Unicode declarations for LaTeX documents.

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Contents

1 About this file

In order to write LaTeX documents using unicode in the source code, we must often tell LaTeX what we want the unicode characters to be rendered as.

There are at least two ways to inform LaTeX of unicode character translations;

- `\DeclareUnicodeCharacter`; this command does not work with XeLaTeX or LuaLaTeX, which I use.
- `\newunicodechar`; this command is provided by the newunicodechar package, which may not be pre-installed for all LaTeX users.

This collection uses the second.

1.1 Usage

This file generates (via Org Babel tangling) the file `unicode.sty`.

To use it, either place it in the same directory as your `.tex` file, and require it via `\usepackage{unicode}`.

Alternatively, place it in your `texmf` directory to allow global usage on your system. That directory is commonly located at the following locations on various OS's.

- Linux
  - `~/texmf/tex/latex/local/`
- Mac OS X
  - `/Users/<user name>/Library/texmf/tex/latex/local/`
- Windows 10 (and miktex)
  - `C:\Users\<user name>\Appdata\Local\MikTex\<number>\tex\latex\local\`
- Windows Vista/7
  - `C:\Users\<user name>\texmf\tex\latex\local\`

- Windows XP
  - `C:\Documents and Settings\<user name>\texmf\tex\latex\local\`

By default, we assume the standard `pdflatex` typesetting engine is used, if you are using XeLaTeX or LuaLaTeX, then simply declare:

```
\pdflatexfalse
```

1.2 Required LaTeX packages

Of course we require the `newunicodechar` package to use that command.

```
\usepackage{newunicodechar}

\usepackage{ifxetex, ifluatex} % Also used in agda.sty: xifthen

% https://tex.stackexchange.com/questions/47576/combining-ifxetex-and-ifluatex-with-th
\newif\ifpdflatex
\ifxetex
  \pdflatexfalse
\else
  \ifluatex
    \pdflatexfalse
  \else
    \pdflatextrue
  \fi
\fi

%\newif\ifpdflatex
%\pdflatextrue
%% To use other typesetting engines, declare the following:
%% \pdflatexfalse
```

The unicode-math package "provides a complete implementation of unicode maths for XeLaTeX and LuaLaTeX".

```
\ifpdflatex
  \usepackage{pifont}
  \usepackage{stmaryrd}
  \usepackage{amsmath, amssymb, amsthm, latexsym, amscd, enumerate, bbm, etex, nicefra
\else
  \usepackage{unicode-math}
\fi
```

1.3 Contributing to this document

This document is written in Emacs using Org mode. While the exported PDF version, etc., show a collection of LaTeX source blocks, these are in fact generated by an Emacs Lisp script below.

That means that contributions to this document should modify the Emacs Lisp script, not `unicode.sty` or the LaTeX source blocks themselves.

1.4 The Emacs Lisp script

In this document, several lists of unicode character, LaTeX translation pairs are declared, and then "wrapped" into `latex` source blocks, using this function to map the pairs into `newunicodechar` declarations.

```
generate-newunicodechars
```

2 𝔹lackboard, 𝒞alligraphic, and Bold-font

These lists are most likely complete, unless I have missed some characters aside from Latin letters, Greek letters and Arabic numerals which should be included.

For Agda users, the unicode symbols may be entered using the following sequences:

