

Latex Special Symbols

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Dependencies:

```
\usepackage{mathtools}  
\usepackage{bm}  
\usepackage{accents}
```

1 Bold Romans and Greeks

Testing `\mathbf`:

$$\begin{aligned} & \textit{mathbfthisisboldnotbold} \\ & a + b + \mathbf{a} + \mathbf{b} + a + b \\ & A + B + \mathbf{A} + \mathbf{B} + A + B \\ & \alpha + \beta + \alpha + \beta + \alpha + \beta \end{aligned} \tag{1}$$

Testing `\boldsymbol`:

$$\begin{aligned} & \textit{boldsymbolthisisboldsymbolnotboldsymbol} \\ & a + b + \boldsymbol{a} + \boldsymbol{b} + a + b \\ & A + B + \boldsymbol{A} + \boldsymbol{B} + A + B \\ & \alpha + \beta + \boldsymbol{\alpha} + \boldsymbol{\beta} + \alpha + \beta \end{aligned} \tag{2}$$

2 Under and Below Hat, Bar and Tilde

Under and below bar, allowing for bold notation for vector.

*<https://fanwangecon.github.io>, repository: [Tex4Econ](#)

2.1 Accents Package

Reference:

- [SE: bar-below-symbol](#)
- [SE: Making hats \(and other accents\) bold](#)

2.1.1 Accents Package Regular Font

Define:

```
\newcommand{\uhat}[1]{\underaccent{\hat}{#1}}
\newcommand{\ubar}[1]{\underaccent{\bar}{#1}}
\newcommand{\utilde}[1]{\underaccent{\tilde}{#1}}
```

Now write letters with under and over bars etc:

```
\hat{ABC}, \bar{ABC}, \tilde{ABC},
\uhat{ABC}, \ubar{ABC}, \utilde{ABC},
```

$$\begin{aligned}
 &\hat{a}, \bar{a}, \tilde{a}, \underset{\sim}{a}, \underset{\sim}{a}, \underset{\sim}{a}, \hat{A}, \bar{A}, \tilde{A}, \underset{\sim}{A}, \underset{\sim}{A}, \underset{\sim}{A} \\
 &\hat{a}\hat{b}\hat{c}, \bar{a}\bar{b}\bar{c}, \tilde{a}\tilde{b}\tilde{c}, \underset{\sim}{a}\underset{\sim}{b}\underset{\sim}{c}, \underset{\sim}{a}\underset{\sim}{b}\underset{\sim}{c}, \underset{\sim}{a}\underset{\sim}{b}\underset{\sim}{c}, \hat{A}\hat{B}\hat{C}, \bar{A}\bar{B}\bar{C}, \tilde{A}\tilde{B}\tilde{C}, \underset{\sim}{A}\underset{\sim}{B}\underset{\sim}{C}, \underset{\sim}{A}\underset{\sim}{B}\underset{\sim}{C}, \underset{\sim}{A}\underset{\sim}{B}\underset{\sim}{C} \\
 &\hat{\alpha}, \bar{\alpha}, \tilde{\alpha}, \underset{\sim}{\alpha}, \underset{\sim}{\alpha}, \underset{\sim}{\alpha}, \hat{\alpha}, \bar{\alpha}, \tilde{\alpha}, \underset{\sim}{\alpha}, \underset{\sim}{\alpha}, \underset{\sim}{\alpha} \\
 &\alpha\hat{\Gamma}\beta, \alpha\bar{\Gamma}\beta, \alpha\tilde{\Gamma}\beta, \alpha\underset{\sim}{\Gamma}\beta, \alpha\underset{\sim}{\Gamma}\beta, \alpha\underset{\sim}{\Gamma}\beta, \alpha\hat{\Gamma}\beta, \alpha\bar{\Gamma}\beta, \alpha\tilde{\Gamma}\beta, \alpha\underset{\sim}{\Gamma}\beta, \alpha\underset{\sim}{\Gamma}\beta, \alpha\underset{\sim}{\Gamma}\beta
 \end{aligned} \tag{3}$$

2.1.2 Accents Package Bold

Define these new commands that combine [accent](#) and the [bm](#) packages. Note that the accents are defined outside of the bold letters, so accents are not bold. Can not define bold accents with bm directly using the accents package it seems:

```
\newcommand{\hatbm}[1]{\hat{\bm{#1}}}
\newcommand{\barbm}[1]{\bar{\bm{#1}}}
\newcommand{\tildebm}[1]{\tilde{\bm{#1}}}
\newcommand{\uhatbm}[1]{\underaccent{\hat}{\bm{#1}}}
\newcommand{\ubarbm}[1]{\underaccent{\bar}{\bm{#1}}}
\newcommand{\utildebm}[1]{\underaccent{\tilde}{\bm{#1}}}
```

