LaTeX Workshop

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What is LaTeX? [17, 19]

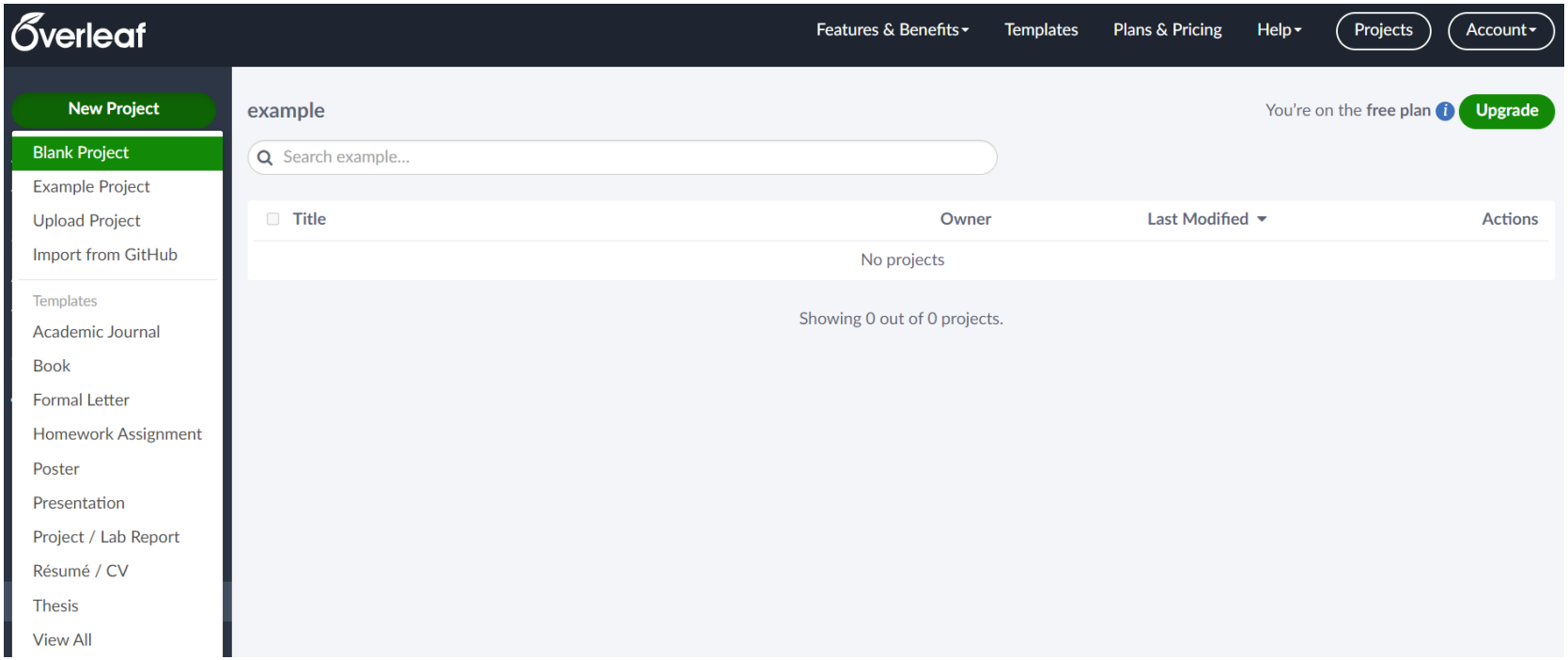
- LaTeX is a tool (running on top of the TeX scripting language) which allows users to easily compile professional-looking documents from a plain text markup file (typesetting).
- LaTeX allows TeX users to define custom behaviors (macros).
- TeX was named by its author, Donald Knuth, after the Greek word τέχνη ('technique').
- The "La" part comes from Leslie Lamont, who extended TeX into LaTeX.
- LaTeX can be pronounced /ˈleɪ.tɛk/, /ˈleɪ.tɛx/, /ˈlɑː.tɛk/, or /ˈlɑː.tɛx/.

