# Hello World

Myself :)

November 12

# 1 How you're doing?

## 1.1 fine thank you!

1. this is a numbered

2. ordered list

3. of items

And this is a
break line with ***bold-italic format.***

- This is a not numbered

- and not ordered

- list of items

- 
  1. and this is
  2. an ordered list
  3. inside of it

# 2 Math

A simple State-State representation of a Mass-Spring system:

$$\mathbf{x}(t) = \begin{bmatrix} x(t) \\ v(t) \end{bmatrix}$$

where $x(t)$ is the displacement and $v(t) = \frac{dx(t)}{dt}$ is the velocity.

The state-space equations are:

$$\frac{d}{dt} \begin{bmatrix} x(t) \\ v(t) \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ -\frac{k}{m} & 0 \end{bmatrix} \begin{bmatrix} x(t) \\ v(t) \end{bmatrix} + \begin{bmatrix} 0 \\ \frac{1}{m} \end{bmatrix} F(t)$$

and the output equation is:

$$y(t) = \begin{bmatrix} 1 & 0 \end{bmatrix} \begin{bmatrix} x(t) \\ v(t) \end{bmatrix}$$