LaTeX Reference Notes

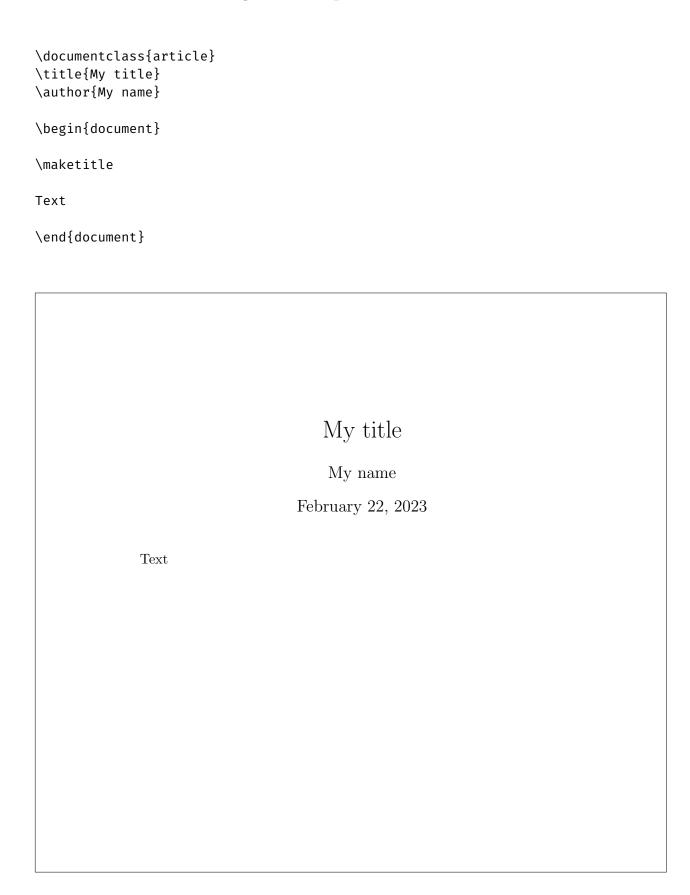
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Part I. Minimal working example



Part II.

General document structure

\section{First level}
Text

\subsection{Second level}
Text

\subsubsection{Third level}
Text

\paragraph{Titled paragraph}
Text

1. First level

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque.

1.1. Second level

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque.

1.1.1. Third level

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque.

Titled paragraph Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque.

Part III. **Examples**

2. Text

2.1. Font style

```
{\itshape text}
                      \textit{text} Italic font shape
{\slshape text}
                      \textsl{text}
                                      Slanted font shape
{\scshape text}
                      \textsc{text}
                                      SMALL CAPITALS FONT SHAPE
                  or
{\bfseries text}
                      \textbf{text} Bold font series
                  or
{\sffamily text}
                      \textsf{text}
                                      Sans-serif font family
                  or
{\ttfamily text}
                      \texttt{text} Monospace font family
                  or
```

Shapes, series and families are commutative properties (e.g. you can have italic bold sans-serif text).

2.2. Font family

Roman \textrm{text}

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. **Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis.** Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. *Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.*

Sans-serif \textsf{text}

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. **Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis.** Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. *Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas*.

Monospace \texttt{text}

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. **Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis.** Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. *Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.*

2.3. Font size

\tiny
\scriptsize
Lorem ipsum dolor sit amet
\footnotesize
Lorem ipsum dolor sit amet
\small
Lorem ipsum dolor sit amet

\LARGE Lorem ipsum dolor sit amet

\huge Lorem ipsum dolor sit amet

\Huge Lorem ipsum dolor sit amet

2.4. Text color

\usepackage{xcolor} [ctan]

\textcolor{green}{text}

text in green

\colorbox{yellow}{\color{red} text}

red text on yellow colorbox

2.5. Lists

ltemize \begin{itemize} \item text \end{itemize}

- Lorem ipsum dolor sit amet, consectetuer adipiscing elit.
- Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi.

Enumerate \begin{enumerate} \item text \end{enumerate}

- 1. Nulla malesuada porttitor diam.
- 2. Quisque ullamcorper placerat ipsum.

Description \begin{description} \item text \end{description}

Name of something Fusce mauris. Vestibulum luctus nibh at lectus. Sed bibendum, nulla a faucibus semper, leo velit ultricies tellus, ac venenatis arcu wisi vel nisl. Vestibulum diam.

