

README

xint 1.2h

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Source: `xint.dtx` 1.2h 2016/11/20 (doc 2016/11/20)

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Info: Expandable operations on big integers, decimals, fractions

License: LPPL 1.3c

This README is also available as `README.pdf` and `README.html`.

Change log is to be found in `CHANGES.pdf` or `CHANGES.html`.

The user manual is `xint.pdf`, and the commented source code is available as `sourcexint.pdf`.

Aim

The basic aim is provide *expandable* computations on integers, fractions, and floating point numbers. For example

```
\xinttheexpr reduce(37189719/183618963+11390170/17310720)^17\relax
```

will evaluate exactly the fraction (the result has 462 characters including the fraction slash). One can also work with dummy variables:

```
\xinttheexpr mul(add(x(x+1)(x+2), x=y..y+15), y=171286,98762,9296)\relax
```

(evaluates to 15979066346135829902328007959448563667099190784.)

Float computations are possible at an adjustable precision (default 16).

```
\xintthefloatexpr 123456789^1000.5\relax
```

Mathematical functions (apart from `sqrt` which achieves correct rounding in arbitrary precision) are yet to be implemented.

It is possible to use the package with Plain as well as with LaTeX.

Sub-units `xintcore`, `xint` and `xintfrac` provide the underlying macros, and `xintexpr` loads all of them and provides expandable parsers allowing computations such as the above (and more). A more light-weight package `bnumexpr` (LaTeX only) loads only `xintcore` and provides a parser which handles only big integers, the four operations, the power operation and the factorial (1.2).

Usage

With LaTeX

```
\usepackage{xint}      % expandable arithmetic with big integers
\usepackage{xintfrac}  % decimal numbers, fractions, floats
\usepackage{xintexpr}  % expressions with infix operators
```

Further packages: `xintbinhex`, `xintgcd`, `xintseries` and `xintcfrac`. All dependencies are handled automatically. For example `xintexpr` automatically loads `xintfrac` which itself loads `xint`. Package `xintcore` is the subset of `xint` providing only the five operations on big integers: `\xintiiAdd`, `\xintiiMul`, ... There is also `xinttools` which is a separate package providing, among others, expandable and non-expandable loops such as `\xintFor`.

With TeX

One does for example:

```
\input xintexpr.sty
```

Again, all dependencies are handled automatically. The packages may be loaded in any catcode context such that letters, digits, `\` and `%` have their standard catcodes.

`xintcore.sty` and `xinttools.sty` both import `xintkernel.sty` which has the catcode handler and package identifier and defines a few utilities such as `\oodef`, `\fdef`, or `\xint_dothis/\xint_orthat`.

Installation

Method A: using the package manager of your TeX distribution

`xint` is included in [TeXLive](#) (hence also [MacTeX](#)) and [MikTeX](#).

There can be a few days of delay between apparition of a new version on [CTAN](#) and availability via the distribution package manager.

Method B: manual installation using `xint.tds.zip` and `unzip`

Assumes a GNU/Linux-like system (or Mac OS X).

1. obtain `xint.tds.zip` from CTAN: <http://mirror.ctan.org/install/macros/generic/xint.tds.zip>
2. cd to the download repertory and issue:

```
unzip xint.tds.zip -d <TEXMF>
```

where <TEXMF> is a suitable TDS-compliant destination repertory. For example, with TeXLive:

- Linux, standard access rights, hence sudo is needed, installation into the “local” tree:

```
sudo unzip xint.tds.zip -d /usr/local/texlive/texmf-local  
sudo texhash /usr/local/texlive/texmf-local
```
- Mac OS X, installation into user home folder (no sudo needed, and it is recommended to not have a ls-R file there, hence no texhash):

```
unzip xint.tds.zip -d ~/Library/texmf
```

Method C: manual installation using Makefile and xint.dtx

The Makefile automatizes rebuilding from xint.dtx all documentation files as well as xint.tds.zip. It is for GNU/Linux-like (inc. Mac OS X) systems, with a teTeX like installation such as TeXLive. Furthermore the [Pandoc](#) software is required.

1. obtain xint.dtx and Makefile from <http://mirror.ctan.org/macros/generic/xint>.
2. put them in an otherwise empty working repertory, run make or equivalently make help for further instructions.

Method D: installation starting with only xint.dtx

Run "tex xint.dtx" or "etex xint.dtx" to extract from xint.dtx all packages as well as these files:

README.md the current README with Markdown formatting.

CHANGES.md the changes across successive releases.

xint.tex used to generate xint.pdf via "latex xint.tex" (thrice) then "dvipdfmx xint.dvi". It is also possible to compile xint.tex with xelatex, or with pdflatex (this latter option produces a bigger pdf).

For successful compilation, packages newtxtt, newtxmath, etoc, mathastext are needed. Inclusion of the source code is off by default, but the toggle can be set in xint.tex.

A third option is to generate xint.pdf via xelatex xint.dtx or pdflatex xint.dtx. Source code is then included by default (but some code comments in French use 8bit characters, hence for xelatex an a priori conversion of xint.dtx into utf-8 will give a better result).

Makefile.mk this is for UNIX-like systems. Note: this file is only produced with "etex xint.dtx", not with "tex xint.dtx". Rename it to Makefile and run make on the command line for further help.

doHTMLs.sh and **doPDFs.sh** these are scripts (for UNIX-like systems) which can be used to convert the README.md and CHANGES.md to HTML and PDF formats. They require [Pandoc](#).

pandoctpl.latex a Pandoc template used by doPDFs.sh.

Finishing the installation in a TDS hierarchy:

- move the style files to TDS:tex/generic/xint/
- xint.dtx goes to TDS:source/generic/xint/
- the documentation (xint.pdf, README.md, . . .) goes to TDS:doc/generic/xint/

Depending on the destination, it may then be necessary to refresh a filename database.

License

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<http://www.latex-project.org/lppl/lppl-1-3c.txt>

and version 1.3 or later is part of all distributions of LaTeX version 2005/12/01 or later.

This Work has the LPPL maintenance status `author-maintained`.

The Author of this Work is Jean-Francois Burnol.

This Work consists of the source file `xint.dtx` and of its derived files: `xintkernel.sty`, `xintcore.sty`, `xint.sty`, `xintfrac.sty`, `xintexpr.sty`, `xintbinhex.sty`, `xintgcd.sty`, `xintseries.sty`, `xintcfrac.sty`, `xinttools.sty`, `xint.ins`, `xint.tex`, `README`, `README.md`, `README.html`, `README.pdf`, `CHANGES.md`, `CHANGES.html`, `CHANGES.pdf`, `pandoctpl.latex`, `doHTMLs.sh`, `doPDFs.sh`, `xint.dvi`, `xint.pdf`, `Makefile.mk`.