

latex-papersize

Calculate LaTeX paper and margin settings for arbitrary magnification

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Version 1.69.

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Introduction

When producing enlarged material in L^AT_EX for people with low vision, it’s often not enough to simply add such things as `\Large` because that doesn’t enlarge *everything* and it can be difficult to achieve the exact desired size, especially if unusual packages are being used as well.

It’s more effective to change the L^AT_EX paper size and margin settings to simulate *small paper* and then magnify the result up to the desired physical paper size. This magnifies everything, and also adds some clarity for low-vision users because fonts like CMR have different versions at different sizes and the small-sized versions are often meant to be clearer.

latex-papersize calculates the necessary settings for arbitrary font and page sizes. There are two ways to run it: a modern `.sty` that works in `pdflatex`, `xelatex` and `lualatex`, and a legacy Python script that works with `pdflatex` or plain old `latex / dvips`. The legacy Python script requires Python (works in both Python 2 and Python 3) but the `.sty` file can be used as-is.

Basic usage

In the following instructions, base-size is the point size that the TeX file is based on (if the documentclass specifies 12pt then `\small=11 normal=12 \large=14 \Large=17 \LARGE=20 \huge=25`), and desired-size is the point size that you want to produce.

For the modern `.sty` file, simply `\usepackage[basesize=12,desiredsize=26]{latex-papersize}`. Other parameters are the dimensions `paperwidth` and `paperheight` if not A4, `marginleft` and `margintop`, and `extrabottom` for how much space to leave for page numbers at the bottom of each page (if this is left at 0 by default, page style empty will be set).

If you need to use the legacy Python script instead, its command-line parameters depend on whether you are using `latex/dvips` or `pdflatex`. On most systems, you can begin by typing `python latex-papersize.py`. On some systems you will need to type `python3` instead of `python`, and/or you may need to specify the full path of `latex-papersize.py` depending on your distribution. If you've installed it using `pip`, you can try `python -m latex-papersize` or `python3 -m latex-papersize`. You may also be able to copy `latex-papersize.py` to a directory on your PATH such as `/usr/local/bin` and then just type `latex-papersize`.

The instructions below assume you will be typing `python latex-papersize.py` but you should change this to suit your system as described in the above paragraph.

For use with L^AT_EX and dvips

To print the geometry settings:

```
python latex-papersize.py base-size desired-size tex
e.g.: python latex-papersize.py 12 26 tex
```

The output of this command should then be placed after `\documentclass` in your `.tex` file.

Then run `latex` to make a DVI file, and then do:

```
python latex-papersize.py base-size desired-size dvi-file
e.g.: python latex-papersize.py 12 26 myfile.dvi
```

which will print the appropriate `dvips` command.

For use with pdflatex

With `pdflatex` you need only one command:

```
python latex-papersize.py base-size desired-size pdftex
```

the output of this command should go just before `\begin{document}`. NB if using `hyperref` package, put `hyperref` *after* these settings (and if also using `pinyin` package then put `pinyin` package after that again)

Page numbers

When invoking `latex-papersize.py` with the `tex` or `pdftex` options, you can optionally add a fourth parameter to specify how many points to leave for page numbers at the bottom of each page. Normally 15 is a good idea. Leaving this out causes no room to be left for page numbers and `\pagestyle{empty}` to be added. This does not affect the `dvips` command.

Paper sizes and margins

It is assumed that the final physical printout will be on A4 portrait with 10mm margins. You can override this by setting the `paper_width` and `paper_height` environment variables (in millimetres) before running, e.g.: `paper_width=297 paper_height=210 python latex-papersize.py ...` You can also set the environment variables `margin_left` and `margin_top` (the right and bottom margins are assumed to be mirrors of these).

If using with non-PDF latex, remember to set the environment variables again when asking `latex-papersize.py` for the `dvips` command. Or “export” them so they remain set.

Poster printing

If you want to print on a physical paper size that is larger than your printer can handle, you can make up the larger size by sticking together smaller pieces of paper. Perhaps the best way to do this is to use a separate utility that knows about printable areas, cut margins, etc, such as Jos van Eijndhoven’s `poster` utility at <https://ctan.org/pkg/poster> (last known upstream URL: <ftp://ftp.es.ele.tue.nl/pub/users/jos/poster/poster.tar.gz>)

In this case you can give `latex-papersize.py` a `margin_left` and `margin_top` of 0 (because `poster` will handle the margins), set the paper size and desired point size appropriate for the final poster, use `latex/dvips`, and run the resulting `.ps` through `poster` with `-s 1`. This is better than getting `poster` to scale, because if any of your fonts are rendered into bitmaps by Metafont (as some CJK fonts are) then you will likely get a better resolution if the final size is given to `latex-papersize.py` rather than to `poster`.

If you're aiming for a specific number of sheets of paper, don't pick a physical size that's an exact multiple of your printer's paper size, because `poster` accounts for unprintable areas and overlaps slightly. Multiply the printer paper's height and width by 0.88 (or 0.86 if you want a visual margin added to the finished poster besides the cutting margins) and try a multiple of that size.

Example usage in a script

To typeset a L^AT_EX file `file.tex` and magnify from 12-point to 26-point, type a line such as the following (after adjusting the documentclass it specifies, and removing or commenting out the documentclass in `file.tex`):

```
latex "\\documentclass[12pt]{article}$(python latex-papersize.py
12 26 tex)\\input{file.tex}" && mv article.dvi file.dvi
```

Or in `pdflatex` (slightly more complex because we need to put the settings just before `\begin{document}`): `cat file.tex | awk -- "/^ *\\\\\\begin *\\\\{document\\\\}[^#~]*\\$/ { print \"$(python latex-papersize.py 12 26 pdftex | sed -e 's/\\\\/\\\\\\\\/g')\" } { print }" > /tmp/tmp.tex` then `pdflatex "\\documentclass[12pt]{article}\\\\input{/tmp/tmp.tex}" && mv article.pdf file.pdf`

To run `dvips` on the `.dvi` file (not needed for `pdflatex`):

```
$(python latex-papersize.py 12 26 file.dvi)
```

It is now recommended to use the newer `.sty` file with a PDF backend instead of doing all this.