

Introduction to Matplotlib

Pyplot functions

The Python library Matplotlib contains the pyplot module, which provides users with an interface for graphing data. Pyplot contains over 100 functions, from `acorr` to `yticks`. You must import the module, and `plt` is the standard variable name used.

```
from matplotlib import pyplot as  
plt
```

Here are some of the most common pyplot functions:

Function	Description
Plot	plots y versus x as line
Show	displays a figure
Axis	sets some axis properties
Xlabel	sets the label for the x-axis

Pyplot-axis

Matplotlib's `pyplot.axis` function takes one parameter, which must be a four-item array, and returns the current axes' limits. The four items should contain enough info to define an x axis and a y axis by minimum and maximum values. The array must order these values as follows: x-axis minimum, x-axis maximum, y-axis minimum, y-axis maximum.

<https://author.codecademy.com/learning-standards/5cc9c73faf246d6f7689df89>

```
x = range(12)  
y =  
[2, 8, 20, 40, 70, 300, 930, 7000, 68000, 500000, 4000  
 2000000]  
plt.plot(x, y)  
  
#x-axis minimum is 0, x-axis maximum is  
11; y-axis minimum is 300, y-axis maximum  
is 500000  
plt.axis([0, 11, 300, 500000])  
plt.show()
```

Setting Linestyle, Color in Matplotlib

In Python's Matplotlib, the `pyplot.plot()` function can accept parameters to set the color(`color`), linestyle(`linestyle`) and marker(`marker`) for line graph. Color values can be HTML color names or HEX codes. Line styles can be dashed(`'--'`) or dotted(`'..'`). Markers can be circles(`'o'`), squares(`'s'`), stars(`'*'`), or other shapes.

```
pyplot.plot(days, money_spent,
color='green', linestyle='--')
pyplot.plot(days, money_spent_2,
color='#AAAAAA', marker='o')
```

Adjusting Subplot Margins in Matplotlib

In Python's Matplotlib, subplots can overlap, either horizontally or vertically. The function `pyplot.subplots_adjust()` can set better spacing around each subplot in a figure. It can set values for left, right, bottom and top margins, plus the horizontal(`wspace`) and vertical(`hspace`) spaces between adjacent subplots.

```
import matplotlib.pyplot as plt

# Left Plot
plt.subplot(1, 2, 1)
plt.plot([-2, -1, 0, 1, 2], [4, 1, 0, 1, 4])

# Right Plot
plt.subplot(1, 2, 2)
plt.plot([-2, -1, 0, 1, 2], [4, 1, 0, 1, 4])

# Subplot Adjust
plt.subplots_adjust(wspace=1.3)

plt.show()
```

X-ticks and Y-ticks in Matplotlib

In Python's Matplotlib, the x-tick and y-tick marks of the plot can be changed using functions `ax.set_xticks()` and `ax.set_yticks()`. These functions accept an array of values representing tick mark positions.

```
import matplotlib.pyplot as plt

ax = plt.subplot()
plt.plot([0, 1, 2, 3, 4], [0, 1, 4, 9, 16])
plt.plot([0, 1, 2, 3, 4], [0, 1, 8, 27, 64])
ax.set_xticks([1, 2, 4])
```

Subplots in Matplotlib

In Python, the Matplotlib's `pyplot.subplot()` function can be used to create a figure with a grid of subplots. The function accepts number of rows, number of columns, and the current index as arguments.

```
import matplotlib.pyplot as plt

# Datasets
x = [1, 2, 3, 4]
y = [1, 2, 3, 4]

# First Subplot
plt.subplot(1, 2, 1)
plt.plot(x,y, color='green')
plt.title('First Subplot')

# Second Subplot
plt.subplot(1, 2, 2)
plt.plot(x,y, color='blue')
plt.title('Second Subplot')

# Display both subplots
plt.show()
```

Figures in Matplotlib

In Python's Matplotlib, a figure is a container that holds plots. It can hold a single plot or multiple plots. When a figure holds multiple separate plots, those are called subplots.