Matplotlib refresher

Getting started with Matplotlib

In this section, we'll give a brief introduction to the Matplotlib module which is one of the most popular Python packages used for data visualization.

Plot

The first function we introduce is `plot`, which allows you to plot 2D data.

```
import numpy as np
import matplotlib.pyplot as plt

# We plot the graph of y = x^2
x = np.arange(-10, 10) # x coordinate
y = x**2 # y coordinate

plt.plot(x, y) # Plot the graph
plt.show()  # You need to call plt.show() to show the plotted graph
```

Multiple functions

We can also plot multiple functions in the same graph, and add a title, legend, and axis labels:

```
import numpy as np
import matplotlib.pyplot as plt

# Create the x and y coordinates
x = np.arange(-10, 10)
y1 = x**2
y2 = x**3

# Plot multiple functions
plt.plot(x, y1)
plt.plot(x, y2)
plt.xlabel('x axis')
plt.ylabel('y axis')
plt.title('introduction to matplotlib')
plt.legend(['x^2', 'x^3'])
plt.show()
```

Subplot

Sometimes we want to can plot different funtions in the different plot but in the same figure, in this case we can use the `subplot` function.

```
import numpy as np
import matplotlib.pyplot as plt

# subplot(nrows, ncols, plot_number)
# Arugments are number of rows and colums of the plot
# and the active plot number

# Create the x and y coordinates
x = np.arange(-10, 10)
y1 = x**2
y2 = x**3

# Create a subplot grid with 1 row and 2 colums
# and set the active plot number to 1
plt.subplot(1, 2, 1)

# Make the first plot at the active plot
plt.plot(x, y1)
plt.title('x^2')

# Set the active plot number and make the second plot
plt.subplot(1, 2, 2)
plt.plot(x, y2)
plt.title('x^3')

# Show the figure.
plt.show()
```

Imshow

You can also use the `imshow` function to show **images**.

```
import numpy as np
from cv2 import imread
import matplotlib.pyplot as plt

img = imread('cat.jpg')

# Plot the image
plt.imshow(img)

# Imshow works better if the data is with type unit8, here we
```

```
# cast the image to uint8 explicitly.
plt.imshow(np.uint8(img))

# Show the image
plt.show()
```

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Please check the Matplotlib official website for more tutorials.