Where can I write my LaTeX projects? [12]

- New users: overleaf.com - write, compile, and save your LaTeX projects for free.
- Advanced users who want to work locally need to install at least two things:
  - a local editor such as Texmaker or TeXworks,
  - and a distribution of the TeX language such as MiKTeX or TeX Live.
- The main benefit of working locally is that you can install additional features (packages) that may not be available in Overleaf.
- Almost anything most people could want to do is available in Overleaf.

Want to follow along?

Take a second now to go to overleaf.com and make an account. Once you're in, select "New Project" in the upper-left corner, and choose "Blank Project."



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Fresh .tex file

```
\documentclass[12pt]{article} % specify template
\begin{document} % beginning of content
    Hello world! % a paragraph
\end{document} % end of content
```

Hello world!

- \<command name>
- {<mandatory argument>}
- [<optional argument>]
- % comment - once you type %, the rest of the line is a comment

Other classes

- `beamer` - presentation
- `mlacls` - MLA
- `apa7` - APA
- `elsarticle` - Elsevier
- `acmart` - ACM
- etc...

Separate paragraphs

```
\documentclass[12pt]{article}
\begin{document}
    Hello world! % leave a blank line!

    \LaTeX{} is fun % new paragraph
    \vspace{3mm} % leave a blank line!

    if you're a nerd...
\end{document}
```

Hello world!
LaTeX is fun

if you're a nerd...

You can also "eat space" (shift things up instead of down) by giving a negative value, i.e. `\vspace{-3mm}`.
And just to make sure it's covered - page breaks should be done with `\newpage`.

Simple heading (preamble highlighted)

```
\documentclass[12pt]{article}
\title{My Article} % set title
\author{Me} % set author
\date{\today} % set date to be whatever today is
\begin{document}
    \maketitle % show the heading
    Hello world!
\end{document}
```

My Article

Me

September 29, 2023

Hello world!

Sectioning

```
\part{Title of part}

Some text

\section{Title of section}

Some more text

\subsection{Title of subsection}

Even more text

\subsubsection{Title of subsubsection}

Even more-er-er text
```

Part I
Title of part

Some text

1 Title of section

Some more text

1.1 Title of subsection

Even more text

1.1.1 Title of subsubsection

Even more-er-er text

Text formatting, escape sequences, quotes

```
\textit{italics} \underline{underlined}
\vspace{2mm}

\textbf{bold - ``bf'' = boldface!}
\vspace{2mm}

\texttt{typewriter style - "tt" = teletype!}
\vspace{2mm}

\textbf{\textit{\underline{\texttt{all
together now}}}} \textsc{small caps}
\vspace{2mm}

must be escaped: \&, \%, \$, \#, \_, \{, \},
\textasciitilde, \textasciicircum,
\textbackslash
```

italics underlined

bold - “bf” = boldface!

`typewriter style - "tt" = teletype!`

all together now SMALL CAPS

must be escaped: &, %, $, #, _, {, }, ~, ^, \

Importing (\usepackage{...})

- Packages are extensions to LaTeX that allow you to customize your documents
- Package declarations (\usepackage commands) go in the preamble
- \usepackage[margin=0.5in]{geometry} will give you $\frac{1}{2}$-in margins
- \usepackage[<language1>,...,<languageN>]{babel} allows for the use of non-Latin script
- \usepackage[T1]{fontenc} gives you access to some good fonts
- You can find documentation for most packages at ctan.org.

Font size and typeface

```
{\tiny tiny default}
{\fontfamily{qcr}\selectfont\large large QCR}
{\fontfamily{cmss}\selectfont\Huge Huge CMSS}
```

You can also use packages in the preamble to get more fonts:

```
\usepackage[T1]{fontenc}
\usepackage{<font package name>}
```

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Unordered lists (itemize)

```
\begin{itemize} % unordered list
    \item first item
    \item second item
        \begin{itemize} % sublist
            \item sub-item
            \item sub-item
        \end{itemize}
\end{itemize}
```

- first item
- second item
  - sub-item
  - sub-item

Ordered lists (enumerate)

```
\begin{enumerate} % ordered list
    \item first item
    \item second item
        \begin{enumerate} % sublist
            \item[a.] sub-item
            \item[b.] sub-item
        \end{enumerate}
\end{enumerate}
```

1. first item
2. second item
    a. sub-item
    b. sub-item

Figures with images: \usepackage{graphicx} [1, 18]

```
\begin{figure} % wrap image
    \centering
    \includegraphics[scale=0.5]{capy.png}
    \caption{The humble capybara}
    \label{fig:capy}
\end{figure}
```

Figure 1: The humble capybara

You must declare the package `graphicx` in your preamble for images to work!

