Unicode declarations for LaTeX documents.

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March 11, 2020

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.

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\`

1.2 Requirements

This package depends upon the packages listed herein.

There are 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.

```
\usepackage{newunicodechar}
```

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

```
\usepackage{unicode-math}
```

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 Notes

:TODO: move the comments about missing characters here?

As discussed here, the prime characters are redefined by unicode-math at `\begindocument`. To redefine them, we would need to override that by wrapping out `\newunicodechar` declarations in `\AtBeginDocument`. Unfortunately we would then lose prime collapsing. The better solution is to use a font which has prime, or else avoid using double primes, etc..

3 Blackboard, calligraphic, etc. possiblycomplete

```
%-----------------------------------------------------------------------
% Blackboard, calligraphic, etc.
%-----------------------------------------------------------------------
```

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.

3.1 Blackboard possiblycomplete

```
%-------------------------------------------------------------
% Blackboard
%-------------------------------------------------------------
```

3.1.1 Lowercase latin complete

```
%-----------------------------------------------
% Lowercase 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}}}
```

3.1.2 Uppercase latin — complete

```
%-------------------------------------------------
% 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}}}
```

3.1.3 Arabic numerals — complete

```
%-------------------------------------------------
% Arabic numerals
%-------------------------------------------------

\newunicodechar{𝟙}{\ensuremath{\mathbb{1}}}
\newunicodechar{𝟚}{\ensuremath{\mathbb{2}}}
```

```
\newunicodechar{𝟛}{\ensuremath{\mathbb{3}}}
\newunicodechar{𝟜}{\ensuremath{\mathbb{4}}}
\newunicodechar{𝟝}{\ensuremath{\mathbb{5}}}
\newunicodechar{𝟞}{\ensuremath{\mathbb{6}}}
\newunicodechar{𝟟}{\ensuremath{\mathbb{7}}}
\newunicodechar{𝟠}{\ensuremath{\mathbb{8}}}
\newunicodechar{𝟡}{\ensuremath{\mathbb{9}}}
\newunicodechar{𝟘}{\ensuremath{\mathbb{0}}}
```

3.1.4 Greek — complete

```
%-------------------------------------------------
% Greek
%-------------------------------------------------
```

There are unfortunately not many included in Unicode.

```
\newunicodechar{ℾ}{\ensuremath{\mathbb{\Gamma}}}
\newunicodechar{ℽ}{\ensuremath{\mathbb{\gamma}}}
\newunicodechar{ℿ}{\ensuremath{\mathbb{\Pi}}}
\newunicodechar{𝕡}{\ensuremath{\mathbb{\pi}}}
\newunicodechar{⅀}{\ensuremath{\mathbb{\Sum}}}
```

3.2 Math calligraphic — possiblycomplete

```
%-------------------------------------------------------------
% Math calligraphic
%-------------------------------------------------------------
```

3.2.1 Lowercase latin — complete

```
%-------------------------------------------------
% 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}}}
```

3.2.2 Uppercase latin — complete

```
%-------------------------------------------------
% 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}}}
```

