

# 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,enviro,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}
```

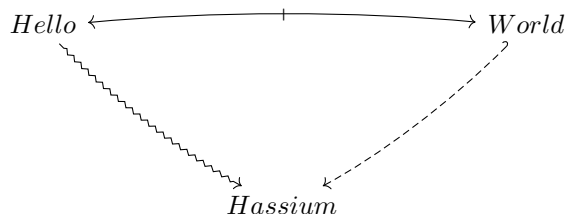
The outputs are *font 1* and *font 2*.

## 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 \\
    & \arrowleft & & \\
    & \arrowright & & \\
    & & Hassium & \\
    & \arrowright["\shortmid" marking, curve={height=-6pt}, tail reversed, from=1-1, to=1-5] & & \\
    & \arrowleft[curve={height=6pt}, squiggly, from=1-1, to=4-3] & & \\
    & \arrowright[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
$\backslash N$	$\mathbb{N}$	$\backslash uni$	$\exists !$
$\backslash Z$	$\mathbb{Z}$	$\backslash al$	$\alpha$
$\backslash Q$	$\mathbb{Q}$	$\backslash be$	$\beta$
$\backslash R$	$\mathbb{R}$	$\backslash ga$	$\gamma$
$\backslash C$	$\mathbb{C}$	$\backslash de$	$\delta$
$\backslash bb{H}$	$\mathbb{H}$	$\backslash ep$	$\epsilon$
$\backslash ca{H}$	$\mathcal{H}$	$\backslash si$	$\sigma$
$\backslash fr{H}$	$\mathfrak{H}$	$\backslash la$	$\lambda$
$\backslash T$	$\mathcal{T}$	$\backslash ka$	$\kappa$
$\backslash Pn{1}$	$\mathbb{P}^1$	$\backslash om$	$\omega$
$\backslash CP{1}$	$\mathbb{CP}^1$	$\backslash vp$	$\varphi$
$\backslash RP{1}$	$\mathbb{RP}^1$	$\backslash vt$	$\vartheta$
$\backslash Sym$	Sym	$\backslash ve$	$\varepsilon$
$\backslash GL$	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>	$\text{span}$
<code>\nRa</code>	$\nrightarrow$	<code>\sgn</code>	$\text{sgn}$
<code>\nLa</code>	$\nleftarrow$	<code>\nsg</code>	$\trianglelefteq$
<code>\hra</code>	$\hookrightarrow$	<code>\defa</code>	$\coloneqq$
<code>\hla</code>	$\leftarrow$	<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>	$\text{Cl}$
<code>\lat</code>	$\leftarrow$	<code>\Hol</code>	$\text{Hol}$
<code>\thra</code>	$\rightarrow$	<code>\comp</code>	$\circ$
<code>\thla</code>	$\leftarrow$	<code>\Gal</code>	$\text{Gal}$
<code>\bij</code>	$\xrightarrow{\sim}$	<code>\card{S}</code>	$ S $
<code>\wb{A}</code>	$\overline{A}$	<code>\im</code>	$\text{im}$
<code>\id</code>	<code>id</code>	<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>	$\text{Spec}$
<code>\nsub</code>	$\not\subset$	<code>\Syl</code>	$\text{Syl}$
<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>	$\text{Mor}$
<code>\subn</code>	$\subsetneq$	<code>\Aut</code>	$\text{Aut}$
<code>\supn</code>	$\supsetneq$	<code>\End</code>	$\text{End}$
<code>\es</code>	$\emptyset$	<code>\Hom</code>	$\text{Hom}$
<code>\sm</code>	$\backslash$	<code>\Inn</code>	$\text{Inn}$
<code>\ps</code>	$\mathcal{P}$	<code>\Out</code>	$\text{Out}$
<code>\Un</code>	$\bigcup$	<code>\Iso</code>	$\text{Iso}$
<code>\In</code>	$\bigcap$	<code>\Ob</code>	$\text{Ob}$
<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>	$\partial$
<code>\ot</code>	$\otimes$	<code>\hb</code>	$\hbar$
<code>\op</code>	$\oplus$	<code>\Ann</code>	$\text{Ann}$
<code>\acts</code>	$\curvearrowright$		

## 13 Acknowledgement

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