

# 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,chgcntr,
centernot,ytableau,tikz-cd}
\usepackage{imakeidx,textcomp,tocloft,environ,setspace,geometry,enumerate,
enumitem,blindtext,multicol,xcolor,fancyhdr,calligra,graphicx,
wrapfig,pgfplots,mdframed,tabularx,lipsum,comment,csquotes,verbatim}
\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}
  \hsetup
  \htoc
  \hmain
\end{document}
```

### 3 General 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. If you are using the “htoc” command with the darkmode, please use “darkhtoc”. I will combine the functions later after the exam. Use the commands by:

```
\begin{document}
  \darkmode
  \darkhtoc
\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{level}
\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:

```
\rom2024 % replace 2024 by any number you want
```

There are two simple commands for hand-written fonts:

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

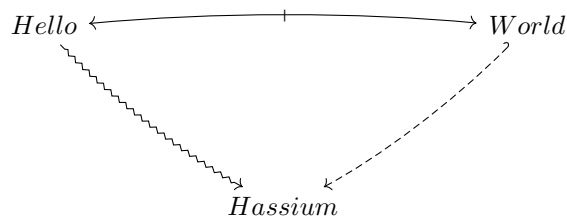
The outputs are *font 1* and *font 2*.

## 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 & \\
    & \searrow & & & \\
    & & \searrow & & \\
    & & & & \text{\&\& 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}
\index % 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{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.

$\backslash bs$	$\backslash$	$\backslash ve$	$\varepsilon$
$\backslash N$	$\mathbb{N}$	$\backslash ua$	$\uparrow$
$\backslash Z$	$\mathbb{Z}$	$\backslash da$	$\downarrow$
$\backslash Q$	$\mathbb{Q}$	$\backslash Ra$	$\Rightarrow$
$\backslash R$	$\mathbb{R}$	$\backslash La$	$\Leftarrow$
$\backslash C$	$\mathbb{C}$	$\backslash Ua$	$\Uparrow$
$\backslash bb\{H\}$	$\mathbb{H}$	$\backslash Da$	$\Downarrow$
$\backslash ca\{H\}$	$\mathcal{H}$	$\backslash nRa$	$\nRightarrow$
$\backslash fr\{H\}$	$\mathfrak{H}$	$\backslash nLa$	$\nLeftarrow$
$\backslash T$	$\mathcal{T}$	$\backslash hra$	$\hookrightarrow$
$\backslash Pn\{1\}$	$\mathbb{P}^1$	$\backslash hla$	$\leftarrow$
$\backslash CP\{1\}$	$\mathbb{CP}^1$	$\backslash lt$	$\rightsquigarrow$
$\backslash RP\{1\}$	$\mathbb{RP}^1$	$\backslash mt$	$\mapsto$
$\backslash Sym$	$Sym$	$\backslash rat$	$\mapsto$
$\backslash GL$	$GL$	$\backslash lat$	$\leftarrow$
$\backslash SL$	$SL$	$\backslash thra$	$\rightarrow$
$\backslash Mod$	$Mod$	$\backslash thla$	$\leftarrow$
$\backslash Sg$	$\mathfrak{S}$	$\backslash bij$	$\xrightarrow{\sim}$
$\backslash Ag$	$\mathfrak{A}$	$\backslash wb\{A\}$	$\overline{A}$
$\backslash Cay$	$Cay$	$\backslash id$	$id$
$\backslash uni$	$\exists !$	$\backslash sub$	$\subset$
$\backslash al$	$\alpha$	$\backslash sube$	$\subseteq$
$\backslash be$	$\beta$	$\backslash supe$	$\supseteq$
$\backslash ga$	$\gamma$	$\backslash nsub$	$\not\subset$
$\backslash de$	$\delta$	$\backslash nsup$	$\not\supset$
$\backslash ep$	$\epsilon$	$\backslash nsube$	$\not\subseteq$
$\backslash si$	$\sigma$	$\backslash nsupe$	$\not\supseteq$
$\backslash la$	$\lambda$	$\backslash subn$	$\subsetneq$
$\backslash ka$	$\kappa$	$\backslash supn$	$\supsetneq$
$\backslash om$	$\omega$	$\backslash es$	$\emptyset$
$\backslash vp$	$\varphi$	$\backslash sm$	$\backslash$
$\backslash vt$	$\vartheta$	$\backslash ps$	$\mathcal{P}$

<code>\Un</code>	$\bigcup$	<code>\norm{M}</code>	$\ M\ $
<code>\In</code>	$\bigcap$	<code>\po</code>	$\preceq$
<code>\Du</code>	$\sqcup$	<code>\cyc{g}</code>	$\langle g \rangle$
<code>\cp</code>	$\amalg$	<code>\Spec</code>	$\mathrm{Spec}$
<code>\Cp</code>	$\coprod$	<code>\Syl</code>	$\mathrm{Syl}$
<code>\ot</code>	$\otimes$	<code>\iso</code>	$\approx$
<code>\op</code>	$\oplus$	<code>\niso</code>	$\not\approx$
<code>\acts</code>	$\curvearrowright$	<code>\Mor</code>	$\mathrm{Mor}$
<code>\Span</code>	$\mathrm{span}$	<code>\Aut</code>	$\mathrm{Aut}$
<code>\sgn</code>	$\mathrm{sgn}$	<code>\End</code>	$\mathrm{End}$
<code>\nsg</code>	$\trianglelefteq$	<code>\Hom</code>	$\mathrm{Hom}$
<code>\defa</code>	$\coloneqq$	<code>\Inn</code>	$\mathrm{Inn}$
<code>\sdp</code>	$\rtimes$	<code>\Out</code>	$\mathrm{Out}$
<code>\inv{f}</code>	$f^{-1}$	<code>\Iso</code>	$\mathrm{Iso}$
<code>1\mod 2</code>	$1 \bmod 2$	<code>\Ob</code>	$\mathrm{Ob}$
<code>\Cl</code>	$\mathrm{Cl}$	<code>\cop{C}</code>	$\mathbb{C}^{\mathrm{op}}$
<code>\Hol</code>	$\mathrm{Hol}$	<code>\tri</code>	$\triangle$
<code>\comp</code>	$\circ$	<code>\pa</code>	$\partial$
<code>\Gal</code>	$\mathrm{Gal}$	<code>\Ann</code>	$\mathrm{Ann}$
<code>\card{S}</code>	$ S $	<code>\dom</code>	$\mathrm{dom}$
<code>\im</code>	$\mathrm{im}$	<code>\cod</code>	$\mathrm{cod}$

## 12 Acknowledgement

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