Figures with drawings: \usepackage{tikz} [7]

```
\begin{figure} % wrap drawing
    \centering
    \begin{tikzpicture}
    [node/.style={circle, draw=black, thick, minimum size=7mm}]
    \node[node] (s) at (0,0) {$s$};
    \node[node] (p1) at (4,3) {$p_1$};
    \node (dots) at (4,0) {$\vdots$};
    \node[node] (pn) at (4,-3) {$p_{n/2}$};
    \node[node] (x) at (8,0) {$x$};
    \node[node] (t) at (12,0) {$t$};
    \draw[->, thick] (s)--(p1) node[midway, above left] {$a_1$};
    \draw[->, thick] (s)--(pn) node[midway, below left] {$a_{n/2}$};
    \draw[->, thick] (p1)--(x) node[midway, above right] {$\infty$};
    \draw[->, thick] (pn)--(x) node[midway, below right] {$\infty$};
    \draw[->, thick] (x)--(t) node[midway, above] {$S_A-nv/4-1$};
    \end{tikzpicture}
    \caption{A directed acyclic graph (DAG).}
    \label{fig:dag}
\end{figure}
```

Figures with drawings (continued)

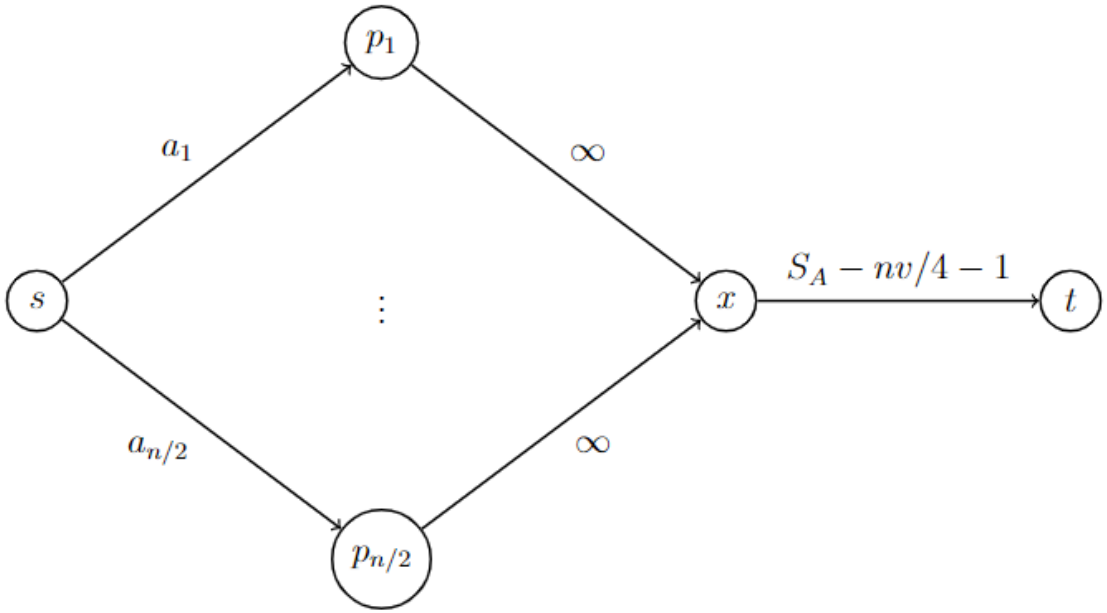

Figure 2: A directed acyclic graph (DAG).

You must declare the package `tikz` in your preamble for drawings to work!

Tables (tabular)

```
\begin{table} % wrap table
    \centering
    \begin{tabular}{c|c|c}
        Mostly Object-Oriented & Functional & Both \\
        \hline
        Java & Lisp & Python \\
        C++ & Haskell & Rust \\
    \end{tabular}
    \caption{Programming languages are generally either
    object-oriented, functional, or multi-paradigm.}
    \label{tab:languages}
\end{table}
```

Mostly Object-Oriented	Functional	Both
Java	Lisp	Python
C++	Haskell	Rust

Table 1: Programming languages are generally either object-oriented, functional, or multi-paradigm.

