

# Demo of My L<sup>A</sup>T<sub>E</sub>X Style

Hassium

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## 1 Packages

This style contains the following packages:

```
\usepackage[T1]{fontenc}
\usepackage[explicit]{titlesec}
\usepackage[utf8]{inputenc}
\usepackage{amsmath,amsthm,amssymb,amsfonts,mathrsfs,mathtools,nicematrix,chngecntr,
centernot,ytableau,tikz-cd}
\usepackage{imakeidx,textcomp,tocloft,envron,setspace,geometry,enumerate,
enumitem,blindtext,multicol,xcolor,fancyhdr,calligra,graphicx,wrapfig,pgfplots,
mdframed,tabularx,lipsum,comment,csquotes,verbatim,transparent,scalerel,halloweenmath}
\usepackage[backend=biber,style=alphabetic,sorting=ynt]{biblatex}
\usepackage[hidelinks]{hyperref}
\usepackage{chemfig}
```

How to insert it?

```
\documentclass{article}
\input{hassium.tex} % Download and input it using its path
```

## 2 Title Page Setup

After inserting the package, you should define the title and author name. Here is an example, which is the code of this demo:

```
\documentclass{article}
\input{hassium.tex}
\begin{document}
  \def\htitle{Demo of Hassium Style}
  \def\hauthor{Hassium}
  \def\hfauthor{Hassium}
  \hsetup
  \htoc
  \hmain
```

```
\end{document}
```

Here the “hfauthor” is the left part of the header.

### 3 Page Geometry

There are some commands that adjust the geometry of the document:

```
\geometry{letterpaper, top=54pt,bottom=46.8pt,marginparsep=5.67pt,marginparwidth=56.69pt,
voffset=0pt,hoffset=0pt,left=54pt,right=54pt,headheight=24pt,headsep=10pt}
\setstretch{1.25} % spacing
```

### 4 More on Table of Contents

You can add descriptions to each section and the description will appear in the table of contents, directly below the section name:

```
\section{This is a Sample Section}
\descr{This is a description to the section}
```

The table of contents only shows the section names, but no subsections and numberless sections. If you want a numberless section in the table of contents, use the “newsection” command:

```
\newsection{This is a numberless section}
```

Note that the section names in the table of contents are hyperlinks; click on any section name to navigate directly to that section. You can do the converse to navigate to the first page as well.

### 5 Index Page

This style has a customized index page. Check the code:

```
This is a \hdef{defintiion}. This is another \hdef{vocabulary}.
\hindex
```

The command “hdef” mark the word and print it. The command “hindex” is a customized index page that print words in three columns. Each page number in the index page contains a hyperlink to that page.

### 6 Darkmode

Darkmode command changes the background color to black and the text to white.

```
\begin{document}
  \darkmode
\end{document}
```

## 7 Other Environments and Commands

The line-spacing in “enumerate” environment is changed:

```
\setlist[enumerate]{topsep=0pt,itemsep=-1ex,partopsep=1ex,parsep=1ex}
```

The “level” environment is used in “enumerate” environment, consider the following code:

```
\begin{enumerate}
  \item This is the first line.
  \begin{level}
    \item This is the second line.
    \begin{level}
      \item This is the third line.
    \end{level}
  \end{level}
  \item This is another line.
\end{enumerate}
```

This code gives:

1. This is the first line.
2. This is the second line.
3. This is the third line.
4. This is another line.

The command “circled” draws a small circle and you can add something inside the circle:

```
\circled{1}
```

The output is ①. You can write any Roman numerals by:

```
\rom108
```

There are two simple commands for hand-written fonts:

```
\cfd{font 1}
\cfc{font 2}
```

The outputs are *font 1* and *font 2*.

## 8 Quiver

Quiver is done by varkor and AndréC, check their github for more information. I include quiver to draw curve arrows in a commutative diagram. To draw a diagram with quiver, check this website. An example is given below:

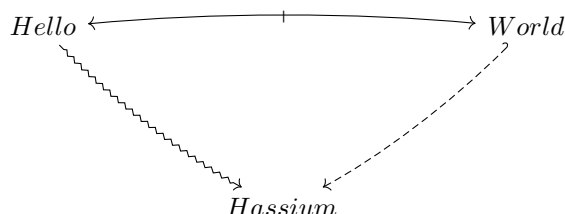
```
% chktex-file 15 % the three lines enables useless warnings
% chktex-file 17
% chktex-file 18
\begin{center}
  \begin{tikzcd}
    Hello & \&\&\& World \\
    & \backslash \\
    & \backslash
  \end{tikzcd}
\end{center}
```

```

&& Hassium
\arrow["\shortmid"{marking}, curve={height=-6pt}, tail reversed, from=1-1, to=1-5]
\arrow[curve={height=6pt}, squiggly, from=1-1, to=4-3]
\arrow[curve={height=-6pt}, dashed, hook', from=1-5, to=4-3]
\end{tikzcd}
\end{center}