Blackboard	`\b`x
Calligraphic	`\MC`x
Bold-font	`\MI`x

2.1 Blackboard

2.1.1 Lowercase Latin

```
\ifpdflatex
  \newunicodechar{𝕒}{\ensuremath{\mathbbm{a}}}
\else
  \newunicodechar{𝕒}{\ensuremath{\mathbb{a}}}
\fi
\ifpdflatex
  \newunicodechar{𝕓}{\ensuremath{\mathbbm{b}}}
\else
  \newunicodechar{𝕓}{\ensuremath{\mathbb{b}}}
\fi
```

```
\ifpdflatex
  \newunicodechar{𝕔}{\ensuremath{\mathbbm{c}}}
\else
  \newunicodechar{𝕔}{\ensuremath{\mathbb{c}}}
\fi
\ifpdflatex
  \newunicodechar{𝕕}{\ensuremath{\mathbbm{d}}}
\else
  \newunicodechar{𝕕}{\ensuremath{\mathbb{d}}}
\fi
\ifpdflatex
  \newunicodechar{𝕖}{\ensuremath{\mathbbm{e}}}
\else
  \newunicodechar{𝕖}{\ensuremath{\mathbb{e}}}
\fi
\ifpdflatex
  \newunicodechar{𝕗}{\ensuremath{\mathbbm{f}}}
\else
  \newunicodechar{𝕗}{\ensuremath{\mathbb{f}}}
\fi
\ifpdflatex
  \newunicodechar{𝕘}{\ensuremath{\mathbbm{g}}}
\else
  \newunicodechar{𝕘}{\ensuremath{\mathbb{g}}}
\fi
\ifpdflatex
  \newunicodechar{𝕙}{\ensuremath{\mathbbm{h}}}
\else
  \newunicodechar{𝕙}{\ensuremath{\mathbb{h}}}
\fi
\ifpdflatex
  \newunicodechar{𝕚}{\ensuremath{\mathbbm{i}}}
\else
  \newunicodechar{𝕚}{\ensuremath{\mathbb{i}}}
\fi
\ifpdflatex
  \newunicodechar{𝕛}{\ensuremath{\mathbbm{j}}}
\else
  \newunicodechar{𝕛}{\ensuremath{\mathbb{j}}}
\fi
```

```
\ifpdflatex
  \newunicodechar{𝕜}{\ensuremath{\mathbbm{k}}}
\else
  \newunicodechar{𝕜}{\ensuremath{\mathbb{k}}}
\fi
\ifpdflatex
  \newunicodechar{𝕝}{\ensuremath{\mathbbm{l}}}
\else
  \newunicodechar{𝕝}{\ensuremath{\mathbb{l}}}
\fi
\ifpdflatex
  \newunicodechar{𝕞}{\ensuremath{\mathbbm{m}}}
\else
  \newunicodechar{𝕞}{\ensuremath{\mathbb{m}}}
\fi
\ifpdflatex
  \newunicodechar{𝕟}{\ensuremath{\mathbbm{n}}}
\else
  \newunicodechar{𝕟}{\ensuremath{\mathbb{n}}}
\fi
\ifpdflatex
  \newunicodechar{𝕠}{\ensuremath{\mathbbm{o}}}
\else
  \newunicodechar{𝕠}{\ensuremath{\mathbb{o}}}
\fi
\ifpdflatex
  \newunicodechar{𝕡}{\ensuremath{\mathbbm{p}}}
\else
  \newunicodechar{𝕡}{\ensuremath{\mathbb{p}}}
\fi
\ifpdflatex
  \newunicodechar{𝕢}{\ensuremath{\mathbbm{q}}}
\else
  \newunicodechar{𝕢}{\ensuremath{\mathbb{q}}}
\fi
\ifpdflatex
  \newunicodechar{𝕣}{\ensuremath{\mathbbm{r}}}
\else
  \newunicodechar{𝕣}{\ensuremath{\mathbb{r}}}
\fi
```

```
\ifpdflatex
  \newunicodechar{𝕤}{\ensuremath{\mathbbm{s}}}
\else
  \newunicodechar{𝕤}{\ensuremath{\mathbb{s}}}
\fi
\ifpdflatex
  \newunicodechar{𝕥}{\ensuremath{\mathbbm{t}}}
\else
  \newunicodechar{𝕥}{\ensuremath{\mathbb{t}}}
\fi
\ifpdflatex
  \newunicodechar{𝕦}{\ensuremath{\mathbbm{u}}}
\else
  \newunicodechar{𝕦}{\ensuremath{\mathbb{u}}}
\fi
\ifpdflatex
  \newunicodechar{𝕧}{\ensuremath{\mathbbm{v}}}
\else
  \newunicodechar{𝕧}{\ensuremath{\mathbb{v}}}
\fi
\ifpdflatex
  \newunicodechar{𝕨}{\ensuremath{\mathbbm{w}}}
\else
  \newunicodechar{𝕨}{\ensuremath{\mathbb{w}}}
\fi
\ifpdflatex
  \newunicodechar{𝕩}{\ensuremath{\mathbbm{x}}}
\else
  \newunicodechar{𝕩}{\ensuremath{\mathbb{x}}}
\fi
\ifpdflatex
  \newunicodechar{𝕪}{\ensuremath{\mathbbm{y}}}
\else
  \newunicodechar{𝕪}{\ensuremath{\mathbb{y}}}
\fi
\ifpdflatex
  \newunicodechar{𝕫}{\ensuremath{\mathbbm{z}}}
\else
  \newunicodechar{𝕫}{\ensuremath{\mathbb{z}}}
\fi
```