Now write letters with under and over bars etc:

`\hatbm{ABC}`, `\barbm{ABC}`, `\tildebm{ABC}`,
`\uhatbm{ABC}`, `\ubarbm{ABC}`, `\utildebm{ABC}`,

$$\begin{aligned}
&\hat{\Gamma}, \Gamma\beta \\
&\bar{a}, \underline{a} \\
&\tilde{a}, \underline{a} \\
&\hat{a}, \bar{a}, \tilde{a}, \underline{a}, \underline{a}, \underline{a}, \hat{A}, \bar{A}, \tilde{A}, \underline{A}, \underline{A}, \underline{A}, \\
&\hat{abc}, \bar{abc}, \tilde{abc}, \underline{abc}, \underline{abc}, \underline{abc}, \hat{ABC}, \bar{ABC}, \tilde{ABC}, \underline{ABC}, \underline{ABC}, \underline{ABC}, \\
&\hat{\alpha}, \bar{\alpha}, \tilde{\alpha}, \underline{\alpha}, \underline{\alpha}, \underline{\alpha}, \hat{\alpha}, \bar{\alpha}, \tilde{\alpha}, \underline{\alpha}, \underline{\alpha}, \underline{\alpha} \\
&\alpha\hat{\Gamma}\beta, \alpha\bar{\Gamma}\beta, \alpha\tilde{\Gamma}\beta, \alpha\underline{\Gamma}\beta, \alpha\underline{\Gamma}\beta, \alpha\underline{\Gamma}\beta, \alpha\hat{\Gamma}\beta, \alpha\bar{\Gamma}\beta, \alpha\tilde{\Gamma}\beta, \alpha\underline{\Gamma}\beta, \alpha\underline{\Gamma}\beta, \alpha\underline{\Gamma}\beta
\end{aligned} \tag{4}$$

2.1.3 Mathcal and Accents

`\bar{\mathcal{Q}}^{\mathcal{C}}`, `\ubar{\mathcal{Q}}^{\mathcal{C}}`,
`\barbm{\mathcal{Q}}^{\mathcal{C}}`, `\ubarbm{\mathcal{Q}}^{\mathcal{C}}`

$$\begin{aligned}
&\bar{\mathcal{A}}, \mathcal{A}, \bar{\mathcal{A}}, \underline{\mathcal{A}} \\
&\bar{\mathcal{Q}}^{\mathcal{C}}, \underline{\mathcal{Q}}^{\mathcal{C}}, \bar{\mathcal{Q}}^{\mathcal{C}}, \underline{\mathcal{Q}}^{\mathcal{C}} \\
&\tilde{\mathcal{A}}, \mathcal{A}, \tilde{\mathcal{A}}, \underline{\mathcal{A}} \\
&\tilde{\mathcal{Q}}^{\mathcal{C}}, \underline{\mathcal{Q}}^{\mathcal{C}}, \tilde{\mathcal{Q}}^{\mathcal{C}}, \underline{\mathcal{Q}}^{\mathcal{C}}
\end{aligned} \tag{5}$$

2.1.4 bm and Underline and Overline

Rather than using bar and under bar that are fixed width, use underline and overline which change width and can change in boldness.

`\newcommand{\overlinebm}[1]{\bm{\overline{#1}}}`
`\newcommand{\underlinebm}[1]{\bm{\underline{#1}}}`
`\bar{\mathcal{Q}}^{\mathcal{C}}`, `\ubar{\mathcal{Q}}^{\mathcal{C}}`,
`\barbm{\mathcal{Q}}^{\mathcal{C}}`, `\ubarbm{\mathcal{Q}}^{\mathcal{C}}`

$$\begin{aligned}
&\overline{\mathcal{Q}}^{\mathcal{C}}, \underline{\mathcal{Q}}^{\mathcal{C}}, \overline{\mathcal{ABC}}^{\mathcal{C}}, \underline{\mathcal{ABC}}^{\mathcal{C}} \\
&\overline{\alpha\Gamma\beta}, \underline{\alpha\Gamma\beta}
\end{aligned} \tag{6}$$