Last note on "floats" [10]

- Anything wrapped in a `figure` or `table` environment is a "float."
- LaTeX likes to decide where to place floats in your document to make the document look "nice."
- It can be annoying when it makes the wrong choice.
- To overcome this:
  1. `\usepackage{float}`
  2. `\begin{figure}[H]...\end{figure}`

Hyperlinks: \usepackage{hyperref} [16]

```
\usepackage{hyperref} % links
\hypersetup{ % link style
    colorlinks=true,
    linkcolor=red,
    urlcolor=blue,
    pdftitle={LaTeX Workshop Test Document}
}
... % rest of code here
Please refer to Figure \ref{fig:capy}. If you need more information,
please visit \href{https://en.wikipedia.org/wiki/Capybara}{the
Wikipedia page on capybaras.}
```

Please refer to Figure 1. If you need more information, please visit the Wikipedia page on capybaras.

You must declare the package `hyperref` in your preamble for links to work!

Tables of contents

```
\begin{document}
\maketitle % show the heading

\tableofcontents

Hello world! % leave a blank line!

... % rest of code
```

Bibliographies \usepackage{natbib} [3, 8, 9]

```
\usepackage{natbib} % bibliographies
\bibliographystyle{apalike} % bib style
\begin{document}

...

A seminal work on African American English is
\cite{green_african_2002}, a modern and thorough approach
that greatly expanded on earlier work \citep{labov_language_1972}

...

\bibliography{workshop} % display bibliography here
\end{document}
```

Bibliographies (continued)

A seminal work on African American English is Green (2002), a modern and thorough approach that greatly expanded on earlier work (Labov, 1972).

References

Green, L. J. (2002). *African American English: a linguistic introduction*. Cambridge University Press.

Labov, W. (1972). *Language in the inner city: Studies in the Black English vernacular*, volume 3. University of Pennsylvania Press.

You must declare the package `natbib` in your preamble to make bibliographies!
Worth knowing - `\nocite{*}` will print all references regardless of use of `\cite(p){}`.

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Glosses and examples (\usepackage{linguex}) [15]

```
\exg. Siz parti-de \c{s}ark\i{} s\"{o}yle-mek iste-yecek mi-sin-iz?\\
You party-\textsc{loc} song sing-\textsc{inf} % broken line!
want-\textsc{fut} \textsc{q}-2-\textsc{pl}\\
`Will you want to sing at the party?'

\ex.
    \a. \textit{He \textbf{quickly} ran.}
    \b. \textit{\textbf{Quickly,} he ran.}
```

(1) Siz parti-de şarkı söyle-mek iste-yecek mi-sin-iz?
You party-LOC song sing-INF want-FUT Q-2-PL
'Will you want to sing at the party?'

(2) a. *He **quickly** ran.*
b. ***Quickly,** he ran.*

IPA \usepackage{tipa} [13, 5, 14]

```
\textipa{/wIT "tEn.jU\:R "su.zid h\ae v Ol D@ mO\:R "lEZ.\s{\:R}
f\s{\:R} "jAR.IN b2t h\s{\:R} ""p2b.lI"keI.SInz a\:R noU gUd/}
```

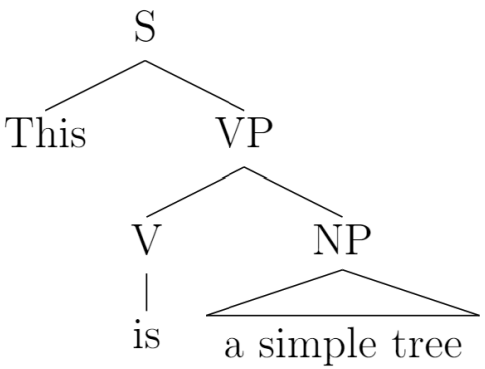
/wɪθ ˈtɛn.jʊɻ ˈsu.zid hæv ɔl ðə mɔɻ ˈlɛʒ.ɻ̩ fɻ̩ ˈjɑr.ɪŋ bʌt hɻ̩ ˌpʌb.lɪˈkeɪ.ʃɪnz aɻ noʊ gʊd/

