The unicodehat package

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Abstract

Maps all precomposed Unicode Latin letters bearing a single circumflex accent to the corresponding hatted letters in mathematics, while preserving the original characters in text. Intended for directly typed quantum-mechanical operator notation.

1 Usage

Use UTF-8 input with LuaLaTeX or XeLaTeX. For text, choose a font containing the input characters:

```
\documentclass{article}
\usepackage{fontspec}
\usepackage{unicodehat}
\begin{document}
Text: Ĥ. Mathematics: $Ĥ = Ê$.
\end{document}
```

In mathematics, for example, Ĥ expands to `\hat{H}`. Outside mathematics the original Unicode character is retained. The package uses newunicodechar and defines no package options.

2 Character mappings

The following input characters map to hats over the corresponding Latin letters, in the same order:

```
Input: Â Ê Î Ô Û Ĉ Ĝ Ĥ Ĵ Ŝ Ŵ Ŷ Ẑ
Base:  A E I O U C G H J S W Y Z
Input: â ê î ô û ĉ ĝ ĥ ĵ ŝ ŵ ŷ ẑ
Base:  a e i o u c g h j s w y z
```

These 26 mappings cover all precomposed Unicode characters consisting of a basic Latin letter (A–Z or a–z) with a single circumflex accent above: 13 letters in both uppercase and lowercase.

Only these single-code-point characters are remapped. Combining sequences, such as `H` followed by U+0302 (COMBINING CIRCUMFLEX ACCENT), are not supported, even though they can look identical to Ĥ (U+0124). For combining sequences with LuaLaTeX, use luamathaccents; for example, it converts `x` followed by U+0302 to `\hat{x}`, without needing a precomposed Unicode character. It does not convert precomposed characters such as Ĥ to math accents.

Font coverage. The precomposed characters Ẑ (U+1E90) and ẑ (U+1E91) are missing from some text fonts, including Latin Modern Mono. In regular text, choose a font containing these glyphs; this documentation uses DejaVu Sans Mono for the character mappings and code listings. In mathematics, the package expands them to `\hat{Z}` and `\hat{z}`, so these two Unicode glyphs are not needed in the font.

3 Implementation

```
⟨*package⟩
\NeedsTeXFormat{LaTeX2e}
\ProvidesPackage{unicodehat}
  [2026/11/16 v1.0.0 Unicode circumflex letters in mathematics]
\RequirePackage{newunicodechar}

```

Declare an internal helper for the character mappings.

```
\newcommand*\unicodehat@def[2]
  {\newunicodechar{#2}{\ifmmode\hat{#1}\else{#2}\fi}}
```

Declare all 26 precomposed circumflex mappings.

```
\unicodehat@def A Â
\unicodehat@def E Ê
\unicodehat@def I Î
\unicodehat@def O Ô
\unicodehat@def U Û
\unicodehat@def C Ĉ
\unicodehat@def G Ĝ
\unicodehat@def H Ĥ
\unicodehat@def J Ĵ
\unicodehat@def S Ŝ
\unicodehat@def W Ŵ
\unicodehat@def Y Ŷ
\unicodehat@def Z Ẑ

\unicodehat@def a â
\unicodehat@def e ê
\unicodehat@def i î
\unicodehat@def o ô
\unicodehat@def u û
\unicodehat@def c ĉ
\unicodehat@def g ĝ
\unicodehat@def h ĥ
\unicodehat@def j ĵ
\unicodehat@def s ŝ
\unicodehat@def w ŵ
\unicodehat@def y ŷ
\unicodehat@def z ẑ
\endinput
⟨/package⟩
```