Another something Suspendisse vel felis. Ut lorem lorem, interdum eu, tincidunt sit amet, laoreet vitae, arcu. Aenean faucibus pede eu ante. Praesent enim elit, rutrum at, molestie non, nonummy vel, nisl.

2.6. Paragraph alignment

Aligned right {\raggedleft \text \par}

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo.

Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus.

Aligned center {\centering \text \par}

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus.

Aligned left {\raggedright \text \par}

Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus.

2.7. Framed boxes

Short sentences \fbox{ text } Suspendisse vitae elit.

Adjust padding \setlength{\fboxsep}{2em} \fbox{ text }

Suspendisse vitae elit.

Minipage \fbox{\begin{minipage}[pos][height][cpos]{width} text \end{minipage}}

pos selects the reference baseline (top, bottom, or center) and cpos positions the contents within the box (center, top, bottom or spread, but has no effect if the box is not larger than its contents).

2.8. Verbatim

Short sentences \verb|text|

Multiline environment \begin{verbatim} text \end{verbatim}

2.9. Columns

\usepackage{multicol} [ctan]

Balanced columns \begin{multicols}{n} text \end{multicols}

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehi-

cula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Cras viverra metus rhoncus sem. Nulla et lectus vestibulum urna fringilla ultrices. Phasellus eu tellus sit

amet tortor gravida placerat. Integer sapien est, iaculis in, pretium quis, viverra ac, nunc. Praesent eget sem vel leo ultrices bibendum. Aenean faucibus. Morbi dolor nulla, malesuada eu, pulvinar at, mollis ac, nulla. Curabitur auctor semper nulla. Donec varius orci eget risus. Duis nibh mi, congue eu, accumsan eleifend, sagittis quis, diam. Duis eget orci sit amet orci dignissim rutrum.

Define a column break point \columnbreak

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque.

Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris ut leo. Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac

orci et nisl hendrerit mollis. Suspendisse ut massa. Cras nec ante. Pellentesque a nulla. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aliquam tincidunt urna. Nulla ullamcorper vestibulum turpis.

3. Typesetting Math

\usepackage{mathtools} [ctan]

\usepackage{amsfonts} [ctan]

\usepackage{bbm} [ctan]

\usepackage{bm} [ctan]

Inline math \(math \)

$$y_i = \beta_0 + \beta_1 x_{1i} + ... + \beta_k x_{ki} + u_i$$

Displayed math \[math \]

$$y_i = \beta_0 + \beta_1 x_{1i} + ... + \beta_k x_{ki} + u_i$$

Displayed math with numbered equations \begin{equation} math \end{equation}

$$y_i = \beta_0 + \beta_1 x_{1i} + \dots + \beta_k x_{ki} + u_i \tag{1}$$

Consecutive equations \begin{gather} math 1 \\ math 2 \end{gather}

$$y_i = \beta_0 + \beta_1 x_{1i} + \dots + \beta_k x_{ki} + u_i \tag{2}$$

$$y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \beta_3 x_{3i} + u_i$$
 (3)

Aligned equations \begin{align} start & math 1 \\ start & math 2 \end{align}

$$y_i = \beta_0 + \beta_1 x_{1i} + \dots + \beta_k x_{ki} + u_i \tag{4}$$

$$y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \beta_3 x_{3i} + u_i$$
 (5)

Blackboard symbols \(\mathbbm{A > B > C} \) $\mathbb{A} > \mathbb{B} > \mathbb{C}$

Bold symbols \(\bm{\alpha > \beta} \)
$$\alpha > \beta$$

4. Floats

```
\usepackage{graphix} [ctan]
\usepackage{float} [ctan]
\usepackage[font = small, labelfont = bf, labelsep = colon,
justification = centerlast]{caption} [ctan]
```

The placement specifier [H] overrides the program default and places the float *here*.

