff 20480  8 Mai 09:11 hvextern.aux
-rw-r--r--   1 voss  staff  4096  8 Mai 09:11 hvextern.idx
-rw-r--r--   1 voss  staff   600  8 Mai 09:05 hvextern.ilg
-rw-r--r--   1 voss  staff  6506  8 Mai 09:05 hvextern.ind
-rw-r--r--   1 voss  staff 160270  8 Mai 09:11 hvextern.log
-rw-r--r--@   1 voss  staff 1081586  8 Mai 09:11 hvextern.pdf
-rw-r--r--   1 voss  staff  21313  8 Mai 09:10 hvextern.sty
-rw-r--r--   1 voss  staff  43373  8 Mai 09:05 hvextern.tex
-rw-r--r--   1 voss  staff     0  8 Mai 09:11 hvextern.toc
```

7 Other options

force=false can speed up the comiling time for the document. If a created image/-output already exists, there is no need to create it with the next run again and again.

cleanup the auxiliary files of a \LaTeX -run are deleted, preset to aux, log. It must be a comma seperated list of the extensions of the main file, s.g. `cleanup={aux, log}`.

copyToExampleDir name of a directory for the examples, must first be created by the user himself

ExamplesDir move all examples into a directory

tclbox=false Can be used if there are some negative interactions between package listings and package tcolorbox.

eps create an eps from the pdf (historical).

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