Python for Data Science Lab Session

Basic of Matplot

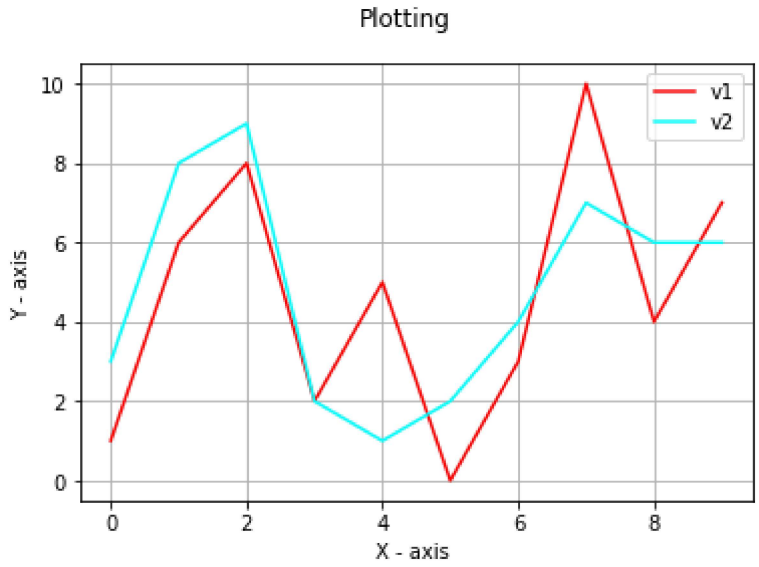
Q-1) Use Matplotlib package below tasks

In [2]:
```
v1 = [1,6,8,2,5,0,3,10,4,7]
v2 = [3,8,9,2,1,2,4,7,6,6]
```

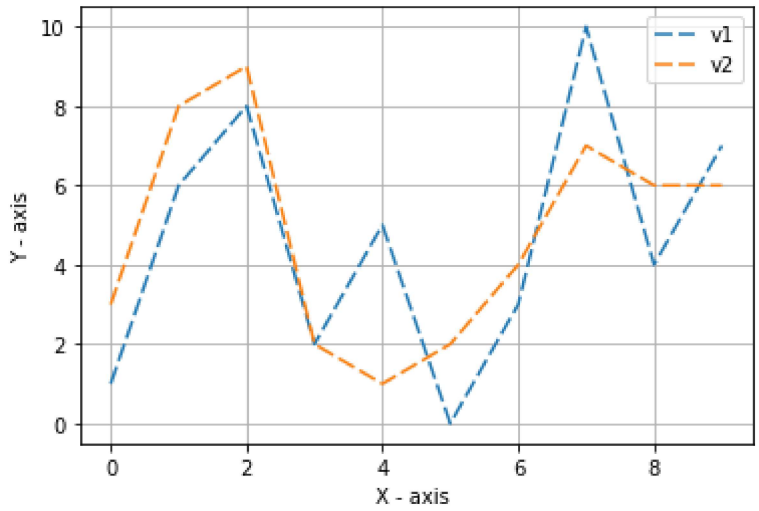
In [161]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import matplotlib
```

Q-1-> A) Plot both the values using line graph

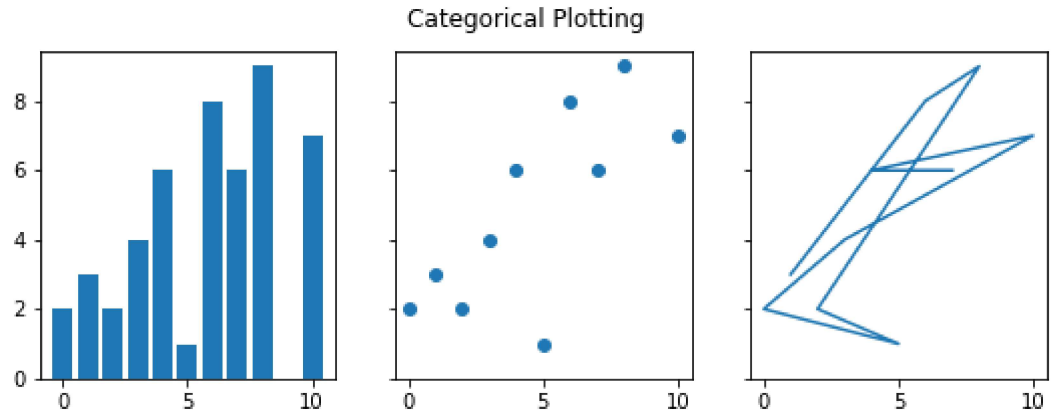
In [33]:
```
fig, axs = plt.subplots()    # It subplot the figure in array like we also giv
e more than one dimention axis (1,3 ) -> gives Three figure line by
axs.plot(v1,color='red',label='v1')