2.1.2 Uppercase Latin

```
\newunicodechar{𝔸}{\ensuremath{\mathbb{A}}}
\newunicodechar{𝔹}{\ensuremath{\mathbb{B}}}
\newunicodechar{ℂ}{\ensuremath{\mathbb{C}}}
\newunicodechar{𝔻}{\ensuremath{\mathbb{D}}}
\newunicodechar{𝔼}{\ensuremath{\mathbb{E}}}
\newunicodechar{𝔽}{\ensuremath{\mathbb{F}}}
\newunicodechar{𝔾}{\ensuremath{\mathbb{G}}}
\newunicodechar{ℍ}{\ensuremath{\mathbb{H}}}
\newunicodechar{𝕀}{\ensuremath{\mathbb{I}}}
\newunicodechar{𝕁}{\ensuremath{\mathbb{J}}}
\newunicodechar{𝕂}{\ensuremath{\mathbb{K}}}
\newunicodechar{𝕃}{\ensuremath{\mathbb{L}}}
\newunicodechar{𝕄}{\ensuremath{\mathbb{M}}}
\newunicodechar{ℕ}{\ensuremath{\mathbb{N}}}
\newunicodechar{𝕆}{\ensuremath{\mathbb{O}}}
\newunicodechar{ℙ}{\ensuremath{\mathbb{P}}}
\newunicodechar{ℚ}{\ensuremath{\mathbb{Q}}}
\newunicodechar{ℝ}{\ensuremath{\mathbb{R}}}
\newunicodechar{𝕊}{\ensuremath{\mathbb{S}}}
\newunicodechar{𝕋}{\ensuremath{\mathbb{T}}}
\newunicodechar{𝕌}{\ensuremath{\mathbb{U}}}
\newunicodechar{𝕍}{\ensuremath{\mathbb{V}}}
\newunicodechar{𝕎}{\ensuremath{\mathbb{W}}}
\newunicodechar{𝕏}{\ensuremath{\mathbb{X}}}
\newunicodechar{𝕐}{\ensuremath{\mathbb{Y}}}
\newunicodechar{ℤ}{\ensuremath{\mathbb{Z}}}
```

2.1.3 Arabic Numerals

```
% For double stroke digits with pdflatex
\usepackage[bbgreekl]{mathbbol}
\DeclareSymbolFontAlphabet{\mathbbl}{bbold}

\ifpdflatex
  \newunicodechar{𝟙}{\ensuremath{\mathbbl{1}}}
\else
  \newunicodechar{𝟙}{\ensuremath{\mathbb{1}}}
\fi
\ifpdflatex
```

```
  \newunicodechar{2}{\ensuremath{\mathbbl{2}}}
\else
  \newunicodechar{2}{\ensuremath{\mathbb{2}}}
\fi
\ifpdflatex
  \newunicodechar{3}{\ensuremath{\mathbbl{3}}}
\else
  \newunicodechar{3}{\ensuremath{\mathbb{3}}}
\fi
\ifpdflatex
  \newunicodechar{4}{\ensuremath{\mathbbl{4}}}
\else
  \newunicodechar{4}{\ensuremath{\mathbb{4}}}
\fi
\ifpdflatex
  \newunicodechar{5}{\ensuremath{\mathbbl{5}}}
\else
  \newunicodechar{5}{\ensuremath{\mathbb{5}}}
\fi
\ifpdflatex
  \newunicodechar{6}{\ensuremath{\mathbbl{6}}}
\else
  \newunicodechar{6}{\ensuremath{\mathbb{6}}}
\fi
\ifpdflatex
  \newunicodechar{7}{\ensuremath{\mathbbl{7}}}
\else
  \newunicodechar{7}{\ensuremath{\mathbb{7}}}
\fi
\ifpdflatex
  \newunicodechar{8}{\ensuremath{\mathbbl{8}}}
\else
  \newunicodechar{8}{\ensuremath{\mathbb{8}}}
\fi
\ifpdflatex
  \newunicodechar{9}{\ensuremath{\mathbbl{9}}}
\else
  \newunicodechar{9}{\ensuremath{\mathbb{9}}}
\fi
\ifpdflatex
```

```
  \newunicodechar{𝕆}{\ensuremath{\mathbbl{O}}}
\else
  \newunicodechar{𝕆}{\ensuremath{\mathbb{O}}}
\fi
```

