

Demo of My L^AT_EX 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}
```

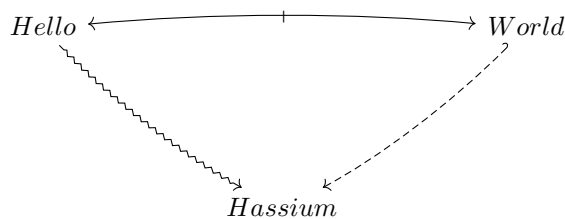
The outputs are *font 1* and *font 2*.

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] \\
    & \&\& Hassium
  \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:

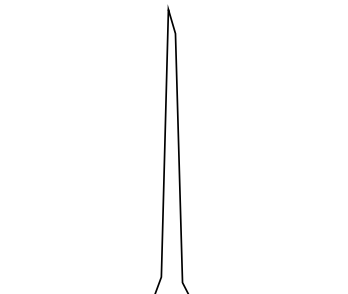
```
\begin{reviewmode}
  \begin{proof}
    The proof is trivial.
  \end{proof}
\end{reviewmode}
```

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	$\backslash dom$	dom
$\backslash da$	\downarrow	$\backslash cod$	cod
$\backslash Ra$	\Rightarrow	$\backslash colim$	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	$\backslash pa$	∂
$\backslash mt$	\mapsto	$\backslash d$	d
$\backslash rat$	\rightharpoonup	$\backslash Ext$	Ext
$\backslash lat$	\leftarrow	$\backslash Tor$	Tor
$\backslash thra$	\rightarrow	$\backslash fl\{1\}$	$[1]$
$\backslash thla$	\leftarrow	$\backslash al$	α
$\backslash bij$	$\xrightarrow{\sim}$	$\backslash be$	β
$\backslash Ann$	Ann	$\backslash ga$	γ
$\backslash A\{1\}$	A^1	$\backslash de$	δ
$\backslash ab$	ab	$\backslash ep$	ϵ
$\backslash can$	can	$\backslash si$	σ
$\backslash Can$	Can	$\backslash la$	λ
$\backslash Rel$	Rel	$\backslash ka$	κ
$\backslash Cycl$	Cycl	$\backslash om$	ω
$\backslash SCan$	SCan	$\backslash Ga$	Γ
$\backslash Cay$	Cay	$\backslash De$	Δ
$\backslash bb\{H\}$	\mathbb{H}	$\backslash Si$	Σ
$\backslash ca\{H\}$	\mathcal{H}	$\backslash LA$	Λ
$\backslash fr\{H\}$	\mathfrak{H}	$\backslash Om$	Ω
$\backslash scr\{H\}$	\mathscr{H}	$\backslash vt$	ϑ
$\backslash comp$	\circ	$\backslash vp$	φ
$\backslash iso$	\approx	$\backslash ve$	ε
$\backslash niso$	$\not\approx$	$\backslash acts$	\curvearrowright
$\backslash Mor$	Mor	$\backslash Gal$	Gal
$\backslash Aut$	Aut	$\backslash cyc\{1\}$	$\langle 1 \rangle$
$\backslash End$	End	$\backslash Ht$	ht
$\backslash Hom$	Hom	$\backslash Hol$	Hol
$\backslash Inn$	Inn	$\backslash id$	id
$\backslash Out$	Out	$\backslash im$	im
$\backslash Iso$	Iso	$\backslash inv\{1\}$	1^{-1}
$\backslash Ob$	Ob	$x \bmod y$	$x \bmod y$

$\backslash\mathrm{norm}\{1\}$	$\ 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	$\backslash\mathrm{sgn}$	sgn
$\backslash\mathrm{Ps}\{1\}$	\mathbb{P}^1	$\backslash\mathrm{sdp}$	\rtimes
$\backslash\mathrm{CP}\{1\}$	\mathbb{CP}^1	$\backslash\mathrm{Spec}$	Spec
$\backslash\mathrm{RP}\{1\}$	\mathbb{RP}^1	$\backslash\mathrm{Syl}$	Syl
$\backslash\mathrm{proj}$	proj	$\backslash\mathrm{Sym}$	Sym
$\backslash\mathrm{po}$	\prec	$\backslash\mathrm{GL}$	GL
$\backslash\mathrm{poe}$	\preceq	$\backslash\mathrm{SL}$	SL
$\backslash\mathrm{ran}$	ran	$\backslash\mathrm{Mod}$	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
$\backslash\mathrm{nsup}$	$\not\supseteq$	$\backslash\mathrm{T}$	\mathcal{T}
$\backslash\mathrm{nsup}$	$\not\supset$	$\backslash\mathrm{tri}$	\triangle
$\backslash\mathrm{nsube}$	$\not\subseteq$	$\backslash\mathrm{td}$	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.