4 Other letters or letterlike symbols incomplete

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

5 Greek alphabet incomplete

5.1 Normal complete

```
\newunicodechar{α}{\ensuremath{\alpha}}
\newunicodechar{Α}{\ensuremath{\Alpha}}
\newunicodechar{β}{\ensuremath{\beta}}
\newunicodechar{Β}{\ensuremath{\Beta}}
\newunicodechar{γ}{\ensuremath{\gamma}}
\newunicodechar{Γ}{\ensuremath{\Gamma}}
\newunicodechar{δ}{\ensuremath{\delta}}
\newunicodechar{Δ}{\ensuremath{\Delta}}
\newunicodechar{ϵ}{\ensuremath{\epsilon}}
\newunicodechar{Ε}{\ensuremath{\Epsilon}}
\newunicodechar{ζ}{\ensuremath{\zeta}}
\newunicodechar{Ζ}{\ensuremath{\Zeta}}
\newunicodechar{η}{\ensuremath{\eta}}
\newunicodechar{Η}{\ensuremath{\Eta}}
\newunicodechar{θ}{\ensuremath{\theta}}
\newunicodechar{Θ}{\ensuremath{\Theta}}
\newunicodechar{ι}{\ensuremath{\iota}}
```

```
\newunicodechar{Ι}{\ensuremath{\Iota}}
\newunicodechar{κ}{\ensuremath{\kappa}}
\newunicodechar{Κ}{\ensuremath{\Kappa}}
\newunicodechar{λ}{\ensuremath{\lambda}}
\newunicodechar{Λ}{\ensuremath{\Lambda}}
\newunicodechar{μ}{\ensuremath{\mu}}
\newunicodechar{Μ}{\ensuremath{\Mu}}
\newunicodechar{ν}{\ensuremath{\nu}}
\newunicodechar{Ν}{\ensuremath{\Nu}}
\newunicodechar{ξ}{\ensuremath{\xi}}
\newunicodechar{Ξ}{\ensuremath{\Xi}}
\newunicodechar{ο}{\ensuremath{\omicron}}
\newunicodechar{Ο}{\ensuremath{\Omicron}}
\newunicodechar{π}{\ensuremath{\pi}}
\newunicodechar{Π}{\ensuremath{\Pi}}
\newunicodechar{ρ}{\ensuremath{\rho}}
\newunicodechar{Ρ}{\ensuremath{\Rho}}
\newunicodechar{σ}{\ensuremath{\sigma}}
\newunicodechar{Σ}{\ensuremath{\Sigma}}
\newunicodechar{τ}{\ensuremath{\tau}}
\newunicodechar{Τ}{\ensuremath{\Tau}}
\newunicodechar{υ}{\ensuremath{\upsilon}}
\newunicodechar{ϒ}{\ensuremath{\Upsilon}}
\newunicodechar{}{\ensuremath{\phi}}
\newunicodechar{Φ}{\ensuremath{\Phi}}
\newunicodechar{χ}{\ensuremath{\chi}}
\newunicodechar{Χ}{\ensuremath{\Chi}}
\newunicodechar{ψ}{\ensuremath{\psi}}
\newunicodechar{Ψ}{\ensuremath{\Psi}}
\newunicodechar{ω}{\ensuremath{\omega}}
\newunicodechar{Ω}{\ensuremath{\Omega}}
```

5.2 var-variants **incomplete**

Note that some of the default Agda input entries are in this list, rather than the default above.

Also, `varbeta` is missing here; it requires a choice of some other package to add support for it.

```
\newunicodechar{ε}{\ensuremath{\varepsilon}}
\newunicodechar{ϑ}{\ensuremath{\vartheta}}
```

```
\newunicodechar{ϰ}{\ensuremath{\varkappa}}
\newunicodechar{ϖ}{\ensuremath{\varpi}}
\newunicodechar{ς}{\ensuremath{\varsigma}}
\newunicodechar{φ}{\ensuremath{\varphi}}
```

6 Subscripts, superscripts, underscripts, and overscripts incomplete

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.

6.1 Subscripts incomplete

Note there are no uppercase letter subscripts.

6.1.1 Lowercase alphabet complete

```
\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}}}
```

6.1.2 Numeric complete

```
\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}}}
```

6.1.3 Other incomplete

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

6.2 Superscripts incomplete

6.2.1 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}}}
```

6.2.2 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}}}
```

6.2.3 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}}}
```

6.2.4 Other

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

7 Punctuation and delimiters incomplete

7.1 Dots incomplete

```
\newunicodechar{…}{\ensuremath{\ldots}}
\newunicodechar{⋯}{\ensuremath{\cdots}}
\newunicodechar{⋮}{\ensuremath{\vdots}}
```

7.2 Dashes incomplete

```
\newunicodechar{–}{\ensuremath{\text{--}}}
\newunicodechar{—}{\ensuremath{\text{---}}}
```

7.3 Parentheses, braces and brackets incomplete

Note there are a few different braces I translate the same way. Braces and parentheses themselves are special characters in Agda, so they cannot be used in names.

```
\newunicodechar{⦇}{\ensuremath{(\!|}}
\newunicodechar{⦈}{\ensuremath{|\!)}}
\newunicodechar{⟨}{\ensuremath{\langle}}
\newunicodechar{⟩}{\ensuremath{\rangle}}
\newunicodechar{⟪}{\ensuremath{\langle\!\langle}}
\newunicodechar{⟫}{\ensuremath{\rangle\!\rangle}}
\newunicodechar{｛}{\ensuremath{\{}}
\newunicodechar{｝}{\ensuremath{\}}}
\newunicodechar{{}{\ensuremath{\{}}
\newunicodechar{}}{\ensuremath{\}}}
```

7.4 Other paired delimiters

```
\newunicodechar{⌜}{\ensuremath{\ulcorner}}
\newunicodechar{⌝}{\ensuremath{\urcorner}}
\newunicodechar{⌞}{\ensuremath{\llcorner}}
\newunicodechar{⌟}{\ensuremath{\lrcorner}}
\newunicodechar{⌈}{\ensuremath{\lceil}}
\newunicodechar{⌉}{\ensuremath{\rceil}}
\newunicodechar{⌊}{\ensuremath{\lfloor}}
\newunicodechar{⌋}{\ensuremath{\rfloor}}
```

7.5 Whitespace

Non-breaking space. Though it may appear as a normal space, it is in fact a ~ in the LaTeX.