4.1. Figures

\begin{figure}[H]
\centering
\caption{Bassin de la Seine}
\label{fig:seine}
\includegraphics{seine.png}
\end{figure}



4.2. Tables

\begin{table}[H]
\caption{Bookmark table}
\label{tab:table_a}
\centering
\begin{tabular}{lr}
\toprule
a & b \\ \midrule
1 & 2 \\
3 & 4 \\
5 & 6 \\ \bottomrule
\end{tabular}
\end{table}

Table 1: Simple bookmark table

a
b

1
2

3
4

5
6

4.2.1. Table with notes, special number alignment

```
\usepackage[flushleft, para]{threeparttable} [ctan]
\usepackage{threeparttablex} [ctan]
\usepackage{dcolumn} [ctan]
\usepackage{dcolumn}
\newcolumntype{d}[1]{D{.}{.}{#1}}
% Bottom notes
\begin{ThreePartTable}
\begin{TableNotes}[flushleft]
\item Source: Author's calculation.
\end{TableNotes}
% Table caption, head and foot
\begin{longtable}{ l d{3} d{3} d{3} }
\caption{Table with note, special number alignment} \label{summary_N} \\
\toprule\midrule
 & \textbf{W} & \textbf{X} & \textbf{Y} \\
\midrule
\endhead
\endfoot
\midrule\bottomrule
\insertTableNotes
\endlastfoot
% Table body
Variable A & 7.3
                        8 (1.0)
                                    & 61
                                                 //
Variable B & 29.76
                        & (12.917) & 59.917
                                                 //
Variable C & -0.179
                        8 (0.1)
                                    8 1.2
                                                 //
% Closing
\end{longtable}
\end{ThreePartTable}
```

Table 2: Table with note, special number alignment

	W	X	Y
Variable A	7.3	(1.0)	61
Variable B	29.76	(12.917)	59.917
Variable C	-0.179	(0.1)	1.2

Source: Author's calculation.

5. References

5.1. Links

\usepackage{hyperref} [ctan]
\hypersetup{colorlinks = true, citecolor = blue, urlcolor = blue, linkcolor = blue}

Common uses \href{link}{text} Wikibook on LaTeX

5.2. Cross references

\usepackage[nameinlink, noabbrev]{cleveref} [ctan]

Common uses \cref{label} See table 1. See figure 1. See section 5.

5.3. Footnotes

\usepackage[flushmargin, hang, bottom, stable, multiple]{footmisc} [ctan]
\setlength{\footnotemargin}{\.8em}
\setlength{\footnotesep}{\lambda\setlineskip}

Common uses \footnote{Footnote}

Some text^a and more text.^b

^a Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque.

b Nam dui ligula, fringilla a, euismod sodales, sollicitudin vel, wisi. Morbi auctor lorem non justo. Nam lacus libero, pretium at, lobortis vitae, ultricies et, tellus. Donec aliquet, tortor sed accumsan bibendum, erat ligula aliquet magna, vitae ornare odio metus a mi. Morbi ac orci et nisl hendrerit mollis.

6. Other topics

6.1. Page layout

```
\usepackage[a4paper, centering, hmargin = 3cm, vmargin = 3cm]{geometry} [ctan]
```

6.2. Units

```
Fixed measures  \begin{array}{ccc} pt & Anglo-American \ points \ (inch=72.27 \ pt) \\ cm & centimeters \ (inch=2.54 \ cm) \\ mm & millimeters \ (inch=25.4 \ mm) \\ in & inches \end{array}
```

 $\begin{array}{ccc} \textbf{Relative measures} & em & ems \ of \ the \ current \ point \ size \\ ex & x-height \ of \ the \ current \ font \end{array}$

6.3. White space

```
\thinspace || 1/6 em
\enspace | | 1/2 em
\quad | | 1 em
\qquad | | 2 em
\hspace{#} | # = 4 em
```

7. Bibliography management

```
\usepackage[authordate, backend = biber, abbreviate = false, date = year,
isbn = false, hyperref = false]{biblatex-chicago}
\setcounter{biburllcpenalty}{9000} % Break long sequences
\addbibresource{references.bib} % Bibliography file [ctan]
```

To print all the mentioned bibliographic entries: \printbibliography

To print all bibliographic entries, add \nocite{*} before \printbibliography

References

Flynn, Peter. 2005. Formatting Information: A Beginner's Introduction to Typesetting with LaTeX.

Gratzer, George A. 1996. *Math into LaTeX: An Introduction to LaTeX and AMS-LaTex.* Boston: Birkhäuser.

Kopka, Helmut, and Patrick W. Daly. 2004. *Guide to LaTeX*. 4th ed. Addison-Wesley Series on Tools and Techniques for Computer Typesetting. Boston: Addison-Wesley.

Mittelbach, Frank, Michel Goossens, Johannes Braams, Chris Rowley, and David Carlisle. 2004. *The LaTeX Companion.* 2nd ed. Addison-Wesley Series on Tools and Techniques for Computer Typesetting. Boston: Addison-Wesley.