2.1.4 Greek

There are unfortunately not many included in Unicode.

```
\ifpdflatex
  \newunicodechar{$TODO$}{\ensuremath{TODO}}
\else
  \newunicodechar{$TODO$}{\ensuremath{\mathbb{\Gamma}}}
\fi
\ifpdflatex
  \newunicodechar{$TODO$}{\ensuremath{TODO}}
\else
  \newunicodechar{$TODO$}{\ensuremath{\mathbb{\gamma}}}
\fi
\ifpdflatex
  \newunicodechar{$TODO$}{\ensuremath{TODO}}
\else
  \newunicodechar{$TODO$}{\ensuremath{\mathbb{\Pi}}}
\fi
\ifpdflatex
  \newunicodechar{$TODO$}{\ensuremath{TODO}}
\else
  \newunicodechar{$TODO$}{\ensuremath{\mathbb{\pi}}}
\fi
\ifpdflatex
  \newunicodechar{$TODO$}{\ensuremath{TODO}}
\else
  \newunicodechar{$TODO$}{\ensuremath{\mathbb{\Sum}}}
\fi
```

2.2 Calligraphic

2.2.1 Lowercase Latin

```
%-------------------------------------------------
% Uppercase latin
```

```
%-------------------------------------------------

\ifpdflatex
  \newunicodechar{a}{\ensuremath{a}}
\else
  \newunicodechar{a}{\ensuremath{\mathcal{a}}}
\fi
\ifpdflatex
  \newunicodechar{b}{\ensuremath{b}}
\else
  \newunicodechar{b}{\ensuremath{\mathcal{b}}}
\fi
\ifpdflatex
  \newunicodechar{c}{\ensuremath{c}}
\else
  \newunicodechar{c}{\ensuremath{\mathcal{c}}}
\fi
\ifpdflatex
  \newunicodechar{d}{\ensuremath{d}}
\else
  \newunicodechar{d}{\ensuremath{\mathcal{d}}}
\fi
\ifpdflatex
  \newunicodechar{e}{\ensuremath{e}}
\else
  \newunicodechar{e}{\ensuremath{\mathcal{e}}}
\fi
\ifpdflatex
  \newunicodechar{f}{\ensuremath{f}}
\else
  \newunicodechar{f}{\ensuremath{\mathcal{f}}}
\fi
\ifpdflatex
  \newunicodechar{g}{\ensuremath{g}}
\else
  \newunicodechar{g}{\ensuremath{\mathcal{g}}}
\fi
\ifpdflatex
  \newunicodechar{h}{\ensuremath{h}}
\else
```

```
  \newunicodechar{h}{\ensuremath{\mathcal{h}}}
\fi
\ifpdflatex
  \newunicodechar{i}{\ensuremath{i}}
\else
  \newunicodechar{i}{\ensuremath{\mathcal{i}}}
\fi
\ifpdflatex
  \newunicodechar{j}{\ensuremath{j}}
\else
  \newunicodechar{j}{\ensuremath{\mathcal{j}}}
\fi
\ifpdflatex
  \newunicodechar{j}{\ensuremath{j}}
\else
  \newunicodechar{j}{\ensuremath{\mathcal{k}}}
\fi
\ifpdflatex
  \newunicodechar{l}{\ensuremath{l}}
\else
  \newunicodechar{l}{\ensuremath{\mathcal{l}}}
\fi
\ifpdflatex
  \newunicodechar{m}{\ensuremath{m}}
\else
  \newunicodechar{m}{\ensuremath{\mathcal{m}}}
\fi
\ifpdflatex
  \newunicodechar{n}{\ensuremath{n}}
\else
  \newunicodechar{n}{\ensuremath{\mathcal{n}}}
\fi
\ifpdflatex
  \newunicodechar{o}{\ensuremath{o}}
\else
  \newunicodechar{o}{\ensuremath{\mathcal{o}}}
\fi
\ifpdflatex
  \newunicodechar{p}{\ensuremath{p}}