IMPORTANT! AVOIDS CONFLICTS BETWEEN `linguex` AND `tipa`:

```
\usepackage{linguex}
\NewCommandCopy{\linguexb}{\b}
\NewCommandCopy{\linguexc}{\c}
\NewCommandCopy{\linguexd}{\d}
\usepackage{tipa, etoolbox}
\apptocmd{\Exformat}{
  \RenewCommandCopy{\b}{\linguexb}
  \RenewCommandCopy{\c}{\linguexc}
  \RenewCommandCopy{\d}{\linguexd}}{}{}
```

Syntax Trees \usepackage{qtree} [4]

```
\Tree
[.S
    This
    [.VP
        [.V is ]
        \qroof{a simple tree}.NP
    ]
]
```



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CTAN Archive (ctan.org) [2]

CTAN
Comprehensive TEX Archive Network

- PRO - Detailed and highly-technical documentation for many LaTeX packages available
- PRO - Extensive information
- CON - Difficult to navigate
- CON - Examples are hard to find

StackExchange (tex.stackexchange.com) [6]

- PRO - Opportunity to ask experienced people how to do something
- PRO - Answers are detailed, human-readable, reliable
- CON - You might get ignored
- CON - Your post might get deleted for a silly reason

Overleaf support articles (overleaf.com/learn) [12]

- PRO - Excellent for getting to grips with basic functionality
- PRO - Useful examples
- CON - Doesn't go into much depth
- CON - More detailed/specific guidance is left out

ChatGPT (chat.openai.com) [11]

- PRO - Detailed responses and examples, including for hyperspecific functionality
- PRO - Instant answers (no searching, no waiting)
- CON - Not as reliable (answers are statistically generated, meaning you can get BS answers that seem correct)
- CON - Need to phrase your query carefully to get it to understand you

References I

[1] D. Carlisle. CTAN: Package graphicx. URL https://www.ctan.org/pkg/graphicx.

[2] ctan. CTAN: Comprehensive TeX Archive Network. URL https://ctan.org/.

[3] P. Daly and A. Ogawa. CTAN: Package natbib. URL https://www.ctan.org/pkg/natbib.

[4] A. Dmitriadis. CTAN: Package qtree. URL https://www.ctan.org/pkg/qtree.

[5] egreg. Answer to "Numbering of linguex \ag. starts erroneously with a dot", Apr. 2021. URL https://tex.stackexchange.com/a/591840.

References II

[6] S. Exchange. TeX - LaTeX Stack Exchange. URL https://tex.stackexchange.com/.

[7] C. Feuersänger and H. Menke. CTAN: Package pgf. URL https://www.ctan.org/pkg/pgf.

[8] L. J. Green. *African American English: a linguistic introduction*. Cambridge University Press, 2002.

[9] W. Labov. *Language in the inner city: Studies in the Black English vernacular*, volume 3. University of Pennsylvania Press, 1972.

[10] A. Lingnau. CTAN: Package float. URL https://ctan.org/pkg/float.

References III

[11] OpenAI. Introducing ChatGPT. URL https://openai.com/blog/chatgpt.

[12] Overleaf. Overleaf, Online LaTeX Editor. URL https://www.overleaf.com.

[13] F. Rei. CTAN: Package tipa. URL https://www.ctan.org/pkg/tipa.

[14] R. Rutter. List of pangrams, Oct. 2014. URL https://clagnut.com/blog/2380#English_phonetic_pangrams.

[15] W. Sternefeld. CTAN: Package linguex. URL https://www.ctan.org/pkg/linguex.

[16] L. Team. CTAN: Package hyperref, . URL https://ctan.org/pkg/hyperref.

References IV

[17] L. Team. LaTeX - A document preparation system, . URL https://www.latex-project.org/.

[18] Unknown. The Capybara | Beautiful Animal Interesting Facts | Animals Lover, Apr. 2013. URL http://animalz-lover.blogspot.com/2013/04/Capybara-Amazing-Facts.html.

[19] Wikipedians. LaTeX, Sept. 2023. URL https://en.wikipedia.org/w/index.php?title=LaTeX&oldid=1175855339. Page Version ID: 1175855339.