What is TEX?

When someone asks you, "What is that word processor you are using?", have you ever wished you had a one page description to hand them? Here is one such brief introduction.

Technically speaking, TEX is a computer application for laying out ("typesetting") pages of text based on the text the user has written and other instructions the user has given. In other words, like the ubiquitous Word, TEX decides where to split lines of text, where to start a new page, and so on.

TEX was created by the noted computer scientist and innovator in computer-based typesetting, Donald Knuth, who developed it over many years and made it freely available to the world. Knuth provided for and invited *users to enhance TEX*, and it has in fact been extended to many types of documents (letters, articles, books, slide shows, concert posters, etc.) and many domains (chemistry, chess, music, poetry, linguistics, critical editions, etc.). The most popular enhancement to TEX is called LATEX, which supports most needs in a straightforward manner.

TEX is always used in conjunction with a text editor that lets you move around in your document adding new text, revising text, and adding instructions for how you want the text formatted. Unlike Word, TEX is available from a variety of commercial, shareware or free sources, configured in ways that different users find suitable (`www.tug.org/begin.html`). But, at their core, all of these have the same TEX "typesetter" from Knuth, and most documents can be moved from one TEX implementation to another without trouble.

Another way that TEX is different than Word and many other word processors is that all typesetting instructions are explicitly typed into and shown in the document file. Here is a short, but perhaps instructive, example LATEX file:

```
\documentclass{article}
\usepackage{a4}
\usepackage{times}
\begin{document}
This is a small example of a
two paragraph document.

This is the \emph{second} paragraph.
\end{document}
```

And here is the formatted output (plus a page number, not shown):

This is a small example of a two paragraph document.
This is the *second* paragraph.

Some points to note: Where Word uses an extra strike of the Enter key to indicate a new paragraph and this information is hidden after the last character of the paragraph (or with the ¶ sign), LATEX uses a visible blank line to indicate a paragraph break (see the example). In Word you can select the style of document, paper size, and font with various menu commands; in LATEX you type these instructions into your file as shown in the first lines of the example (A4 paper, Times fonts). In Word you might type control-I to turn on italics, then type a word, and then type control-I again to turn off italics; in LATEX you indicate *emphasis* explicitly (with `\emph`), as shown in the example's second paragraph.

Our purpose here is to explain what TEX is — not to compare the power of TEX with the power of other types of word processors. Suffice it to say that many people find TEX and its companions useful in a wide variety of applications.

Because TEX from any source has the same extendable basic capability and because the capability for enhancement is very explicit, users are motivated to enhance TEX and there is tremendous sharing of enhancements among TEX users. The Comprehensive TEX Archive Network (CTAN) is a massive collection of TEX enhancements for various application domains, document types, and typesetting flourishes. Discussion groups, for example, `comp.text.tex` and `texhax@tug.org`, provide forums where users can seek help from other (some very expert) users. The TEX Users Group (TUG) and other national user groups provide resources such as user conventions and journals (like this one).

If you aren't already using TEX, you might try proTEXt for Windows (`www.tug.org/protext`), TEX Live for Unix (`www.tug.org/tex-live`), or gwTEX for Mac OS X (`www.rna.nl/tex.html`). When asked how much to install, it's simplest to select *all* packages.

After getting a system installed, a first test is to run `pdflatex sample2e` and view the resulting `sample2e.pdf`. Then start reading documentation, either online in "Not So Short Introduction to LATEX" (`www.tug.org/tex-archive/info/lshort/`) or in print in Kopka & Daly's *Guide to LATEX* (`www.tug.org/books/`). Reading the `sample2e.tex` source file itself can also help in beginning to understand LATEX. If you need help with a specific problem, check the TEX FAQ (`www.tex.ac.uk/faq`). There are *many* other resources available; the sites listed here are a starting point for exploration.

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