LATEX and Linguistics
How to make your research pretty

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Outline

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Introduction

What is LaTeX?

- A document preparation system built on top of TeX
- Focus on content, not formatting
  And then focus on fine-grained control of formatting
- Typeset equations, trees, diagrams, etc.
- Auto-generate bibliographies, numbered examples, and more
- Free, customizable, standardized, and infinitely more powerful than MSWord, Google Docs, etc.
Examples

Some things that LATEX makes beautifully & easily:

\([\text{Every}^{\mathcal{M},g} (\text{deputy}^{\mathcal{M},g}) (\text{likes}^{\mathcal{M},g} (\text{Lucy}^{\mathcal{M},g})))\]

(1) I saw Jane.

(2) * I Jane saw.
Examples

Some things that \texttt{LaTeX} makes beautifully & easily:

(3) \texttt{vaja\textasciija\textasciitilde{}av josef mitse\textasciija\textasciitilde{}ajima return.PERF.3.PL.MASC Joseph Egypt.ward}
    ‘Joseph returned to Egypt’ (Genesis 50:14)

(4) \texttt{vaj\textasciija\textasciitilde{}mah\textasciija\textasciitilde{}av ave\textasciija\textasciitilde{}aham ha\textasciija\textasciitilde{}ohela hurry.PERF.3.SG.MASC Abraham DEF.tent.ward}
    ‘Abraham hurried (in)to the tent’ (Genesis 18:6)
Some things that \LaTeX makes beautifully & easily:

\begin{center}
\begin{tikzpicture}
    \tikzstyle{every node}=[font=\footnotesize]
    \node (P1) at (0,0) {$P_1$};
    \node (Pi+) at (2,0) {$P_{i+}$};
    \node (Pn) at (4,0) {$P_n$};
    \node (CC) at (-1,-1) {CC};
    \node (S) at (1,-1) {S};
    \node (P) at (3,-1) {P};
    \node (semantics) at (1,-2) {semantics};
    \node (phonology) at (3,-2) {phonology};

    \path (P1) edge [->] node {LexTransfoms} (Pi+);
    \path (Pi+) edge [->] node {Transforms} (Pj);
    \path (Pj) edge [->] node {Transforms} (Pn);
    \path (P1) edge [->] node {LexTransfoms} (P1);
    \path (Pi+) edge [->] node {Transforms} (Pi+);
    \path (Pj) edge [->] node {Transforms} (Pj);
    \path (Pn) edge [->] node {phonology} (Pn);
    \path (CC) edge [->] node {semantics} (CC);
    \path (S) edge [->] node {semantics} (S);
    \path (P) edge [->] node {phonology} (P);
\end{tikzpicture}
\end{center}
Examples

Some things that LaTeX makes beautifully & easily:

\[
\begin{array}{ccc}
\text{w} & \text{1} & 0 \\
\text{◊P} & \rightarrow & \text{□◊P} \\
\ast & \ast & \\
\end{array}
\]

\[
\begin{array}{ccc}
\text{v} & \text{11} & 0 \\
\text{◊P} & \rightarrow & \text{◊P} \\
\ast & \ast & \\
\end{array}
\]

\[
\begin{array}{ccc}
\text{s} & \text{00} & 0 \\
\ast & \text{◊P} & \\
\end{array}
\]
The Benefits of LaTeX

Why LaTeX over Word or Google Docs?

- Print-ready .pdf output looking exactly how it should
- No compatibility issues with .doc, .docx, .rtf, etc.
- Quick and efficient formatting
  No dragging those little margin nubs to set indentation!
- Looks 1,000,000 times more professional
- Make equations, trees, without 3rd party programs
- Automated numbering, references, bibliographies, TOCs
- Small document size, quick access
- 100% free, massive support community worldwide
- Zero bloatware, zero editing restrictions
- TeX templates provided by publishers, conferences

Seriously, it’s great.
The Benefits of \LaTeX{}

Your text is *Typeset*, not just printed

- Automatic text justification, pagebreaks, hyphenation
- Automatic ligatures:

<table>
<thead>
<tr>
<th>\LaTeX{}</th>
<th>MSWord</th>
</tr>
</thead>
<tbody>
<tr>
<td>__ __</td>
<td>__ __</td>
</tr>
<tr>
<td>&quot;...&quot;</td>
<td>&quot;...&quot;</td>
</tr>
<tr>
<td>stuff</td>
<td>stuff</td>
</tr>
<tr>
<td>stuffing</td>
<td>stuffing</td>
</tr>
<tr>
<td>fly</td>
<td>fly</td>
</tr>
<tr>
<td>first</td>
<td>first</td>
</tr>
</tbody>
</table>

Your text is professional, stylized, ready-to-read
The Benefits of \LaTeX

It’s what the cool kids do!

