Installing LaTeX for Windows

Peter Hertel

University of Osnabrück, Germany

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Abstract

This is an educational article addressing students of the Applied Physics School at TEDA, Tianjin, PR of China. LaTeX is <u>the</u> choice for scientific articles, or papers, in physics and mathematics. Whenever mathematical formulas are to be composed, everything else is, mildly speaking, suboptimal. We describe here how to install LaTeX as well as a graphical user interface (GUI) for it. In only one step, a LaTeX source is transformed into a PDF file which is fit for display on practically any viewing device and for printing on nearly all printers.

1 Preliminaries

The core of modern scientific text processing is the TeX program. It has been programmed by one of the most renowned computer scientists, Donald Knuth[1], of Stanford university. He wanted to save the age-old art of typesetting into the computer age and made friends with a retired German professor who told him all about typesetting.

He took a leave of one year, but it lasted seven years until a typesetting program was ready for release into the public domain, namely TeX [1]. Pure TeX is considered to be rather complicated. It had to be adapted to the casual user by using its macro facility. You easily can define new commands in terms of already known commands.

Lesli Lamport, then with the Digital Equipment Corporation, designed La-TeX [2], *a document preparation system*. TeX was complicated, but LaTeX is for everyone. It screens you from TeX details and introduces a small set of commands that can easily be remembered.

We therefore install the TeX engine together with the LaTeX set of macros which have been compiled into the program.

However, this is not yet enough. There are helper programs for including pictures, for representing computer source code, for the adaption to other languages than English, and so forth. And there are many fonts between which you may choose. Therefore, you will install not just the LaTeX program, but an

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[1]Incidentally, he has studied physics.

entire bundle of packages. We recommend the MiKTEX distribution because it addresses Windows only. There are many versions, but the basic version will be more than sufficient. If it should turn out that you need additional packages, they will be installed automatically via the Internet.

2   Installing MiKTEX

Go to `http://miktex.org/`. Click on *Download* and select the current version. Click on it. Locate the *Basic MikTex 2.8 Installer*[2]. Before clicking *Download* you may select the server. Normally a server close to your location (according to the IP address) is suggested, accept it. Then download `basic-miktex.exe` and execute it.

You will be asked for the preferred paper size (A4) and what to do if a package is missing. I have selected *ask me first*.

Once you have installed MiKTEX, you should localize the update wizard and run it. Although LATEX itself does not change any more, its helpers still contain bugs which are removed.

3   Graphical User Interface

There are many graphical user interfaces (GUI) for LaTeX, and I have tried them all.

Up to last year I have used WinEdt which is shareware. You may use it for a while, but then you must pay for it. WinEdt is nearly perfect, but it has two weak points:

- It does not understand Unicode which is the emerging standard for character encoding.

- It previews `.pdf` files[3] with the Acrobat viewer program by Adobe. If they release a new version, WinEdt may not work properly any more.

I now use TexMaker. It is available for Windows, Unix, and McIntosh, is based on Unicode, has its own PDF previewer, uses public domain dictionaries for spell checking, and it allows for jumping between a position in the source code to its PDF counterpart, and vice-versa. It also comes with a rather complete LaTeX help.

4   How to use it

Start the TexMaker program. Select `New` from the `File` menu, or click on the new file icon in the task bar. A new empty document is opened. Now type[4]

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[2]as of today, September 2009

[3]*Portable Document Format*

[4]The line numbers must <u>not</u> be typed

```
1   % this file is test.tex
2   \documentclass{article}
3   \begin{document}
4   Hello, world!
5   \end{document}
```

Save this file as `test.tex`. Select `PDFLaTeX` as the text processor and click on the start icon (right blue arrow) in the task bar. This will translate the source code to `test.pdf`. If all went well the message log will display `Process exited normally`. You may now view the result. The rest is simple, as we shall show in another article. You will later see that you have to compile your source more than once until everything is all right.

The `Options` button lets you change preferences. Make `pdfLaTeX` the default and adjust the editor font size. The `Help` button brings you to the TexMaker manual and the LaTeX help.

Dictionaries for British English, German, French, Italian and Dutch are already installed. I have replaced the `en-GB` dictionary by `en-USA`. These dictionaries are also used by OpenOffice, they are free.

References

[1] Donald Knuth, *The TeXbook*, Addison-Wesley, 1984. ISBN 0-201-13448-9

[2] Leslie Lamport, *LaTeX: A document preparation system: User's guide and reference*, Addison-Wesley, 1994. ISBN 0-201-52983-1.