\else
```

```
  \newunicodechar{𝑝}{\ensuremath{\mathcal{p}}}
\fi
\ifpdflatex
  \newunicodechar{𝑞}{\ensuremath{q}}
\else
  \newunicodechar{𝑞}{\ensuremath{\mathcal{q}}}
\fi
\ifpdflatex
  \newunicodechar{𝑟}{\ensuremath{r}}
\else
  \newunicodechar{𝑟}{\ensuremath{\mathcal{r}}}
\fi
\ifpdflatex
  \newunicodechar{𝑠}{\ensuremath{s}}
\else
  \newunicodechar{𝑠}{\ensuremath{\mathcal{s}}}
\fi
\ifpdflatex
  \newunicodechar{𝑡}{\ensuremath{t}}
\else
  \newunicodechar{𝑡}{\ensuremath{\mathcal{t}}}
\fi
\ifpdflatex
  \newunicodechar{𝑢}{\ensuremath{u}}
\else
  \newunicodechar{𝑢}{\ensuremath{\mathcal{u}}}
\fi
\ifpdflatex
  \newunicodechar{𝑣}{\ensuremath{v}}
\else
  \newunicodechar{𝑣}{\ensuremath{\mathcal{v}}}
\fi
\ifpdflatex
  \newunicodechar{𝑤}{\ensuremath{w}}
\else
  \newunicodechar{𝑤}{\ensuremath{\mathcal{w}}}
\fi
\ifpdflatex
  \newunicodechar{𝑥}{\ensuremath{x}}
\else
```

```
  \newunicodechar{𝑥}{\ensuremath{\mathcal{x}}}
\fi
\ifpdflatex
  \newunicodechar{𝑦}{\ensuremath{y}}
\else
  \newunicodechar{𝑦}{\ensuremath{\mathcal{y}}}
\fi
\ifpdflatex
  \newunicodechar{𝑧}{\ensuremath{z}}
\else
  \newunicodechar{𝑧}{\ensuremath{\mathcal{z}}}
\fi
```

2.2.2 Uppercase Latin

```
%-------------------------------------------------
% Uppercase latin
%-------------------------------------------------

\newunicodechar{𝒜}{\ensuremath{\mathcal{A}}}
\newunicodechar{ℬ}{\ensuremath{\mathcal{B}}}
\newunicodechar{𝒞}{\ensuremath{\mathcal{C}}}
\newunicodechar{𝒟}{\ensuremath{\mathcal{D}}}
\newunicodechar{ℰ}{\ensuremath{\mathcal{E}}}
\newunicodechar{ℱ}{\ensuremath{\mathcal{F}}}
\newunicodechar{𝒢}{\ensuremath{\mathcal{G}}}
\newunicodechar{ℋ}{\ensuremath{\mathcal{H}}}
\newunicodechar{ℐ}{\ensuremath{\mathcal{I}}}
\newunicodechar{𝒥}{\ensuremath{\mathcal{J}}}
\newunicodechar{𝒦}{\ensuremath{\mathcal{K}}}
\newunicodechar{ℒ}{\ensuremath{\mathcal{L}}}
\newunicodechar{ℳ}{\ensuremath{\mathcal{M}}}
\newunicodechar{𝒩}{\ensuremath{\mathcal{N}}}
\newunicodechar{𝒪}{\ensuremath{\mathcal{O}}}
\newunicodechar{𝒫}{\ensuremath{\mathcal{P}}}
\newunicodechar{𝒬}{\ensuremath{\mathcal{Q}}}
\newunicodechar{ℛ}{\ensuremath{\mathcal{R}}}
\newunicodechar{𝒮}{\ensuremath{\mathcal{S}}}
\newunicodechar{𝒯}{\ensuremath{\mathcal{T}}}
\newunicodechar{𝒰}{\ensuremath{\mathcal{U}}}
```

```
\newunicodechar{𝒱}{\ensuremath{\mathcal{V}}}
\newunicodechar{𝒲}{\ensuremath{\mathcal{W}}}
\newunicodechar{𝒳}{\ensuremath{\mathcal{X}}}
\newunicodechar{𝒴}{\ensuremath{\mathcal{Y}}}
\newunicodechar{𝒵}{\ensuremath{\mathcal{Z}}}
```

