4-Matplotlib (visualization)

September 13, 2019

___ ## Pedram Jahangiry (Fall 2019)

1 Matplotlib

[6]:
```
import matplotlib.pyplot as plt

# we don't need to write %matplotlib inline
```

If you are using another editor, you must use: **plt.show()** at the end of all your plotting commands to have the figure pop up in another window.

[7]:
```
import numpy as np
x = np.linspace(-5, 5, 20)
y = x ** 2 + 1
```

[8]:
```
x
```

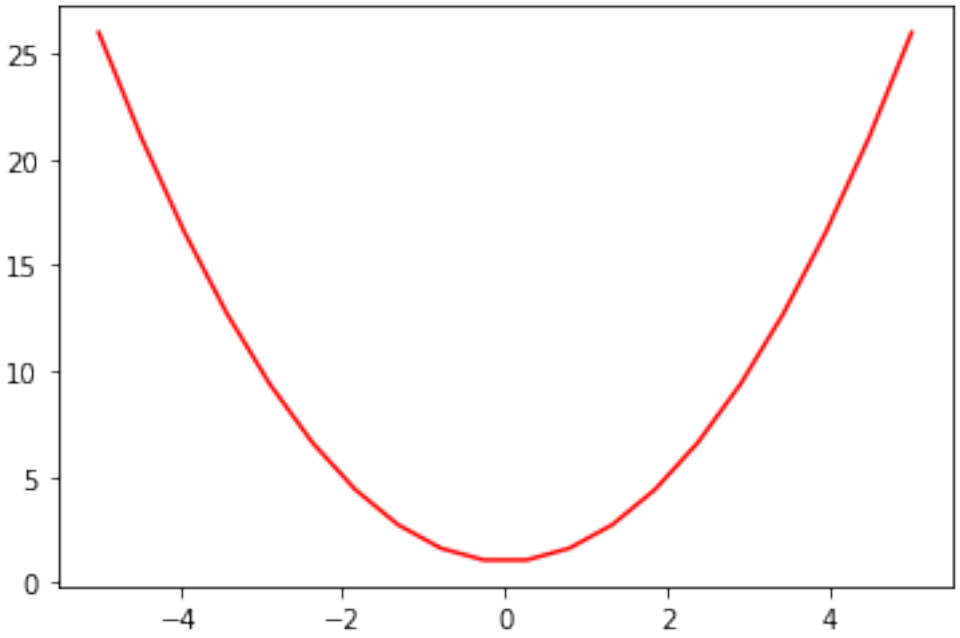
[8]:
```
array([-5.        , -4.47368421, -3.94736842, -3.42105263, -2.89473684,
       -2.36842105, -1.84210526, -1.31578947, -0.78947368, -0.26315789,
        0.26315789,  0.78947368,  1.31578947,  1.84210526,  2.36842105,
        2.89473684,  3.42105263,  3.94736842,  4.47368421,  5.        ])
```

