

# 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,sansmath,tikz-cd,pgfplots,tikz-3dplot}
\usepackage{imakeidx,textcomp,tocloft,environ,setspace,geometry,enumerate,enumitem,
blindtext,multicol,xcolor,fancyhdr,calligra,graphicx,etoolbox,wrapfig,mdframed,
tabularx,lipsum,comment,csquotes,verbatim,transparent,scalerel,ragged2e,
halloweenmath,manfnt,relsize,nameref}
\usepackage[hidelinks]{hyperref}
\usepackage{chemfig}
```

How to insert it?

```
\documentclass{article}
\input{hassium.tex}
```

## 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}

```

The command “hsetup” gives you the title and the author name. The command “htoc” gives a table of contents, which we will mention later. The command “hmain” is a setup of the mainmatter, which includes a fancy header. The “hfauthor” variable is the left part of the header. Also, feel free to use “hstart” command to include all three of them.

```

\documentclass{article}
\input{hassium.tex}
\begin{document}
\def\htitle{Demo of Hassium Style}
\def\hauthor{Hassium}
\def\hfauthor{Hassium}
\hstart
\end{document}

```

### 3 Page Geometry

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

```

\geometry{letterpaper,top=60pt,bottom=60pt,left=60pt,right=60pt,headheight=12pt,
headsep=10pt}
\setstretch{1.25}

```

### 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 commands change the background color to black and the text to white. Similar to the normal setup, there are darkmode setup:

```
\darkhsetup
\darkhtoc
\darkhmain
```

## 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}
```

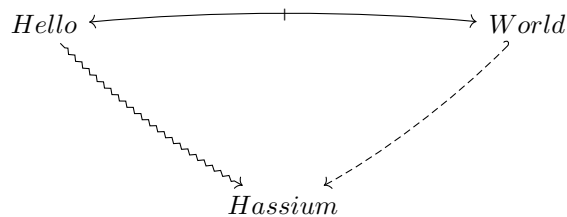
The outputs are *font 1* and *font 2*.

## 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:

```
\begin{center}
  \begin{tikzcd}
    Hello & \&\&\& World \\
    & \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}
\newtheorem{problem}{Problem}[section]
\newtheorem*{claim}{Claim}
```

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 will be:

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

If you don't want to include section number but still want to have a counter in a single section, please use:

```
\begin{adefinition}
  A definition in appendix.
\end{adefinition}
\begin{atheorem}
  A theorem in appendix.
\end{atheorem}
```

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:

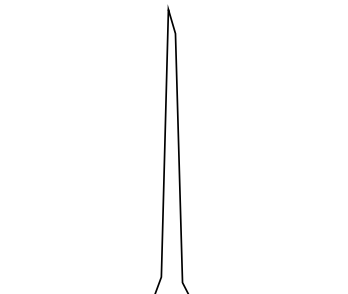
```
\begin{reviewmode}
  \begin{proof}
    The proof is trivial.
  \end{proof}
\end{reviewmode}
```

## 11 Drawing Functions

To draw a function, you may use the following code:

```
\functiondraw{0.8}{-10}{10}{exp(x^-2*sin(deg(x)))}
```

The first parameter is the scale of your plot. The second and the third is the domain of the plot, in our example, the domain is  $[-1, 1]$ . The last entry is for your function. For the format of the function, please check the pgfplots package. The example code (with centering) yields the following plot.



## 12 Simple Commands in Math Mode

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

|                       |                      |                           |                     |
|-----------------------|----------------------|---------------------------|---------------------|
| $\backslash ua$       | $\uparrow$           | $\backslash dom$          | $\text{dom}$        |
| $\backslash da$       | $\downarrow$         | $\backslash cod$          | $\text{cod}$        |
| $\backslash Ra$       | $\Rightarrow$        | $\backslash colim$        | $\text{colim}$      |
| $\backslash La$       | $\Leftarrow$         | $\backslash cat\{C\_S\}$  | $C_S$               |
| $\backslash Ua$       | $\Uparrow$           | $\backslash Cl$           | $Cl$                |
| $\backslash Da$       | $\Downarrow$         | $\backslash CAT$          | $CAT$               |
| $\backslash nRa$      | $\nRightarrow$       | $\backslash card\{1\}$    | $ 1 $               |
| $\backslash nLa$      | $\nLeftarrow$        | $\backslash sq$           | $\square$           |
| $\backslash hra$      | $\hookrightarrow$    | $\backslash largediamond$ | $\diamond$          |
| $\backslash hla$      | $\hookleftarrow$     | $\backslash defa$         | $:=$                |
| $\backslash lt$       | $\rightsquigarrow$   | $\backslash pa$           | $\partial$          |
| $\backslash mt$       | $\mapsto$            | $\backslash d$            | $d$                 |
| $\backslash rat$      | $\rightharpoonup$    | $\backslash Ext$          | $\text{Ext}$        |
| $\backslash lat$      | $\leftarrow$         | $\backslash Tor$          | $\text{Tor}$        |
| $\backslash thra$     | $\rightarrow$        | $\backslash fl\{1\}$      | $[1]$               |
| $\backslash thla$     | $\leftarrow$         | $\backslash al$           | $\alpha$            |
| $\backslash bij$      | $\xrightarrow{\sim}$ | $\backslash be$           | $\beta$             |
| $\backslash Ann$      | $\text{Ann}$         | $\backslash ga$           | $\gamma$            |
| $\backslash A\{1\}$   | $A^1$                | $\backslash de$           | $\delta$            |
| $\backslash ab$       | $ab$                 | $\backslash ep$           | $\epsilon$          |
| $\backslash can$      | $can$                | $\backslash si$           | $\sigma$            |
| $\backslash Can$      | $\text{Can}$         | $\backslash la$           | $\lambda$           |
| $\backslash Rel$      | $\text{Rel}$         | $\backslash ka$           | $\kappa$            |
| $\backslash Cycl$     | $\text{Cycl}$        | $\backslash om$           | $\omega$            |
| $\backslash SCan$     | $\text{SCan}$        | $\backslash Ga$           | $\Gamma$            |
| $\backslash Cay$      | $\text{Cay}$         | $\backslash De$           | $\Delta$            |
| $\backslash bb\{H\}$  | $\mathbb{H}$         | $\backslash Si$           | $\Sigma$            |
| $\backslash ca\{H\}$  | $\mathcal{H}$        | $\backslash LA$           | $\Lambda$           |
| $\backslash fr\{H\}$  | $\mathfrak{H}$       | $\backslash Om$           | $\Omega$            |
| $\backslash scr\{H\}$ | $\mathscr{H}$        | $\backslash vt$           | $\vartheta$         |
| $\backslash comp$     | $\circ$              | $\backslash vp$           | $\varphi$           |
| $\backslash iso$      | $\approx$            | $\backslash ve$           | $\varepsilon$       |