2.3 Bold-font

2.3.1 Lowercase Latin

```
\newunicodechar{𝐚}{\ensuremath{\mathbf{a}}}
\newunicodechar{𝐛}{\ensuremath{\mathbf{b}}}
\newunicodechar{𝐜}{\ensuremath{\mathbf{c}}}
\newunicodechar{𝐝}{\ensuremath{\mathbf{d}}}
\newunicodechar{𝐞}{\ensuremath{\mathbf{e}}}
\newunicodechar{𝐟}{\ensuremath{\mathbf{f}}}
\newunicodechar{𝐠}{\ensuremath{\mathbf{g}}}
\newunicodechar{𝐡}{\ensuremath{\mathbf{h}}}
\newunicodechar{𝐢}{\ensuremath{\mathbf{i}}}
\newunicodechar{𝐣}{\ensuremath{\mathbf{j}}}
\newunicodechar{𝐥}{\ensuremath{\mathbf{k}}}
\newunicodechar{𝐥}{\ensuremath{\mathbf{l}}}
\newunicodechar{𝐦}{\ensuremath{\mathbf{m}}}
\newunicodechar{𝐧}{\ensuremath{\mathbf{n}}}
\newunicodechar{𝐨}{\ensuremath{\mathbf{o}}}
\newunicodechar{𝐩}{\ensuremath{\mathbf{p}}}
\newunicodechar{𝐪}{\ensuremath{\mathbf{q}}}
\newunicodechar{𝐫}{\ensuremath{\mathbf{r}}}
\newunicodechar{𝐬}{\ensuremath{\mathbf{s}}}
\newunicodechar{𝐭}{\ensuremath{\mathbf{t}}}
\newunicodechar{𝐮}{\ensuremath{\mathbf{u}}}
\newunicodechar{𝐯}{\ensuremath{\mathbf{v}}}
\newunicodechar{𝐰}{\ensuremath{\mathbf{w}}}
\newunicodechar{𝐱}{\ensuremath{\mathbf{x}}}
\newunicodechar{𝐲}{\ensuremath{\mathbf{y}}}
\newunicodechar{𝐳}{\ensuremath{\mathbf{z}}}
```