```
\newunicodechar{ }{\ensuremath{~}}
```

I am a very long line whose words are separated by non-breaking spaces so I should run off the page at

8 Logic incomplete

8.1 Quantifiers incomplete

```
\newunicodechar{∀}{\ensuremath{\forall}}
\newunicodechar{∃}{\ensuremath{\exists}}
```

8.2 Boolean algebra incomplete

```
\newunicodechar{≡}{\ensuremath{\equiv}}
\newunicodechar{¬}{\ensuremath{\lnot}}
\newunicodechar{≢}{\ensuremath{\nequiv}}
\newunicodechar{∨}{\ensuremath{\lor}}
\newunicodechar{∧}{\ensuremath{\land}}
\newunicodechar{ ⇒ }{\ensuremath{\;\Rightarrow\;}}
\newunicodechar{ ⇒ }{\ensuremath{\;\Rightarrow\;}}
\newunicodechar{ ⟺ }{\ensuremath{\iff}}
```

8.3 Entailment

```
\newunicodechar{⊢}{\ensuremath{\vdash}}
\newunicodechar{⊣}{\ensuremath{\dashv}}
\newunicodechar{⊨}{\ensuremath{\vDash}}
```

9 Sets, relations and functions incomplete

9.1 Sets incomplete

```
\newunicodechar{∅}{\ensuremath{\emptyset}}
\newunicodechar{∅}{\ensuremath{\emptyset}}
\newunicodechar{∈}{\ensuremath{\in}}
\newunicodechar{∉}{\ensuremath{\not\in}}
\newunicodechar{∋}{\ensuremath{\ni}}
```

```
\newunicodechar{∩}{\ensuremath{\cap}}
\newunicodechar{∪}{\ensuremath{\cup}}
\newunicodechar{⊎}{\ensuremath{\uplus}}
\newunicodechar{⊎}{\ensuremath{\uplus}}
```

9.2 Relation operators — incomplete

```
\newunicodechar{⊤}{\ensuremath{\top}}
\newunicodechar{⊥}{\ensuremath{\bot}}
\newunicodechar{⊔}{\ensuremath{\sqcup}}
\newunicodechar{⊓}{\ensuremath{\sqcap}}
```

9.3 Function operators — incomplete

```
\newunicodechar{∘}{\ensuremath{\circ}}
```

9.4 Relations — incomplete

9.4.1 Equality like

Along with negations where they exist. Note that equivalences are within the 8 section.

```
\newunicodechar{≠}{\ensuremath{\neq}}
\newunicodechar{≐}{\ensuremath{\doteq}}
\newunicodechar{≟}{\ensuremath{\stackrel{?}{=}}}
\newunicodechar{≅}{\ensuremath{\cong}}
\newunicodechar{≇}{\ensuremath{\ncong}}
\newunicodechar{≃}{\ensuremath{\simeq}}
\newunicodechar{≄}{\ensuremath{\nsimeq}}
\newunicodechar{≈}{\ensuremath{\approx}}
\newunicodechar{≉}{\ensuremath{\napprox}}
\newunicodechar{∼}{\ensuremath{\sim}}
\newunicodechar{≁}{\ensuremath{\nsim}}
\newunicodechar{≔}{\ensuremath{:\!=}}
```

9.4.2 Order like

```
\newunicodechar{≤}{\ensuremath{\leq}}
\newunicodechar{≰}{\ensuremath{\nleq}}
\newunicodechar{≥}{\ensuremath{\geq}}
\newunicodechar{≱}{\ensuremath{\ngeq}}
```

```
\newunicodechar{≮}{\ensuremath{\nless}}
\newunicodechar{≯}{\ensuremath{\ngtr}}
\newunicodechar{≦}{\ensuremath{\leqq}}
\newunicodechar{≨}{\ensuremath{\lneqq}}
\newunicodechar{≧}{\ensuremath{\geqq}}
\newunicodechar{≩}{\ensuremath{\gneqq}}
\newunicodechar{≲}{\ensuremath{\lesssim}}
\newunicodechar{≳}{\ensuremath{\gtrsim}}
\newunicodechar{⊏}{\ensuremath{\sqsubset}}
\newunicodechar{⊑}{\ensuremath{\sqsubseteq}}
\newunicodechar{⊐}{\ensuremath{\sqsupset}}
\newunicodechar{⊒}{\ensuremath{\sqsupseteq}}
\newunicodechar{|}{\ensuremath{\mid}}
```

10 Generic or other operators

10.1 Arrows

