

Sawyer's Python tutorial

Jupyter notebook

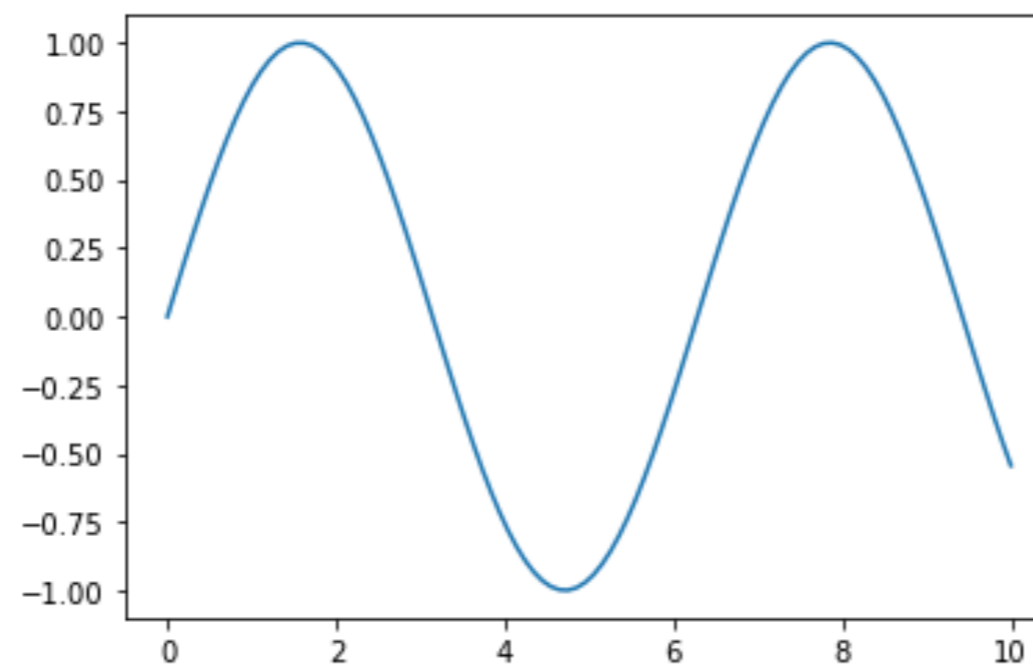


Each cell can have python code or text (documentation). Click on the drop-down box above to switch cell type.

Use <ctrl-Enter> to execute a cell (<Cmd-Enter> on mac)

```
In [8]: import numpy as np
import matplotlib.pyplot as plt
import control.matlab as ct
```

```
In [5]: x = np.linspace(0, 10, 100)
plt.plot(x, np.sin(x));
```



a short reference for differences between python vs. matlab

<https://numpy.org/doc/stable/user/numpy-for-matlab-users.html#table-of-rough-matlab-numpy-equivalents>

	MATLAB	PYTHON*
help	help function	function (<shift-Tab>
math operations	+, -, *, /, ^	+, -, *, /, **
create row array	a = [1 2 3];	a = np.array([1, 2, 3])
column array	b = [1; 2; 3];	b = np.array([[1], [2], [3]])
transpose a	c = a';	c = (homework exercise!)
transpose b	c = b';	c = b.T
first element	a(1);	a[0]
last element	a(end);	a[-1]
first row	a(1, :);	a[0, :]
height & width	size(a);	a.shape
matrix (dot) product	a * b;	a @ b
element-wise product	a .* b;	a * b
plot a function of 100 points from 0 to 10	x = linspace(0, 10, 100); plot(x, sin(x));	x = np.linspace(0, 10, 100) plt.plot(x, np.sin(x))

*assumes you have run the following lines first:

```
import numpy as np # arrays
import matplotlib.pyplot as plt # plots
```