2.3.2 Uppercase Latin

```
\newunicodechar{𝐀}{\ensuremath{\mathbf{A}}}
\newunicodechar{𝐁}{\ensuremath{\mathbf{B}}}
```

```
\newunicodechar{C}{\ensuremath{\mathbf{C}}}
\newunicodechar{D}{\ensuremath{\mathbf{D}}}
\newunicodechar{E}{\ensuremath{\mathbf{E}}}
\newunicodechar{F}{\ensuremath{\mathbf{F}}}
\newunicodechar{G}{\ensuremath{\mathbf{G}}}
\newunicodechar{H}{\ensuremath{\mathbf{H}}}
\newunicodechar{I}{\ensuremath{\mathbf{I}}}
\newunicodechar{J}{\ensuremath{\mathbf{J}}}
\newunicodechar{K}{\ensuremath{\mathbf{K}}}
\newunicodechar{L}{\ensuremath{\mathbf{L}}}
\newunicodechar{M}{\ensuremath{\mathbf{M}}}
\newunicodechar{N}{\ensuremath{\mathbf{N}}}
\newunicodechar{O}{\ensuremath{\mathbf{O}}}
\newunicodechar{P}{\ensuremath{\mathbf{P}}}
\newunicodechar{Q}{\ensuremath{\mathbf{Q}}}
\newunicodechar{R}{\ensuremath{\mathbf{R}}}
\newunicodechar{S}{\ensuremath{\mathbf{S}}}
\newunicodechar{T}{\ensuremath{\mathbf{T}}}
\newunicodechar{U}{\ensuremath{\mathbf{U}}}
\newunicodechar{V}{\ensuremath{\mathbf{V}}}
\newunicodechar{W}{\ensuremath{\mathbf{W}}}
\newunicodechar{X}{\ensuremath{\mathbf{X}}}
\newunicodechar{Y}{\ensuremath{\mathbf{Y}}}
\newunicodechar{Z}{\ensuremath{\mathbf{Z}}}
```

3 Other letters or letterlike symbols

```
\newunicodechar{ℓ}{\ensuremath{\ell}}
```

4 Subscripts, superscripts, underscripts, and overscripts

Note that while the alphabetic lists are complete, **there are missing letters**, because unfortunately Unicode does not have characters for every letter subscript and superscript.

4.1 Subscripts

Note there are no uppercase letter subscripts.

4.1.1 Lowercase alphabet

```
\newunicodechar{ₐ}{\ensuremath{{}_{a}}}
\newunicodechar{ₑ}{\ensuremath{{}_{e}}}
\newunicodechar{ₕ}{\ensuremath{{}_{h}}}
\newunicodechar{ᵢ}{\ensuremath{{}_{i}}}
\newunicodechar{ⱼ}{\ensuremath{{}_{j}}}
\newunicodechar{ₖ}{\ensuremath{{}_{k}}}
\newunicodechar{ₗ}{\ensuremath{{}_{l}}}
\newunicodechar{ₘ}{\ensuremath{{}_{m}}}
\newunicodechar{ₙ}{\ensuremath{{}_{n}}}
\newunicodechar{ₒ}{\ensuremath{{}_{o}}}
\newunicodechar{ₚ}{\ensuremath{{}_{p}}}
\newunicodechar{ᵣ}{\ensuremath{{}_{r}}}
\newunicodechar{ₛ}{\ensuremath{{}_{s}}}
\newunicodechar{ₜ}{\ensuremath{{}_{t}}}
\newunicodechar{ᵤ}{\ensuremath{{}_{u}}}
\newunicodechar{ᵥ}{\ensuremath{{}_{v}}}
\newunicodechar{ₓ}{\ensuremath{{}_{x}}}
```

4.1.2 Numeric

```
\newunicodechar{₀}{\ensuremath{{}_{0}}}
\newunicodechar{₁}{\ensuremath{{}_{1}}}
\newunicodechar{₂}{\ensuremath{{}_{2}}}
\newunicodechar{₃}{\ensuremath{{}_{3}}}
\newunicodechar{₄}{\ensuremath{{}_{4}}}
\newunicodechar{₅}{\ensuremath{{}_{5}}}
\newunicodechar{₆}{\ensuremath{{}_{6}}}
\newunicodechar{₇}{\ensuremath{{}_{7}}}
\newunicodechar{₈}{\ensuremath{{}_{8}}}
\newunicodechar{₉}{\ensuremath{{}_{9}}}
```

4.1.3 Other

```
\newunicodechar{₊}{\ensuremath{{}_{+}}}
```

To contrast with subscript addition '$_{+}$', one may use subscript letter 'x' as a subscript multiplication.

