The Tex Language

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1 Introduction

1.1 What is TeX?

TeX is a typesettimg software (and language) written in 1978 by Donald Knuth.

TeX defines all the primitive commands to produce high quality books (especially mathematical formulae). The original output file format is the `.dvi` (Device independent file format).

1.2 What is LaTeX?

LaTeX is a logical extension of TeX language adding lots of general purpose macros to it.

A macro is a new command containing primitive commands and/or other macros.

1.3 TeX Engines

TeX engines are the executable binaries which implement different TeX variants.

The most common ones are:

e-TeX	• Additional primitive commands to TeX
pdfTeX	• Incorporates the e-TeX extension • Direct access to PDF-specific features
XeTeX	• Incorporates the e-TeX extension • Works with native UTF-8 • Can access system fonts • Sophisticated handling of multilingual typesetting
LuaTeX	• Incorporates the e-TeX extension • Works with native UTF-8 • Lua scripting language • extensibility through C/C++ plugins
pTeX **upTeX**	• Variants of TeX written for (primarily) Japanese typesetting
csLaTeX **pdfcsLaTeX**	• Czech and Slovak TeX support

1.3.1 LaTeX versions

We can also talk about the LaTeX versions of some of these programs, for instance

- **pdfLaTeX** means using the LaTeX macro package with the pdfTeX engine.
- **XeLaTeX** means using the LaTeX macro package with the XeTeX engine.
- **LuaLaTeX** means using the LaTeX macro package with the LuaTeX engine.
- **pLaTeX** means using the LaTeX macro package with the pTeX engine.
- **upLaTeX** means using the LaTeX macro package with the upTeX engine.

1.4 Distributions

MiKTeX, TeXLive, W32TeX, MacTeXare a large collection of TeX-related software to be downloaded and installed.

1.5 TeX Formats

LaTeX is by far the most common TeX format, however, there are a lot more, such as ConTeXt, OpTeX. Sometimes we refer to Plain TeX as a small set of macros developed by Knuth himself to make TeX more usable.