```

The diagram looks like:



## 9 Theorem Styles

Several theorem styles are offered:

```

\theoremstyle{definition}
\newtheorem{definition}{Definition}[section]
\newtheorem{theorem}{Theorem}[section]
\newtheorem*{proposition}{Proposition}
\newtheorem*{lemma}{Lemma}
\newtheorem*{corollary}{Corollary}
\newtheorem*{example}{Example}
\newtheorem*{remark}{Remark}
\newtheorem*{notation}{Notation}

```

There is a “hdefinition” environment, which works exactly the same as “definition” if you write:

```

\begin{hdefinition}
  This is a definition of Hassium.
\end{hdefinition}

```

If you include a name variable, it gives an index to the name.

```

\begin{hdefinition}[Hassium]
  This is a definition of Hassium
\end{hdefinition}
\hindex % This will print Hassium

```

The environment name can be customized by using:

```

\customtheorem{This is a custom theorem}
\begin{This is a custom theorem}
  The proof is trivial.
\end{This is a custom theorem}

```

The output environment is:

**This is a custom theorem.** The proof is trivial.

You can put any number or label in “exercise” environment:

```
\begin{exercise}[8.6]
  The proof is trivial.
\end{exercise}
```

The environment looks like:

**Exercise 8.6.** The proof is trivial.

## 10 Invisible Proofs

The environment “reviewmode” is originally done by my friend ETwilight. It replaces your “proof” environment by three empty lines:

```
\begin{reviewmode}
  \begin{proof}
    The proof is trivial.
  \end{proof}
\end{reviewmode}
```

## 11 Simple Commands in Math Mode

I will give a table of all commands in math mode.

$\backslash bs$	$\backslash$	$\backslash al$	$\alpha$
$\backslash N$	$\mathbb{N}$	$\backslash be$	$\beta$
$\backslash Z$	$\mathbb{Z}$	$\backslash ga$	$\gamma$
$\backslash Q$	$\mathbb{Q}$	$\backslash de$	$\delta$
$\backslash R$	$\mathbb{R}$	$\backslash ep$	$\epsilon$
$\backslash C$	$\mathbb{C}$	$\backslash si$	$\sigma$
$\backslash bb\{H\}$	$\mathbb{H}$	$\backslash la$	$\lambda$
$\backslash ca\{H\}$	$\mathcal{H}$	$\backslash ka$	$\kappa$
$\backslash fr\{H\}$	$\mathfrak{H}$	$\backslash om$	$\omega$
$\backslash T$	$\mathcal{T}$	$\backslash Ga$	$\Gamma$
$\backslash Pn\{n\}$	$\mathbb{P}^n$	$\backslash De$	$\Delta$
$\backslash CP\{n\}$	$\mathbb{CP}^n$	$\backslash Si$	$\Sigma$
$\backslash RP\{n\}$	$\mathbb{RP}^n$	$\backslash LA$	$\Lambda$
$\backslash Sym$	$Sym$	$\backslash Om$	$\Omega$
$\backslash GL$	$GL$	$\backslash vp$	$\varphi$
$\backslash SL$	$SL$	$\backslash vt$	$\vartheta$
$\backslash Mod$	$Mod$	$\backslash ve$	$\varepsilon$
$\backslash Sg$	$\mathfrak{S}$	$\backslash ua$	$\uparrow$
$\backslash Ag$	$\mathfrak{A}$	$\backslash da$	$\downarrow$
$\backslash Cay$	$Cay$	$\backslash Ra$	$\Rightarrow$
$\backslash uni$	$\exists !$	$\backslash La$	$\Leftarrow$