Jason Baldridge @jasonbaldridge

OH: "This resume is written in that \LaTeX font. It means you're smart."

4:00 PM - 4 Apr 2014

3 4
Installation

\LaTeX is \textbf{free} and available for \textbf{every} operating system.

- PC: MiK\TeX \,(miktex.org)
- Mac: Mac\TeX \,(tug.org/mactex)
- Linux: \TeX Live \,(tug.org/texlive) (often pre-installed)
- Online: ShareLaTeX.com, writeLaTeX.com

On any of these platforms, you have your choice of \TeX editor.

- Like IDEs for programming, \TeX editors (IWEs) are for \LaTeX.
- \url{https://en.wikipedia.org/wiki/Comparison_of_TeX_editors}
- Learn the pseudo-code and write it anywhere!
How to Use It

Writing in \LaTeX{} involves a pseudo-programming language

- Commands and symbols introduced by a backslash
  \texttt{\textbackslash"u ü \textbackslash{c\{c\} ç \textbackslash{v\{z\} ź

- Commands are often intuitive
  $\texttt{\textbackslash\sigma} \quad \texttt{\textbackslash\Sigma}$
  $\texttt{\textbackslash\textipa{S}} \quad \texttt{\textbackslash\textipa{R}}$

- Do math in the “math” environment
  $\texttt{\textbackslash\lambda x} \quad \texttt{\textbackslash\pi \textbackslash{\neq} \textbackslash{\frac{42}{7}}}$

- Text formatting done easy
  \texttt{\textit{italics} \quad \textbf{bold}}
  \texttt{\underline{so cool} \quad \texttt{sout{way cool}}}

Smith & Snider & Wiegand | Cornell Linguistics Circle | \LaTeX{} and Linguistics (29 Sep 2016)
How to Use It

Does this sound familiar to you?

1. “I want this word to be in italics”
2. *Highlights word, presses ctrl+i*
3. [5 minutes later] “Oh I should use a different word”
4. *Highlights word, retypes, loses formatting*
5. *Presses ctrl+i again, presses space bar*
6. *Starts typing next word, it’s in italics*
7. *Highlights second word, presses ctrl+i*
8. [5 minutes later] “Oh I should use a different word…”
9. GOTO 2

NEVER AGAIN!
How to Use It

The \LaTeX{} way:

1. “I want this word to be in italics”
2. \textit{word}
3. [5 minutes later] “Oh I should use a different word”
4. \textit{word}, retypes, that’s it
5. \textit{word}, retypes, \textit{that’s it}
6. Goes on to write the best dissertation since Heim 1982, never worrying about formatting again
How to Use It

- Parameters and options use curly, square brackets
  \begin{tabular}{ccc} begins 3-column table with center-aligned cells

- Manual spacing with \hfill, \hskip, \vskip, etc.
  No more playing around with TAB indentation!
How to Use It

Define symbols with \texttt{\textbackslash newcommand}, redefine with \texttt{\textbackslash def}:

\begin{itemize}
  \item \texttt{\textbackslash newcommand\{\Boxright\}\{\texttt{\textbackslash ensuremath\{\Box\kern-1.5pt\hbox{$\texttt{\textbackslash mathord\{\rightarrow\}$}}\}\}}
    \begin{itemize}
      \item $A\Boxright B$ $ \rightarrow A\Box -> B$
    \end{itemize}
  \item \texttt{\textbackslash newcommand\{\draft\}[1]\{\texttt{\textcolor{red}{\texttt{\textsc{#1}}}\}}\}
    \begin{itemize}
      \item \texttt{\draft\{fix this\}} $ \rightarrow [\texttt{FIX THIS}]$
    \end{itemize}
  \item \texttt{\textbackslash def \llb \{\llbracket\}}
  \item \texttt{\textbackslash def \rrb \{\rrbracket\}}
    \begin{itemize}
      \item $\llb$ dog $\rrb$ $ \rightarrow [\texttt{dog}]$
    \end{itemize}
\end{itemize}
Document Types

\LaTeX offers a variety of built-in, pre-configured, and customizable document classes via `\documentclass`

- `{article}` for papers
- `{beamer}` for presentations (like this!) and posters
- `{book}` for chaptered books, theses, etc.
- several more