axs.plot(v2,color='cyan',label='v2')  # set color to cyan and give label
axs.legend()        # it locate the legend means (shows all the values in grap
h by it's row values)
plt.xlabel('X - axis ')  # Give the x label
plt.ylabel('Y - axis')  # Give the y label
fig.suptitle('Plotting')  # set title
plt.grid(True)   # plot  grid
plt.show()
```



In [34]:
```
fig, ax = plt.subplots()

line1, = ax.plot(v1,dashes=[6, 2], label='v1')

line2, = ax.plot(v2, dashes=[6, 2], label='v2')
plt.xlabel('X - axis ')
plt.ylabel('Y - axis')
ax.legend()
plt.grid(True)
plt.show()
```

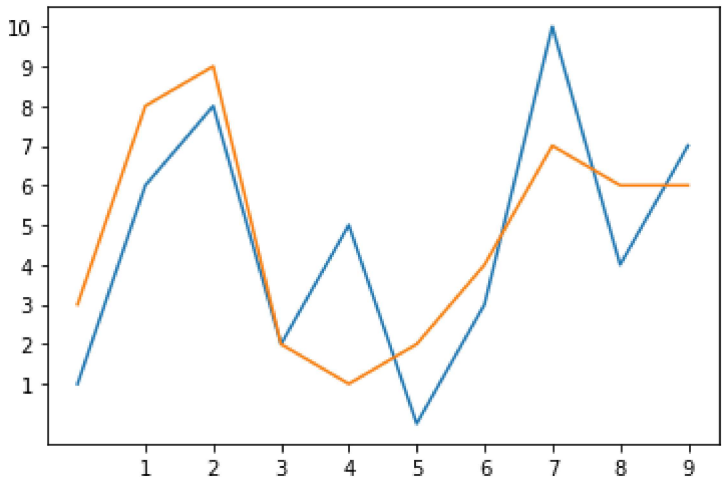


In [41]:
```
fig, axs = plt.subplots(1, 3, figsize=(9, 3), sharey=True)  #sharey use for si
milar data in all diffrent type visulization Where x axis comman
fig.suptitle('Categorical Plotting')

axs[0].bar(v1,v2)
axs[1].scatter(v1,v2)
axs[2].plot(v1,v2)  # here x and y axis is needed that why just for practise

plt.show()
```



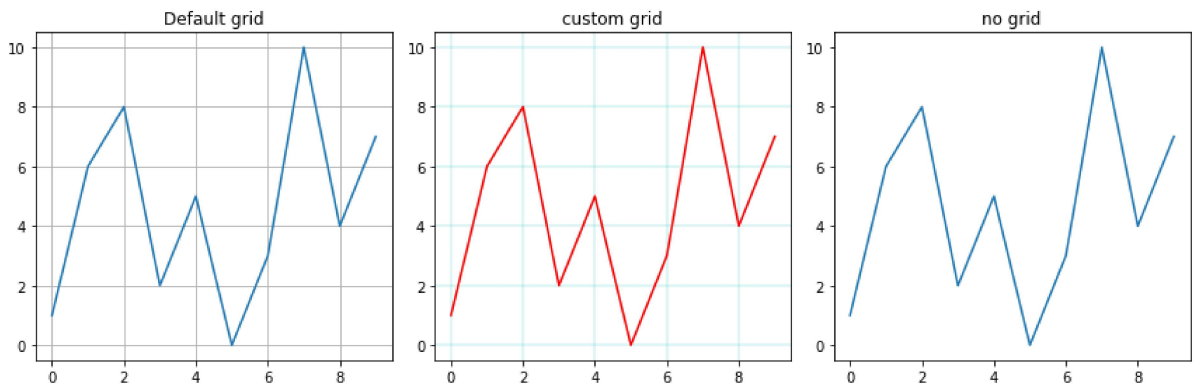
Q-1 -> B) Change the axes limit and ticks and observe the result

In [60]:
```
fig, ax = plt.subplots()
ax.set_xticks([1,2,3,4,5,6,7,8,9,10])  # here we assige x and y values
ax.set_yticks([1,2,3,4,5,6,7,8,9,10])
ax.plot(v1)
ax.plot(v2)

plt.show()
```



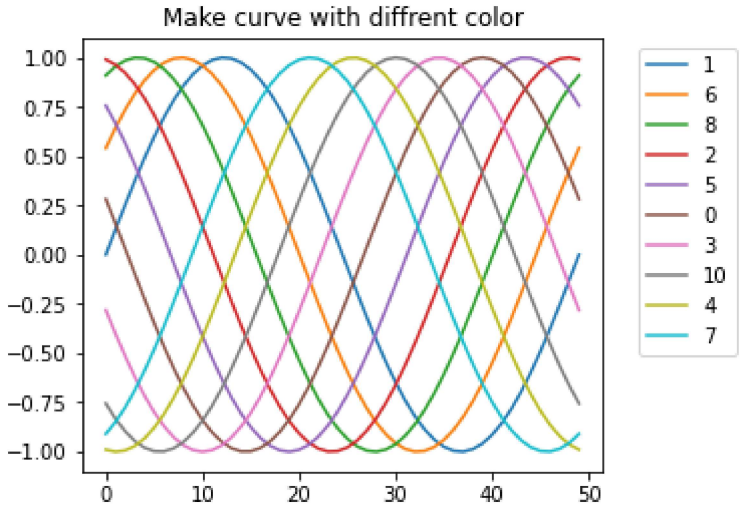
Q-1 -> C) Observe the resulting image grid in plot

In [76]:
```
fig, axes = plt.subplots(1,3, figsize = (12,4))