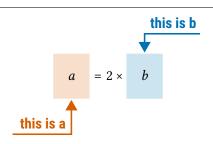
Oetiker, Tobias, Hubert Partl, Irene Hyna, and Elisabeth Schlegl. 2021. *The Not So Short Introduction to LaTeX 2e.* https://ctan.org/pkg/lshort.

A. Bonus: Tikz

A.1. Annotated equations

```
Heavily inspired by [annotated latex equations].
```

```
% In the preamble
\usepackage{tikz}
\usetikzlibrary{arrows, arrows.meta, calc, positioning, mindmap, shapes, tikzmark, trees}
% Highlighting text
\newcommand{\highlight}[2]{\fcolorbox{white}{#1!20}{$\mathrlap{\vphantom{\int}} #2$}}
\newcommand{\highlightdark}[2]{\fcolorbox{white}{#1!50}{$\mathrlap{\vphantom{\int}} #2$}}
% Spacing around highlighted item
\setlength{\fboxrule}{0.5ex}
\setlength{\fboxsep}{0.5ex}
% Default color order
\newcommand{\colora}{red}
\newcommand{\colorb}{blue}
% In the document
\tikzset{every picture/.style = {
            line width = 0.25ex, > = triangle 60, <-,
            nodes = {align = center, inner ysep = 0.75ex},
            remember picture},
            font = {\sffamily\normalsize}}
\[\tikzmarknode{a}{\highlight{\colora}{a}} = 2\times\tikzmarknode{b}{\highlight{\colorb}{b}}\]
\begin{tikzpicture}[overlay]
\path (a.south) ++ (0, -2ex) node[anchor = north east, color = \colora] (text_a)
{\textbf{this is a}};
\draw [color = \colora](a.south) |- ([xshift = -0.3ex, color = \colora] text_a.south west);
\path (b.north) ++ (0, 3ex) node[anchor = south west, color = \colorb] (text_b)
{\textbf{this is b}};
\draw [color = \colorb](b.north) |- ([xshift = -0.3ex, color = \colorb] text_b.south east);
```



B. Preamble for this document

```
% Page layout
\documentclass[paper = a4, numbers = endperiod, captions = heading]{scrartcl} % KOMA style
\usepackage[vmargin = 1in, hmargin = 1in]{geometry}
% Base fonts
\usepackage{libertinus} % rm
\usepackage{libertinust1math} % rm math support
\usepackage[condensed]{roboto} % sf
\renewcommand{\seriesdefault}{m} % fix missing italics of roboto condensed
\usepackage[scale=.9]{FiraMono} % tt
% Encoding
\usepackage[T1]{fontenc}
\usepackage[utf8]{inputenc}
% Language
\usepackage[english]{babel}
% Paragraphs
\setlength{\parindent}{opt} % Indentation
\setlength{\parskip}{\medskipamount} % Space between paragraphs
\usepackage{setspace}
\setstretch{1}% Spacing between lines
% Columns
\usepackage{multicol}
% Control of widows and orphans
\widowpenalty = 10000
\clubpenalty = 10000
% Colors
%%%%%%%%
\usepackage[dvipsnames]{xcolor}
\definecolor{main}{RGB}{0,114,178}
% As per Wong's color blindness scheme (www.nature.com/articles/nmeth.1618)
\definecolor{orange}{RGB}{230,159,0}
\definecolor{light-blue}{RGB}{86,180,233}
\definecolor{green}{RGB}{0,158,115}
\definecolor{yellow}{RGB}{240,228,66}
\definecolor{blue}{RGB}{0,114,178}
\definecolor{red}{RGB}{213,94,0}
\definecolor{purple}{RGB}{204,121,167}
% Extra
\definecolor{dark-blue}{RGB}{0,51,102}
\definecolor{dark-red}{RGB}{139,0,0}
\definecolor{dark-green}{RGB}{0,100,80}
\definecolor{dark-purple}{RGB}{90,0,90}
\definecolor{brown}{RGB}{166,86,40}
\definecolor{gray}{gray}{0.50}
\definecolor{dark-gray}{gray}{0.40}
```

```
\definecolor{plot-red}{HTML}{C71E1D}
\definecolor{plot-light-blue}{HTML}{18A1CD}
\definecolor{plot-blue}{HTML}{1D81A2}
\definecolor{plot-dark-blue}{HTML}{15607A}
\definecolor{plot-light-green}{HTML}{ooDCA6}
\definecolor{plot-green}{HTML}{09BB9F}
\definecolor{plot-dark-green}{HTML}{009076}
\definecolor{plot-gray}{HTML}{C4C4C4}
\definecolor{plot-dark-red}{HTML}{C71E1D}
\definecolor{plot-orange}{HTML}{FA8Coo}
% Floats
%%%%%%%%
\usepackage{graphicx, float, wrapfig}
% Space above and below floats
\setlength{\intextsep}{1\baselineskip}
\setlength{\textfloatsep}{1\baselineskip}
% Captions
\setkomafont{caption}{\small\sffamily\bfseries}
\setkomafont{captionlabel}{\small\sffamily\bfseries}
\usepackage{caption}
\captionsetup{justification = centerlast, width = 0.85\textwidth}
\newcommand\notebelow[1]{\setkomafont{caption}{\footnotesize}\captionbelow*{#1}}
% Tables
%%%%%%%%
\usepackage{array, multirow, subcaption, makecell, colortbl}
\usepackage{booktabs} % Use toprule, midrule and bottomrule
\usepackage{longtable} % Span multiple pages
\usepackage{pdflscape} % Use landscape pages
\usepackage[flushleft, para]{threeparttable}
\usepackage{threeparttablex} % Add notes under a longtable
% Centered column with given decimal places: d{#}
\usepackage{dcolumn}
\newcolumntype{d}[1]{D{.}{.}{#1}}
% Columns with fixed width: L{} C{} R{}
\newcolumntype{L}[1]{>{\raggedright\let\newline\\\arraybackslash\hspace{opt}}m{#1}}
\newcolumntype{C}[1]{>{\centering\let\newline\\\arraybackslash\hspace{opt}}m{#1}}
\newcolumntype{R}[1]{>{\raggedleft\let\newline\\\arraybackslash\hspace{opt}}m{#1}}
% Math
%%%%%%
\usepackage{mathtools, amsfonts, amsmath, amsthm, amssymb}
\usepackage{bbm} % blackboard math characters with \mathbbm{}
\usepackage{bm} % bold math with \bm{}
% Tikz
%%%%%%
```

