

Basics of writing LaTeX in markdown

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We will use some basic LaTeX for formatting mathematical expressions in markdown.

To do this, you'll need to have a working LaTeX installation—if you're already able to compile pdf documents, you should be good to go.

We'll write mathematical expressions two ways:

- “Inline” math is written using a single dollar sign, \$, on either side of the expression. For example, $Y = \frac{\beta_0 + \beta_1 X}{1}$ is rendered as $Y = \beta_0 + \beta_1 X$.
- “Display” equations are written using double dollar signs, $\$$. For example,
$$Y = \beta_0 + \beta_1 X$$
 is rendered as

$$Y = \beta_0 + \beta_1 X.$$

Inside of these mathematical expressions, the backslash, \ indicates a specific LaTeX command. In particular, we'll use commands for Greek letters, listed below. And you can use $\frac{\text{<numerator>}}{\text{<denominator>}}$ for fractions, and $^$ for exponents.

Putting these elements together, the expression, $\frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}$ is rendered as,

$$\frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}.$$

Greek alphabet:

name	lowercase	lowercase tex	uppercase	uppercase tex
alpha	α	$\backslash\alpha$	A	$\backslash\mathrm{A}$
beta	β	$\backslash\beta$	B	$\backslash\mathrm{B}$
gamma	γ	$\backslash\gamma$	Γ	$\backslash\mathrm{Gamma}$
delta	δ	$\backslash\delta$	Δ	$\backslash\mathrm{Delta}$
epsilon	ϵ	$\backslash\epsilon$	$E < br >$	$\backslash\mathrm{E}$
zeta	ζ	$\backslash\zeta$	Z	$\backslash\mathrm{Z}$
eta	η	$\backslash\eta$	H	$\backslash\mathrm{H}$
theta	θ	$\backslash\theta$	Θ	$\backslash\mathrm{Theta}$
iota	ι	$\backslash\iota$	I	$\backslash\mathrm{I}$
kappa	κ	$\backslash\kappa$	K	$\backslash\mathrm{K}$
lambda	λ	$\backslash\lambda$	Λ	$\backslash\mathrm{Lambda}$
mu	μ	$\backslash\mu$	M	$\backslash\mathrm{M}$
nu	ν	$\backslash\nu$	N	$\backslash\mathrm{N}$
xi	ξ	$\backslash\xi$	Ξ	$\backslash\mathrm{Xi}$
omicron	\omicron	$\backslash\mathrm{O}$	O	$\backslash\mathrm{O}$

name	lowercase	lowercase tex	uppercase	uppercase tex
pi	π	<code>\pi</code>	Π	<code>\Pi</code>
rho	ρ	<code>\rho</code>	P	<code>\textrm{P}</code>
sigma	σ	<code>\sigma</code>	Σ	<code>\Sigma</code>
tau	τ	<code>\tau</code>	T	<code>\textrm{T}</code>
upsilon	υ	<code>\upsilon</code>	Υ	<code>\Upsilon</code>
phi	ϕ	<code>\phi</code>	Φ	<code>\Phi</code>
chi	χ	<code>\chi</code>	X	<code>\textrm{X}</code>
psi	ψ	<code>\psi</code>	Ψ	<code>\Psi</code>
omega	ω	<code>\omega</code>	Ω	<code>\Omega</code>

Some of the uppercase letters, and omicron, don't have specific tex versions because they look like the regular latin letters. We put `\textrm{<>}` around these characters when we use them in mathematical expressions. This is because text characters in mathematical expressions are italicized by default; `\textrm{<>}` makes them not italicized. In general, in mathematical expressions italicized letters, like X and x , are interpreted as *variables*, which may vary across observations. Whereas non-italicized letters are interpreted as constants, which do not vary.

Aside: I often work up tables using www.tablesgenerator.com; you can navigate to different tabs to create tables in LaTeX, markdown, etc.