[9]:
```
y
```

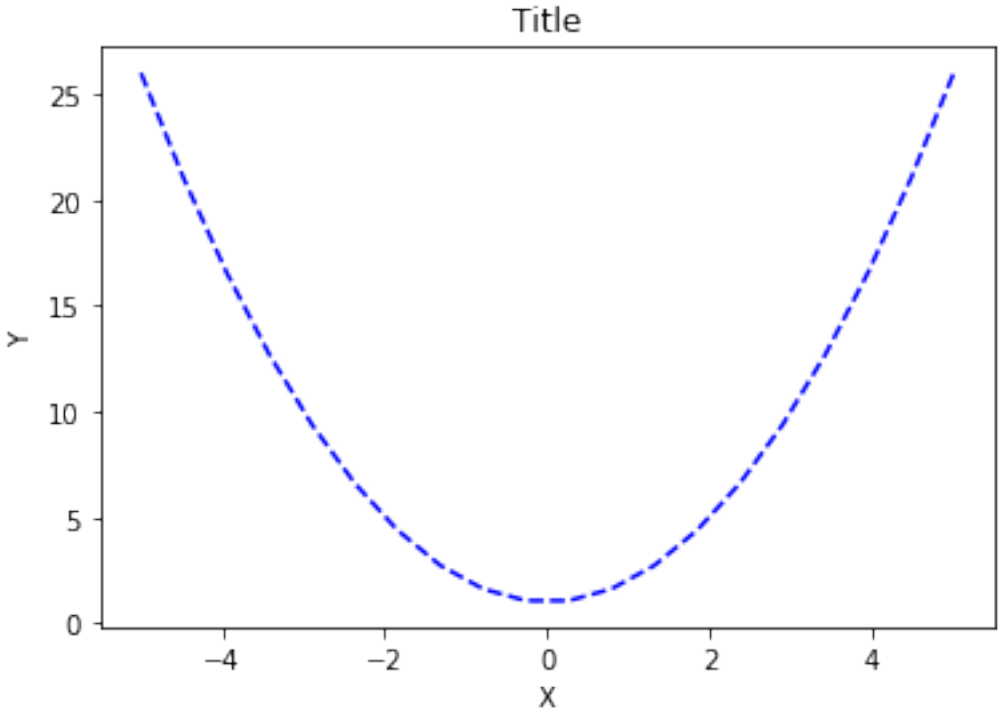
[9]:
```
array([26.        , 21.01385042, 16.58171745, 12.70360111,  9.37950139,
        6.60941828,  4.3933518 ,  2.73130194,  1.6232687 ,  1.06925208,
        1.06925208,  1.6232687 ,  2.73130194,  4.3933518 ,  6.60941828,
        9.37950139, 12.70360111, 16.58171745, 21.01385042, 26.        ])
```

[10]:
```
plt.plot(x, y, 'red')
```

[10]:
```
[<matplotlib.lines.Line2D at 0x2837ef68828>]
```

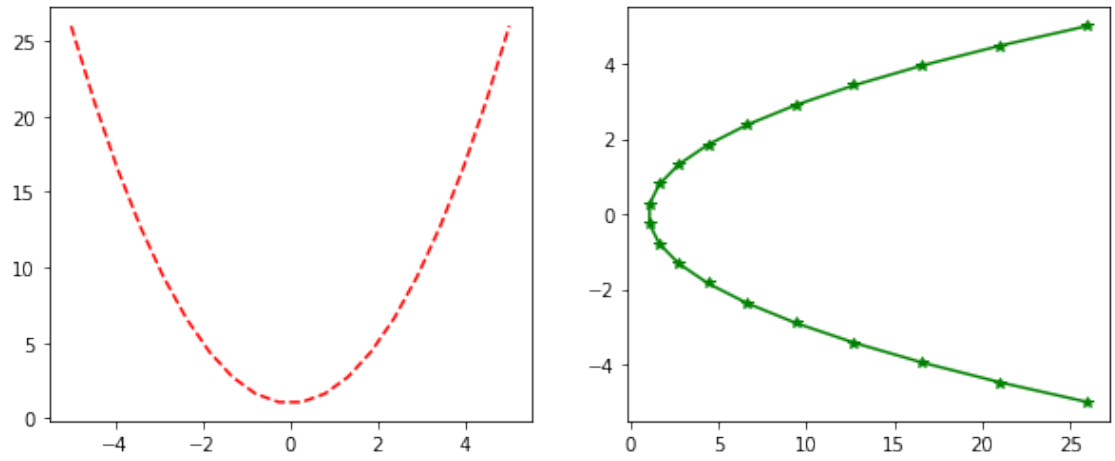


[11]:
```
plt.plot(x, y, 'b--')
plt.xlabel('X')
plt.ylabel('Y')
plt.title('Title')
plt.show()
```



[12]:
```
# adjusting the size
plt.figure(figsize=(10,4))


# plt.subplot(nrows, ncols, plot_number)
plt.subplot(1,2,1)
plt.plot(x, y, 'r--')
plt.subplot(1,2,2)
plt.plot(y, x, 'g*-');
```



To save a figure to a file we can use the `savefig` method in the `Figure` class:

[50]:
```
fig.savefig("my_fig.png")  # we can save it as a pdf as well.
```

Check out the matplotlib documentation website (http://matplotlib.org/gallery.html) to explore the following types of figures:

1. plt.hist(data)
2. plt.boxplot(data)
3. plt.scatter(x,y)
4. ....