4.2 Superscripts

4.2.1 Uppercase alphabet

```
\newunicodechar{ᴬ}{\ensuremath{{}^{A}}}
\newunicodechar{ᴮ}{\ensuremath{{}^{B}}}
\newunicodechar{ᴰ}{\ensuremath{{}^{D}}}
\newunicodechar{ᴱ}{\ensuremath{{}^{E}}}
\newunicodechar{ᴳ}{\ensuremath{{}^{G}}}
\newunicodechar{ᴴ}{\ensuremath{{}^{H}}}
\newunicodechar{ᴵ}{\ensuremath{{}^{I}}}
\newunicodechar{ᴶ}{\ensuremath{{}^{J}}}
\newunicodechar{ᴷ}{\ensuremath{{}^{K}}}
\newunicodechar{ᴸ}{\ensuremath{{}^{L}}}
\newunicodechar{ᴹ}{\ensuremath{{}^{M}}}
\newunicodechar{ᴺ}{\ensuremath{{}^{N}}}
\newunicodechar{ᴼ}{\ensuremath{{}^{O}}}
\newunicodechar{ᴾ}{\ensuremath{{}^{P}}}
\newunicodechar{ᴿ}{\ensuremath{{}^{R}}}
\newunicodechar{ᵀ}{\ensuremath{{}^{T}}}
\newunicodechar{ᵁ}{\ensuremath{{}^{U}}}
\newunicodechar{ⱽ}{\ensuremath{{}^{V}}}
\newunicodechar{ᵂ}{\ensuremath{{}^{W}}}
```

4.2.2 Lowercase alphabet

```
\newunicodechar{ᵃ}{\ensuremath{{}^{a}}}
\newunicodechar{ᵇ}{\ensuremath{{}^{b}}}
\newunicodechar{ᶜ}{\ensuremath{{}^{c}}}
\newunicodechar{ᵈ}{\ensuremath{{}^{d}}}
\newunicodechar{ᵉ}{\ensuremath{{}^{e}}}
\newunicodechar{ᶠ}{\ensuremath{{}^{f}}}
\newunicodechar{ᵍ}{\ensuremath{{}^{g}}}
\newunicodechar{ʰ}{\ensuremath{{}^{h}}}
\newunicodechar{ⁱ}{\ensuremath{{}^{i}}}
\newunicodechar{ʲ}{\ensuremath{{}^{j}}}
\newunicodechar{ᵏ}{\ensuremath{{}^{k}}}
\newunicodechar{ˡ}{\ensuremath{{}^{l}}}
\newunicodechar{ᵐ}{\ensuremath{{}^{m}}}
\newunicodechar{ⁿ}{\ensuremath{{}^{n}}}
\newunicodechar{ᵒ}{\ensuremath{{}^{o}}}
```

```
\newunicodechar{ᵖ}{\ensuremath{{}^{p}}}
\newunicodechar{ʳ}{\ensuremath{{}^{r}}}
\newunicodechar{ˢ}{\ensuremath{{}^{s}}}
\newunicodechar{ᵗ}{\ensuremath{{}^{t}}}
\newunicodechar{ᵘ}{\ensuremath{{}^{u}}}
\newunicodechar{ᵛ}{\ensuremath{{}^{v}}}
\newunicodechar{ʷ}{\ensuremath{{}^{w}}}
\newunicodechar{ˣ}{\ensuremath{{}^{x}}}
\newunicodechar{ʸ}{\ensuremath{{}^{y}}}
\newunicodechar{ᶻ}{\ensuremath{{}^{z}}}
```

4.2.3 Numeric

```
\newunicodechar{⁰}{\ensuremath{{}^{0}}}
\newunicodechar{¹}{\ensuremath{{}^{1}}}
\newunicodechar{²}{\ensuremath{{}^{2}}}
\newunicodechar{³}{\ensuremath{{}^{3}}}
\newunicodechar{⁴}{\ensuremath{{}^{4}}}
\newunicodechar{⁵}{\ensuremath{{}^{5}}}
\newunicodechar{⁶}{\ensuremath{{}^{6}}}
\newunicodechar{⁷}{\ensuremath{{}^{7}}}
\newunicodechar{⁸}{\ensuremath{{}^{8}}}
\newunicodechar{⁹}{\ensuremath{{}^{9}}}
```

4.2.4 Other

```
\newunicodechar{⁺}{\ensuremath{{}^{+}}}
```