

Demo of Hassium Style

Hassium

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1 Packages and General Setup

This style contains the following packages:

```
\usepackage[T1]{fontenc}
\usepackage[hidelinks]{hyperref}
\usepackage[explicit]{titlesec}
\usepackage[utf8]{inputenc}
\usepackage{amsmath,amsthm,amssymb,amsfonts,mathrsfs,mathtools,nicematrix,chgcntr,
centernot,ytableau,tikz-cd}
\usepackage{textcomp,tocloft,environ,setspace,geometry,enumerate,enumitem,blindtext,
multicol,xcolor,fancyhdr,calligra,graphicx,wrapfig,pgfplots,mdframed,tabularx,lipsum,
comment,csquotes}
\usepackage{chemfig}
```

How to insert it?

```
\documentclass{article} % This style only has commands on \section
\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 as follows:

```
\begin{document}
  \def\htitle{Your Title} % replace ‘‘Your Title’’ with the title you want
  \def\hauthor{Your Name} % replace ‘‘Your Name’’ with the author name you want
  \hsetup % given the parameters, this should setup the title
\end{document}
```

You can setup the table of contents by the code:

```
\begin{document}
  \htoc
\end{document}
```

This will automatically generate a table of contents when you add a section to the document.

3 Mainmatter of the Document

Every page in the mainmatter has a header, which contains author name, title, and page number. Use the following code to setup:

```
\begin{document}
  \hmain
\end{document}
```

4 An Example: This Demo

This demo offers an easy example of how to use the style. Here is my code for this demo:

```
\documentclass[10pt]{article} % The font size does not matter
\input{hassium.tex}
\begin{document}
  \def\htitle{Demo of Hassium Style}
  \def\hauthor{Hassium}
  \hsetup\
  \htoc\
  \hmain\
\end{document}
```

5 Setup in Geometry

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

```
\geometry{letterpaper, margin=0.75in}
\setstretch{1.25} % spacing
\setlength{\headheight}{13pt}
```

6 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.

7 Darkmode

Darkmode command changes the background color to black and the text to white. The normal mode is used to end the darkmode. Use the commands by:

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

8 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}
```

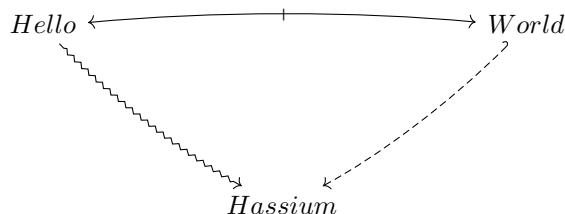
The outputs are *font 1* and *font 2*.

9 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:



10 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}
```

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.

11 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}
```

12 Simple Commands in Math Mode

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

| | | | |
|--------------------|-----------------|------------------|---------------|
| $\backslash bs$ | \backslash | $\backslash Cay$ | Cay |
| $\backslash N$ | \mathbb{N} | $\backslash uni$ | $\exists !$ |
| $\backslash Z$ | \mathbb{Z} | $\backslash al$ | α |
| $\backslash Q$ | \mathbb{Q} | $\backslash be$ | β |
| $\backslash R$ | \mathbb{R} | $\backslash ga$ | γ |
| $\backslash C$ | \mathbb{C} | $\backslash de$ | δ |
| $\backslash bb{H}$ | \mathbb{H} | $\backslash ep$ | ϵ |
| $\backslash ca{H}$ | \mathcal{H} | $\backslash si$ | σ |
| $\backslash fr{H}$ | \mathfrak{H} | $\backslash la$ | λ |
| $\backslash T$ | \mathcal{T} | $\backslash ka$ | κ |
| $\backslash Pn{1}$ | \mathbb{P}^1 | $\backslash om$ | ω |
| $\backslash CP{1}$ | \mathbb{CP}^1 | $\backslash vp$ | φ |
| $\backslash RP{1}$ | \mathbb{RP}^1 | $\backslash vt$ | ϑ |
| $\backslash Sym$ | Sym | $\backslash ve$ | ε |
| $\backslash GL$ | GL | $\backslash ua$ | \uparrow |
| $\backslash SL$ | SL | $\backslash da$ | \downarrow |
| $\backslash Mod$ | Mod | $\backslash Ra$ | \Rightarrow |
| $\backslash Sg$ | \mathfrak{S} | $\backslash La$ | \Leftarrow |
| $\backslash Ag$ | \mathfrak{A} | $\backslash Ua$ | \Uparrow |

| | | | |
|---------------------|----------------------|-----------------------|---------------------|
| <code>\Da</code> | \Downarrow | <code>\Span</code> | span |
| <code>\nRa</code> | \nrightarrow | <code>\sgn</code> | sgn |
| <code>\nLa</code> | \nleftarrow | <code>\nsg</code> | \trianglelefteq |
| <code>\hra</code> | \hookrightarrow | <code>\defa</code> | \coloneqq |
| <code>\hla</code> | \hookleftarrow | <code>\sdp</code> | \rtimes |
| <code>\lt</code> | \rightsquigarrow | <code>\inv{f}</code> | f^{-1} |
| <code>\mt</code> | \mapsto | <code>1\mod 2</code> | $1 \bmod 2$ |
| <code>\rat</code> | \rightharpoonup | <code>\Cl</code> | Cl |
| <code>\lat</code> | \leftharpoonup | <code>\Hol</code> | Hol |
| <code>\thra</code> | \rightarrowtail | <code>\comp</code> | \circ |
| <code>\thla</code> | \leftarrowtail | <code>\Gal</code> | Gal |
| <code>\bij</code> | $\xrightarrow{\sim}$ | <code>\card{S}</code> | $ S $ |
| <code>\wb{A}</code> | \overline{A} | <code>\im</code> | im |
| <code>\id</code> | id | <code>\norm{M}</code> | $\ M\ $ |
| <code>\sub</code> | \subset | <code>\po</code> | \preceq |
| <code>\sube</code> | \subseteq | <code>\cyc{g}</code> | $\langle g \rangle$ |
| <code>\supe</code> | \supseteq | <code>\Spec</code> | Spec |
| <code>\nsub</code> | $\not\subset$ | <code>\Syl</code> | Syl |
| <code>\nsup</code> | $\not\supset$ | <code>\iso</code> | \approx |
| <code>\nsube</code> | $\not\subseteq$ | <code>\niso</code> | $\not\approx$ |
| <code>\nsupe</code> | $\not\supseteq$ | <code>\Mor</code> | Mor |
| <code>\subn</code> | \subsetneq | <code>\Aut</code> | Aut |
| <code>\supn</code> | \supsetneq | <code>\End</code> | End |
| <code>\es</code> | \emptyset | <code>\Hom</code> | Hom |
| <code>\sm</code> | \backslash | <code>\Inn</code> | Inn |
| <code>\ps</code> | \mathcal{P} | <code>\Out</code> | Out |
| <code>\Un</code> | \bigcup | <code>\Iso</code> | Iso |
| <code>\In</code> | \bigcap | <code>\Ob</code> | Ob |
| <code>\Du</code> | \bigsqcup | <code>\cop{C}</code> | C^{op} |
| <code>\cp</code> | \amalg | <code>\tri</code> | \triangle |
| <code>\Cp</code> | \coprod | <code>\pa</code> | ∂ |
| <code>\ot</code> | \otimes | <code>\hb</code> | \hbar |
| <code>\op</code> | \oplus | <code>\Ann</code> | Ann |
| <code>\acts</code> | \curvearrowright | | |

13 Acknowledgement

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