```
\newunicodechar{→}{\ensuremath{\rightarrow}}
\newunicodechar{←}{\ensuremath{\leftarrow}}
\newunicodechar{↑}{\ensuremath{\uparrow}}
\newunicodechar{↓}{\ensuremath{\downarrow}}
\newunicodechar{⟶}{\ensuremath{\longrightarrow}}
\newunicodechar{⟵}{\ensuremath{\longleftarrow}}
```

10.2 “o”-operators

```
\newunicodechar{⊕}{\ensuremath{\oplus}}
\newunicodechar{⊖}{\ensuremath{\ominus}}
\newunicodechar{⊗}{\ensuremath{\otimes}}
\newunicodechar{⊘}{\ensuremath{\oslash}}
\newunicodechar{⊙}{\ensuremath{\odot}}
\newunicodechar{◎}{\ensuremath{\circledcirc}}
\newunicodechar{⊛}{\ensuremath{\circledast}}
\newunicodechar{⊜}{\ensuremath{\circledequal}}
\newunicodechar{⊝}{\ensuremath{\circleddash}}
```

10.3 Small, halfwidth and fullwidth math symbols

For small characters, we use `scalebox` on the corresponding symbols, and `raisebox` to correct for height.

```
\newunicodechar{*}{\ensuremath{\raisebox{.4\height}{\scalebox{.6}{*}}}}
\newunicodechar{+}{\ensuremath{\raisebox{.4\height}{\scalebox{.6}{+}}}}
\newunicodechar{-}{\ensuremath{\raisebox{.4\height}{\scalebox{.6}{-}}}}
\newunicodechar{<}{\ensuremath{\raisebox{.4\height}{\scalebox{.6}{<}}}}
\newunicodechar{>}{\ensuremath{\raisebox{.4\height}{\scalebox{.6}{>}}}}
\newunicodechar{=}{\ensuremath{\raisebox{.4\height}{\scalebox{.6}{=}}}}
\newunicodechar{\}{\ensuremath{\raisebox{.4\height}{\scalebox{.6}{\backslash}}}}
```

For fullwidth characters, we place them in a `1em` box. Note the "plain TEX" method for obtaining a non-raised tilde here.

```
\newunicodechar{＋}{\ensuremath{\makebox[1em]{+}}}
\newunicodechar{＜}{\ensuremath{\makebox[1em]{<}}}
\newunicodechar{＝}{\ensuremath{\makebox[1em]{=}}}
\newunicodechar{＞}{\ensuremath{\makebox[1em]{>}}}
\newunicodechar{＾}{\ensuremath{\makebox[1em]{\textasciicircum}}}
\newunicodechar{｜}{\ensuremath{\makebox[1em]{|}}}
\newunicodechar{～}{\ensuremath{\makebox[1em]{\char`\~}}}
\newunicodechar{￢}{\ensuremath{\makebox[1em]{\lnot}}}
```

So far, I haven't devised a good solution for the halfwidth arrows. I just substitute the regular arrows in.

```
\newunicodechar{←}{\ensuremath{\leftarrow}}
\newunicodechar{↑}{\ensuremath{\uparrow}}
\newunicodechar{→}{\ensuremath{\rightarrow}}
\newunicodechar{↓}{\ensuremath{\downarrow}}
```

10.4 Punctuation like

```
\newunicodechar{}{\ensuremath{\ratio}}
\newunicodechar{}{\ensuremath{\fcmp}}
```

10.5 Others

Probably some of these belong somewhere else.

```
\newunicodechar{·}{\ensuremath{\cdot}}
\newunicodechar{∞}{\ensuremath{\infty}}
```

11 Emoticons

11.1 Check and X-marks

```
\newunicodechar{✓}{\ensuremath{\checkmark}}
\newunicodechar{×}{\ensuremath{\times}}
```

11.2 Smilies

I have not found a reliable way to produce smilies in LaTeX. In LuaLaTeX and XeLaTeX, it should work to just use the unicode characters themselves, making sure to use a font that supports them. DejaVu Sans does so.

```
\newfontfamily\DejaSans{DejaVu Sans}
```

So these characters can only be used if you use LuaLaTeX or XeLaTeX.

```
\newunicodechar{😀}{{\DejaSans 😀}}
\newunicodechar{😁}{{\DejaSans 😁}}
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