$\backslash\mathrm{Ua}$	$\Uparrow$	$\backslash\mathrm{defa}$	$\coloneqq$
$\backslash\mathrm{Da}$	$\Downarrow$	$\backslash\mathrm{sdp}$	$\rtimes$
$\backslash\mathrm{nRa}$	$\nrightarrow$	$\backslash\mathrm{inv}\{f\}$	$f^{-1}$
$\backslash\mathrm{nLa}$	$\nmod$	$x\backslash\mathrm{mod}\ y$	$x \bmod y$
$\backslash\mathrm{hra}$	$\hookrightarrow$	$\backslash\mathrm{Cl}$	$\mathrm{Cl}$
$\backslash\mathrm{hla}$	$\leftarrow$	$\backslash\mathrm{Hol}$	$\mathrm{Hol}$
$\backslash\mathrm{lt}$	$\rightsquigarrow$	$\backslash\mathrm{comp}$	$\circ$
$\backslash\mathrm{mt}$	$\mapsto$	$\backslash\mathrm{Gal}$	$\mathrm{Gal}$
$\backslash\mathrm{rat}$	$\rightharpoonup$	$\backslash\mathrm{card}\{S\}$	$ S $
$\backslash\mathrm{lat}$	$\leftarrow$	$\backslash\mathrm{im}$	$\mathrm{im}$
$\backslash\mathrm{thra}$	$\rightarrow$	$\backslash\mathrm{norm}\{M\}$	$\ M\ $
$\backslash\mathrm{thla}$	$\leftarrow$	$\backslash\mathrm{po}$	$\prec$
$\backslash\mathrm{bij}$	$\xrightarrow{\sim}$	$\backslash\mathrm{poe}$	$\preceq$
$\backslash\mathrm{wb}\{A\}$	$\overline{A}$	$\backslash\mathrm{cyc}\{g\}$	$\langle g \rangle$
$\backslash\mathrm{id}$	$\mathrm{id}$	$\backslash\mathrm{Spec}$	$\mathrm{Spec}$
$\backslash\mathrm{sub}$	$\subset$	$\backslash\mathrm{Syl}$	$\mathrm{Syl}$
$\backslash\mathrm{sube}$	$\subseteq$	$\backslash\mathrm{iso}$	$\approx$
$\backslash\mathrm{supe}$	$\supseteq$	$\backslash\mathrm{niso}$	$\not\approx$
$\backslash\mathrm{nsb}$	$\not\subset$	$\backslash\mathrm{Mor}$	$\mathrm{Mor}$
$\backslash\mathrm{nsup}$	$\not\supset$	$\backslash\mathrm{Aut}$	$\mathrm{Aut}$
$\backslash\mathrm{nsube}$	$\not\subseteq$	$\backslash\mathrm{End}$	$\mathrm{End}$
$\backslash\mathrm{nsupe}$	$\not\supseteq$	$\backslash\mathrm{Hom}$	$\mathrm{Hom}$
$\backslash\mathrm{subn}$	$\subsetneq$	$\backslash\mathrm{Inn}$	$\mathrm{Inn}$
$\backslash\mathrm{supn}$	$\supsetneq$	$\backslash\mathrm{Out}$	$\mathrm{Out}$
$\backslash\mathrm{es}$	$\emptyset$	$\backslash\mathrm{Iso}$	$\mathrm{Iso}$
$\backslash\mathrm{sm}$	$\backslash$	$\backslash\mathrm{Ob}$	$\mathrm{Ob}$
$\backslash\mathrm{ps}$	$\mathscr{P}$	$\backslash\mathrm{cop}\{C\}$	$\mathcal{C}^{\mathrm{op}}$
$\backslash\mathrm{Un}$	$\bigcup$	$\backslash\mathrm{tri}$	$\triangle$
$\backslash\mathrm{In}$	$\bigcap$	$\backslash\mathrm{pa}$	$\partial$
$\backslash\mathrm{Du}$	$\bigsqcup$	$\backslash\mathrm{Ann}$	$\mathrm{Ann}$
$\backslash\mathrm{cp}$	$\mathrm{II}$	$\backslash\mathrm{dom}$	$\mathrm{dom}$
$\backslash\mathrm{Cp}$	$\mathrm{II}$	$\backslash\mathrm{ran}$	$\mathrm{ran}$
$\backslash\mathrm{ot}$	$\otimes$	$\backslash\mathrm{cod}$	$\mathrm{cod}$
$\backslash\mathrm{op}$	$\oplus$	$\backslash\mathrm{A}\{n\}$	$\mathbb{A}^n$
$\backslash\mathrm{acts}$	$\curvearrowright$	$\backslash\mathrm{sq}$	$\square$
$\backslash\mathrm{Span}$	$\mathrm{span}$	$\backslash\mathrm{CAT}$	$\mathrm{CAT}$
$\backslash\mathrm{sgn}$	$\mathrm{sgn}$	$\backslash\mathrm{fl}\{A\}$	$[A]$
$\backslash\mathrm{nsg}$	$\leq$	$\backslash'$	$'$

## 12 Acknowledgement

Special thanks to  $\mathcal{FSG}$ ; his advice on style has been invaluable.