Bare-Bones Latex Template

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1 Introduction

This is a "bare-bones" latex template. I will demonstrate how to do the simplest but most useful things.

1.1 Equations With Numbers

To start, how do I write an equation? Consider the equation

$$y = mx + b. \tag{1}$$

Notice two things. First, notice there's an equation number. Second, notice the variable name "eq:line" under the equation and the command "label". I can use that variable name to then reference Eq. (1).

1.2 Equations Without Numbers

Sometimes you don't want to number an equation, so you'd write

$$\mathbf{Ax} = \mathbf{b},$$

where I used "displaymath" rather than "equation" in the code. I can't reference this equation because it does not have a number, which is why I don't give it a variable name

2 Matrices and Arrays

Sometimes you need to have an equation array:

$$\begin{aligned} \begin{bmatrix} a & b \\ c & d \end{bmatrix} &= \begin{bmatrix} x \\ y \end{bmatrix} && (2) \\ &= \begin{bmatrix} ax + by \\ cx + dy \end{bmatrix}. && (3) \end{aligned}$$

Notice how there's two more numbers. Say I didn't want them, then I'd write

$$\begin{aligned} \begin{bmatrix} a & b \\ c & d \end{bmatrix} &= \begin{bmatrix} x \\ y \end{bmatrix} \\ &= \begin{bmatrix} ax + by \\ cx + dy \end{bmatrix}. \end{aligned}$$

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Say I wanted one number and a label, but not both. Then I'd write

$$\begin{aligned} \begin{bmatrix} a & b \\ c & d \end{bmatrix} &= \begin{bmatrix} x \\ y \end{bmatrix} \\ &= \begin{bmatrix} ax + by \\ cx + dy \end{bmatrix}, \end{aligned} \tag{4}$$

and now I can reference (4).

Notice I can use "label" to give a whole section a variable name, so I can then refer to the section, such as Section (1.2).

Also, note that you have to compile the latex code twice before your equation or section number will appear. When compiling a bibliography using bibtex you must compile as follows: "latex bibtex latex latex". This has to do with latex creating a list and then reading the list.

3 Closing Remarks

Latex is awesome. I hope you use it!