| $\backslash niso$     | $\napprox$           | $\backslash acts$         | $\curvearrowright$  |
| $\backslash Mor$      | $\text{Mor}$         | $\backslash Gal$          | $\text{Gal}$        |
| $\backslash Aut$      | $\text{Aut}$         | $\backslash cyc\{1\}$     | $\langle 1 \rangle$ |
| $\backslash End$      | $\text{End}$         | $\backslash Ht$           | $ht$                |
| $\backslash Hom$      | $\text{Hom}$         | $\backslash Hol$          | $\text{Hol}$        |
| $\backslash Inn$      | $\text{Inn}$         | $\backslash id$           | $\text{id}$         |
| $\backslash Out$      | $\text{Out}$         | $\backslash im$           | $\text{im}$         |
| $\backslash Iso$      | $\text{Iso}$         | $\backslash inv\{1\}$     | $1^{-1}$            |
| $\backslash Ob$       | $\text{Ob}$          | $x \backslash mod y$      | $x \bmod y$         |

|                                |                 |                              |                    |
|--------------------------------|-----------------|------------------------------|--------------------|
| $\backslash\mathrm{norm}\{1\}$ | $\ 1\ $         | $\backslash\mathrm{supn}$    | $\supsetneq$       |
| $\backslash\mathrm{N}$         | $\mathbb{N}$    | $\backslash\mathrm{es}$      | $\emptyset$        |
| $\backslash\mathrm{C}$         | $\mathbb{C}$    | $\backslash\mathrm{sm}$      | $\backslash$       |
| $\backslash\mathrm{R}$         | $\mathbb{R}$    | $\backslash\mathrm{ps}$      | $\mathcal{P}$      |
| $\backslash\mathrm{Q}$         | $\mathbb{Q}$    | $\backslash\mathrm{Un}$      | $\cup$             |
| $\backslash\mathrm{Z}$         | $\mathbb{Z}$    | $\backslash\mathrm{In}$      | $\cap$             |
| $\backslash\mathrm{F}$         | $\mathbb{F}$    | $\backslash\mathrm{Du}$      | $\sqcup$           |
| $\backslash\mathrm{nsg}$       | $\leq$          | $\backslash\mathrm{Cp}$      | $\coprod$          |
| $\backslash\mathrm{ot}$        | $\otimes$       | $\backslash\mathrm{cp}$      | $\amalg$           |
| $\backslash\mathrm{op}$        | $\oplus$        | $\backslash\mathrm{sgn}$     | $\mathrm{sgn}$     |
| $\backslash\mathrm{Ps}\{1\}$   | $\mathbb{P}^1$  | $\backslash\mathrm{sdp}$     | $\rtimes$          |
| $\backslash\mathrm{CP}\{1\}$   | $\mathbb{CP}^1$ | $\backslash\mathrm{Spec}$    | $\mathrm{Spec}$    |
| $\backslash\mathrm{RP}\{1\}$   | $\mathbb{RP}^1$ | $\backslash\mathrm{Syl}$     | $\mathrm{Syl}$     |
| $\backslash\mathrm{proj}$      | $\mathrm{proj}$ | $\backslash\mathrm{Sym}$     | $\mathrm{Sym}$     |
| $\backslash\mathrm{po}$        | $\prec$         | $\backslash\mathrm{GL}$      | $\mathrm{GL}$      |
| $\backslash\mathrm{poe}$       | $\preceq$       | $\backslash\mathrm{SL}$      | $\mathrm{SL}$      |
| $\backslash\mathrm{ran}$       | $\mathrm{ran}$  | $\backslash\mathrm{Mod}$     | $\mathrm{Mod}$     |
| $\backslash\mathrm{sub}$       | $\subset$       | $\backslash\mathrm{Sg}$      | $\mathfrak{S}$     |
| $\backslash\mathrm{sube}$      | $\subseteq$     | $\backslash\mathrm{Ag}$      | $\mathfrak{A}$     |
| $\backslash\mathrm{sups}$      | $\supset$       | $\backslash\mathrm{uni}$     | $\exists!$         |
| $\backslash\mathrm{supe}$      | $\supseteq$     | $\backslash\mathrm{tp}\{1\}$ | $1^\top$           |
| $\backslash\mathrm{nsb}$       | $\not\subset$   | $\backslash\mathrm{T}$       | $\mathcal{T}$      |
| $\backslash\mathrm{nsup}$      | $\not\supset$   | $\backslash\mathrm{tri}$     | $\triangle$        |
| $\backslash\mathrm{nsube}$     | $\not\subseteq$ | $\backslash\mathrm{td}$      | $\mathrm{tradg}$   |
| $\backslash\mathrm{nsupe}$     | $\not\supseteq$ | $\backslash\mathrm{wb}\{1\}$ | $\bar{\mathrm{I}}$ |
| $\backslash\mathrm{subn}$      | $\subsetneq$    |                              |                    |

### 13 Acknowledgement

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