Font selection in LaTeX:
The most frequently asked questions

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Abstract

This article tries to answer the three most popular questions regarding font selection in LaTeX, primarily providing guidance through the existing documentation.

1 Basic commands

Having read any LaTeX introduction of your choice (for instance, [1]), you should be familiar with the basic commands for font selection. To start with, let's summarize them once again.

These declarations let you choose among three pre-defined font families:

\rmfamily	roman (i.e., serifed)
\sffamily	sans serif
\ttfamily	monospaced ("typewriter")

Within each font family, the following declarations select the "series" (i.e., darkness or stroke width),

\mdseries	regular
\bfseries	**bold**

and the "shape" (i.e., the form of the letters):

\upshape	upright
\slshape	*slanted*
\itshape	*italic*
\scshape	CAPS AND SMALL CAPS

These commands are "declarations", i.e., they remain in effect until the end of the current group or environment. For each declaration there exists a text-generating command as a counterpart; it typesets only its argument in the desired style; for instance, \textsf corresponds to \sffamily. See, e.g., [1], chapter 3.1 and appendix C.15.1.

Family, series and shape can be combined, e.g., \bfseries\itshape results in ***bold italic*** type. Notice, however, that not every possible combination is required to exist; for instance, many font families are lacking small caps.

This scheme is called NFSS (New Font Selection Scheme), and its official documentation [2] is available in every LaTeX system as a DVI or PDF document `fntguide.dvi` or `.pdf`.

2 How can I change the default fonts for the whole document?

Most likely, you will already recognize the three default font families used by LaTeX:

roman:	Computer Modern Roman
sans serif:	Computer Modern Sans Serif
monospaced:	Computer Modern Typewriter

Outside the world of TeX, these font families are far from popular, so the question asked in the title of the present section is perhaps the "top of the FAQs".

The families selected by \rmfamily, \sffamily and \ttfamily are determined by the corresponding macros \rmdefault, \sfdefault and \ttdefault. You can use the well-known \renewcommand to alter them—provided that you know the name of the desired font family. For instance, try adding:

\renewcommand{\rmdefault}{ptm}

to the preamble of a document. `ptm` is the name under which the font family "Times" is installed in your LaTeX system, so all (roman) text in your example document should change from CM Roman to Times. (Most likely, you will now ask the question how to learn the name of a font family: please, be patient, it will be answered in the next section.)

If, however, there is any piece of maths in your example, you will notice that changing \rmdefault does *not* affect formulas. In the above case, they will still be typeset using the CM math fonts, which do not blend well with Times.

Changing the math fonts requires more effort than simply redefining a few macros. That's why alternative math fonts are usually accompanied by a *macro package*: loading the package makes all changes needed to replace the default (CM) math fonts; in many cases these packages take care of redefining \rmdefault appropriately, too. For instance, to change both text and formulas to Times, you would in fact add the following line to your document preamble, rather than the one given above:

\usepackage{mathptmx}

There are also macro packages that change only one of the text fonts, but provide additional features such as scaling.

This raises a few questions: You need to know *which* alternative fonts besides Computer Modern are available in your LaTeX system at all, you need to know the "LaTeX names" of the font families you want to use, and you need to know if there are any related macro packages available. These issues lead us to the next section:

3 Which font families are available in my LaTeX system?

There is a minimum set of alternative fonts that must *always* be available besides Computer Mod-

ern; the related collection of macro packages is often referred to as the "PSNFSS collection". In particular, it supports the popular typefaces Times, Helvetica, Palatino and Charter (and a few others), and it supports math fonts that suit Times and Palatino. The related documentation [3] is available in every LaTeX distribution as a PDF file named `psnfss2e.pdf`, usually in the directory `doc/latex/psnfss`. Reading this document is *strongly* recommended. It tells the 'family names' of the supported fonts (such as `ptm` above), and explains the usage of the related macro packages. (See [3], tables 1 and 3.)

Everything that goes beyond the PSNFSS collection is, strictly speaking, optional; i.e., only the documentation of your particular TeX distribution can tell you which fonts are shipped with the system, and where the related documentation is installed.

Most contemporary TeX distributions provide (almost) all free text and math fonts that are available from CTAN; a good overview of the most popular ones is given in chapter 7 of the *LaTeX Companion* [4].

Further font families that have been made available for use with LaTeX are summarized in [5].

4 How can I change the fonts to be used for certain parts of the document?

A popular request is to customize the style of certain elements of the document; for example, the font used in section headings and/or captions. The style of these elements, including the font choice, is determined by the document class you are using. Unfortunately, the standard classes (article, report, book) do not by default provide any means for this kind of customization.

One solution is to use extra packages that add the required functionality; the most popular ones are the packages `titlesec` [6] and `sectsty` [7] to change the style of the section headings, and `caption` [8] to control the style of the captions of figures and tables. Use of these packages is described in detail in the related documentation.

Newer, alternative document classes often go a different way. The KOMA-script classes [9] as well as the Memoir class [10] provide various means for customization. As an example, let's take a look at the interface of the KOMA classes to control the style of section headings:

By default, the KOMA classes use the bold series of the sans-serif font family to typeset headings. To change this, the command

```
\setkomafont{sectioning}{...}
```

is provided. Its second argument is to contain all declarations to be applied when the section headings are typeset. A frequent requirement is to use the bold series of the roman font family instead (as in the standard classes), and additionally to apply `\boldmath`, so that mathematical elements in section headings are emboldened, too. Doing this is straightforward with the KOMA classes:

```
\setkomafont{sectioning}
        {\rmfamily\bfseries\boldmath}
```

Analogously, the style of captions can be controlled via the command `\setkomafont{caption}{...}`.

Typically, with these extra packages and classes it becomes a matter of a single line of LaTeX commands to change the formatting of many parts of the document.

5 Conclusion

At first sight, font selection in LaTeX looks like a relatively complex issue, because it differs fundamentally from font handling in "classical" DTP programs. Yet, it isn't hard when you look in the documentation, and in this article we have tried to show some concise pointers.

References

[1] Leslie Lamport: *LaTeX: A Document Preparation System*, 2nd edition. Addison Wesley, 1994.

[2] LaTeX3 Project Team (Ed.): LaTeX 2_ε font selection. Part of the LaTeX online documentation, file `fntguide.pdf`

[3] Walter Schmidt: Using common Postscript fonts with LaTeX. Part of the LaTeX online documentation, file `psnfss2e.pdf`

[4] Frank Mittelbach et al.: *The LaTeX Companion*, 2nd edition. Addison Wesley, 2004.

[5] TeX Users Group: Fonts and TeX. http://tug.org/fonts

[6] Javier Bezos: The titlesec and titletoc packages. http://ctan.org/tex-archive/macros/latex/contrib/titlesec/

[7] Rowland McDonnell: The sectsty package. http://ctan.org/tex-archive/macros/latex/contrib/sectsty/

[8] Axel Sommerfeldt: The caption package. http://ctan.org/tex-archive/macros/latex/contrib/caption/

[9] Markus Kohm: The KOMA-script bundle. http://ctan.org/tex-archive/macros/latex/contrib/koma-script/

[10] Peter Wilson: The Memoir class. http://ctan.org/tex-archive/macros/latex/contrib/memoir/