

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,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,transparent}
\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.

```
\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{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

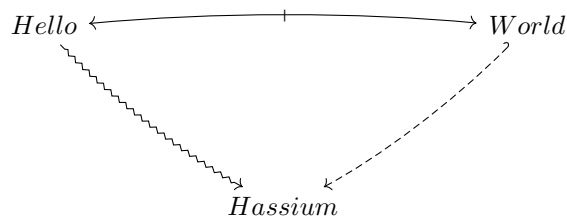
Quiver is done by varkor and AndréC, check their github for more information. I include quiver to draw curve arrows in a commutative diagram. To draw a diagram with quiver, check this website. An example is given below:

```

% chktex-file 15 % the three lines enables useless warnings
% chktex-file 17
% chktex-file 18
\begin{center}
  \begin{tikzcd}
    Hello & \&\&\& World & \\\
    & \\\
    & \\\
    & \&\& 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 | ε |
| \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 | \hookleftarrow |
| \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 | \mapsto |
| \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 | α | \backslash sube | \subseteq |
| \backslash be | β | \backslash supe | \supseteq |
| \backslash ga | γ | \backslash nsup | $\not\subset$ |
| \backslash de | δ | \backslash nsup | $\not\supseteq$ |
| \backslash ep | ϵ | \backslash nsube | $\not\subseteq$ |
| \backslash si | σ | \backslash nsupe | $\not\supseteq$ |
| \backslash la | λ | \backslash subn | \subsetneq |
| \backslash ka | κ | \backslash supn | \supsetneq |
| \backslash om | ω | \backslash es | \emptyset |
| \backslash vp | φ | \backslash sm | \backslash |
| \backslash vt | ϑ | \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> | Spec |
| <code>\Cp</code> | \coprod | <code>\Syl</code> | 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> | Mor |
| <code>\Span</code> | span | <code>\Aut</code> | Aut |
| <code>\sgn</code> | sgn | <code>\End</code> | End |
| <code>\nsg</code> | \trianglelefteq | <code>\Hom</code> | Hom |
| <code>\defa</code> | \coloneqq | <code>\Inn</code> | Inn |
| <code>\sdp</code> | \rtimes | <code>\Out</code> | Out |
| <code>\inv{f}</code> | f^{-1} | <code>\Iso</code> | Iso |
| <code>1\mod 2</code> | $1 \bmod 2$ | <code>\Ob</code> | Ob |
| <code>\Cl</code> | Cl | <code>\cop{C}</code> | \mathbb{C}^{op} |
| <code>\Hol</code> | Hol | <code>\tri</code> | \triangle |
| <code>\comp</code> | \circ | <code>\pa</code> | ∂ |
| <code>\Gal</code> | Gal | <code>\Ann</code> | Ann |
| <code>\card{S}</code> | $ S $ | <code>\dom</code> | dom |
| <code>\im</code> | im | <code>\cod</code> | cod |

12 Acknowledgement

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