Matplotlib

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| from matplotlib import pylab as plt  import matplotlib.pyplot as plt | header |
| plt.figure() |  |
| plt.plot(x)  plt.plot(x, y)  plt.plot(x, y, 'o',)  plt.plot(x, y, ‘r’)  plt.plot(x, y, ‘ro’)  plt.plot(x, y, ‘s’)  plt.plot(x, y, ‘--’)  plt.plot(x, y, linewidth=2.0) | X is list [0, 0, 0]  X = [ 0, 0, 0] y = [0, 0, 0]  Points become “o” circle  Line with color “red”  circle points and “red”  square points  dash line |
| lines = plt.plot(x1, y1, x2, y2)  plt.setp(lines, color='r', linewidth=2.0) | Set property |
| plt.scatter(x, y)  plt.scatter('a', 'b', c='c', s='d', data=data)  plt.scatter(x, y, s=area1, marker='^', c=c)  plt.bar(x, y) | Data is a dict with  {‘a’ : value, ‘b’: value, ‘c’: value, ‘d’ : value}  From data to get:  #1 – x; #2 – y; #3 – color; #4 – size  marker ‘^’ - triangle |
| plt.title(‘title is something’)  plt.title("itr %s" %iteration) | String with variable |
| plt.draw()  plt.pause(0.5)  plt.clf() | Program would keep running  Stop 500 ms  Clear the plot |
| plt.show() | Program would suspend before close the plot viewport |
| plt.ylim([-0.5, 1])  plt.xlim([-0.5, 1]) | Limit y axis to some range  Limit x axis to some range |
| x = np.arange(10)  plt.plot(x, x)  plt.plot(x, 2 \* x)  plt.plot(x, 3 \* x)  plt.plot(x, 4 \* x)  plt.legend(['y = x', 'y = 2x', 'y = 3x', 'y = 4x'], loc='upper left') | Add legend |
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Numpy

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| Import Numpy as np | header |
| np.zeros(4)  np.zeros((2, 3)) | Output a list [0, 0, 0, 0], default is a vector  Output 2 by 3 matrix |
| X= np.array([[0,0,0],  [1,1,1],  [2,2,2]]) | Output a matrix;  X[0][0]=0;  X[1][1]=1 |
| np.linalg.inv(A) | A^-1 |
| np.dot(X, Y)  np.dot(np.linalg.inv(A), b) | Output a Matrix = Matrix X multiply matrix Y |
| Np.linspace(0, 1, 10) | list of [0 to 1] with 10 values |
| t = np.arange(0., 5., 0.2) | list of [0 to 5] with 0.2 per step |
| A=np.arange(9)  A.reshape(3,3)  A.shape=(3,3)  A.resize(3,3)  A.ravel()  A.flatten()  A.shape | List/array [0,1,2,3,4,5,6,7,8,9]  Print 3 by 3 matrix but not modify A  A becomes 3 by 3  A becomes 3 by 3  Print vector  A becomes vector  Output a tuple () |
| A[0, :]  A[1, :]  A[:, 0]  A[[0,1], :] | Array [] Row 0  Array [] Row 1  Array [] Col 0  Matrix Row 0 and Row 1 |