\definecolor{light-gray}{gray}{0.95}

```
\usepackage{tikz}
\usetikzlibrary{arrows, arrows.meta, calc, positioning, mindmap, shapes, tikzmark, trees}
% Highlighting text
\newcommand{\highlight}[2]{\fcolorbox{white}{#1!20}{$\mathrlap{\vphantom{\int}} #2$}}
\newcommand{\highlightdark}[2]{\fcolorbox{white}{#1!50}{$\mathrlap{\vphantom{\int}} #2$}}
% Spacing around highlighted item
\setlength{\fboxrule}{0.5ex}
\setlength{\fboxsep}{0.5ex}
% Default color order
\newcommand{\colora}{red}
\newcommand{\colorb}{blue}
\newcommand{\colorc}{green}
% Common parameters
\tikzset{
    every picture/.style = {
        line width = 0.25ex, > = triangle 60, <-,
        nodes = {align = center, inner ysep = 0.75ex},
        remember picture},
        font = {\sffamily\normalsize}}
% Links
%%%%%%%%
\usepackage{hyperref}
\hypersetup{colorlinks = true, allcolors = main}
\usepackage[nameinlink, noabbrev]{cleveref} % Clever cross-reference (loaded after hyperref)
% References
\usepackage[authordate, backend = biber, abbreviate = false, date = year, isbn = false, hyperref
\addbibresource{references.bib}
\urlstyle{same} % Avoid verbatim fields in bibliography
\setcounter{biburllcpenalty}{9000} % Break number sequences
% Footnotes (overwriting Chicago's default)
\usepackage[flushmargin, hang, bottom, stable, multiple]{footmisc}
\setlength{\footnotemargin}{.8em}
\setlength{\footnotesep}{1\baselineskip}
% Misc
%%%%%%
\usepackage{soul} % highlight and underline
\sethlcolor{yellow}
%\overfullrule = 2cm % Highlight overfull issues
\usepackage{lipsum} % placeholder text
% \pagenumbering{gobble} % Suppress page number
\setlength{\fboxsep}{1em} % Padding inside fboxes
\setlength\fboxrule{0.2pt} % Linw width for fboxes
```