Easily modified, customized, parameterized
More Power with Packages

Additional structures and symbols are available with *packages*

- If it has been thought of, it has an associated package

Commonly used in linguistics:

- stmaryrd, amssymb, bbding for symbols
- tipa for IPA symbols
- covington, gb4e for glosses, numbered examples
- natbib for reference management
- qtree, tikz-qtree, xy-ling for syntax trees
- tikz for diagrams/drawings
- ot-tableau for OT tableau
More Power with Packages

Additional structures and symbols are available with *packages*

- If it has been thought of, it has an associated package
- Simply insert `\usepackage{}`
- Many come built-in or automatically added
- Cover a variety of applications and options
- Easy-to-find guides for each
- Thoroughly discussed online
More Power with Packages

Simplify templates and formatting guidelines
- Journals, conferences supply \LaTeX{} style files
- Type your paper, plug in the template, and submit!

Share templates, find some online
- Borrow code for a good linguistics poster
- Share code for a space-squeezing abstract
- Use a template for your CV
- Use Cornell’s official dissertation style file
- Develop your own template for syntax homeworks
- Typeset a book, print it with Cornell’s Espresso Machine
Examples: Tables

Several built-in structures called by \begin{environment}

- Never navigate \textit{Insert} menu again!

\begin{tabular}{|r|c|}
\hline
Subfield & Coolness \\
\hline
Phonology & 4/10 \\
\hline
Semantics & 6/10 \\
\hline
Syntax & 10/10 \\
\hline
\end{tabular}

<table>
<thead>
<tr>
<th>Subfield</th>
<th>Coolness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phonology</td>
<td>4/10</td>
</tr>
<tr>
<td>Semantics</td>
<td>6/10</td>
</tr>
<tr>
<td>Syntax</td>
<td>10/10</td>
</tr>
</tbody>
</table>
Examples: Lists

Several built-in structures called by \texttt{\begin{environment}}

\begin{enumerate}
\item A is for Anaphora
\item B is for $\beta$
\end{enumerate}

Never navigate \texttt{Insert} menu again!

\begin{itemize}
\item A is for Awesome
\item B is for Bulleted List
\end{itemize}
Examples: Trees

Easy-to-install packages give you more power

- Don’t have to use 3rd party apps for trees!

\Tree [.S
  [.DP dogs ]
  [.VP
    [.V love ]
    [.DP cats ]
  ]
]
Examples: Citations

Easy-to-install packages give you more power

- Use bibtex for automatic citations and bibliographies

- \citet{choms68} says X, but we know that Y is true \citep{choms95}

- Chomsky (1968) says X, but we know that Y is true (Chomsky 1995)

- Automatically generates your bibliography in any number of pre-formatted styles (apa, harvard, sp, etc.)
Examples: Examples

Easy-to-install packages give you more power

▷ Use \texttt{gb4e} for automatic examples and references

▷ ...as shown in \texttt{eqref\{todd\}}.

\begin{exe}
\texttt{\ex\label\{todd\} Todd is a semanticianist.}
\end{exe}

▷ ...as shown in (5).

\begin{exe}
(5) Todd is a semanticianist.
\end{exe}
Keeping track of things is a breeze, too

\begin{exe}
  \ex \label{cliff}
  Clifford is a big red dog.
\end{exe}

In example (\ref{cliff}), we can see...

(6) Clifford is a big red dog.

In example (6), we can see...

Works for examples, subexamples, sections, tables, figures...
\textsc{\LaTeX{}} discussion dominates StackOverflow, has its own WikiBook, and is the subject of innumerable blogs

- en.wikibooks.org/wiki/\LaTeX{} – Full documentation
- detexify.kirelabs.org – Draw a symbol, get a \LaTeX{} code
- madebyevan.com/fsm – Generate a Finite State Machine
- tex.stackexchange.com – Q&A
\LaTeX{} is also used by the majority of the department. Some will be more open to helping you than others.

- **Sarah Murray** – \LaTeX{} champion, gives out .tex copies of homework, developed several useful custom document classes and templates

- Feel free to pester Robin, Todd, Zac, Mia, Carol-Rose, Mary, many others
Things You’ll Never Have to Worry About Again

- Accidental text formatting
- Renumbering examples and references (57b)
- Citation style guides [Labov 1968:137]
- Compatibility and printing
- Dumb fonts like Calibri
- Navigating menus and buttons (Insert/Figure/Table...)
- Paying for terrible software
- 3rd party websites or programs
That’s it!

Thanks!

Any questions?