

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,chngecntr,
centernot,ytableau,tikz-cd}
\usepackage{textcomp,tocloft,envron,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}
```

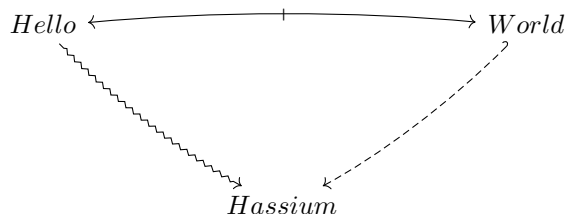
The outputs are *font 1* and *font 2*.

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

13 Acknowledgement

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