axes[0].plot(v1)
axes[0].grid(True)
axes[0].set_title('Default grid')

axes[1].plot(v1, 'r')
axes[1].grid(color='c', lw = 0.25) #lw for light opecity
axes[1].set_title('custom grid')

axes[2].plot(v1)
axes[2].set_title('no grid')

fig.tight_layout()
plt.show()
```



Q-1 -> D) Use lines of diffrent color to represent each values

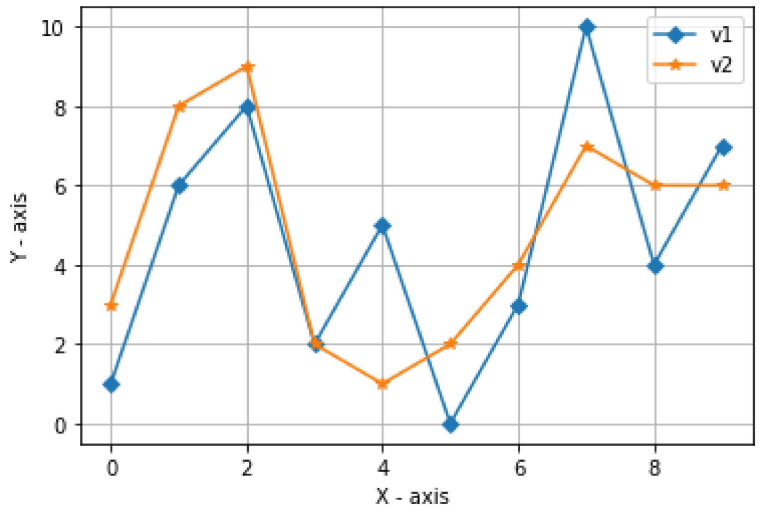
In [91]:
```
colors = ['#1f77b4',
          '#ff7f0e',
          '#2ca02c',
          '#d62728',
          '#9467bd',
          '#8c564b',
          '#e377c2',
          '#7f7f7f',
          '#bcbd22',
          '#17becf',
          '#1a55FF']


fig = plt.figure()
ax = fig.add_axes([0.1, 0.1, 0.6, 0.75])

x = np.linspace(0, 2 * np.pi)
offsets = np.linspace(0, 2 * np.pi, 11, endpoint=False)
yy = np.transpose([np.sin(x + phi) for phi in offsets])

for i in range(len(v1)):
    ax.plot(yy[:, i], label=str(v1[i]))
    ax.legend(bbox_to_anchor=(1.05, 1) )

plt.title('Make curve with diffrent color')

plt.show()
```



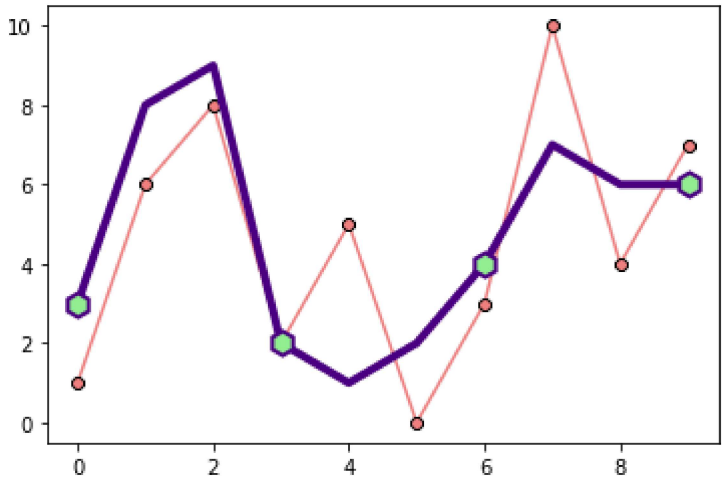
In [ ]:

Q-1 -> E) Use diffrent markers for both the lines

In [117]:
```
fig, ax = plt.subplots()

line1, = ax.plot(v1,marker='D', label='v1') #use Marker function

line2, = ax.plot(v2, marker='*', label='v2')
plt.xlabel('X - axis ')
plt.ylabel('Y - axis')
ax.legend()
plt.grid(True)
plt.show()
```



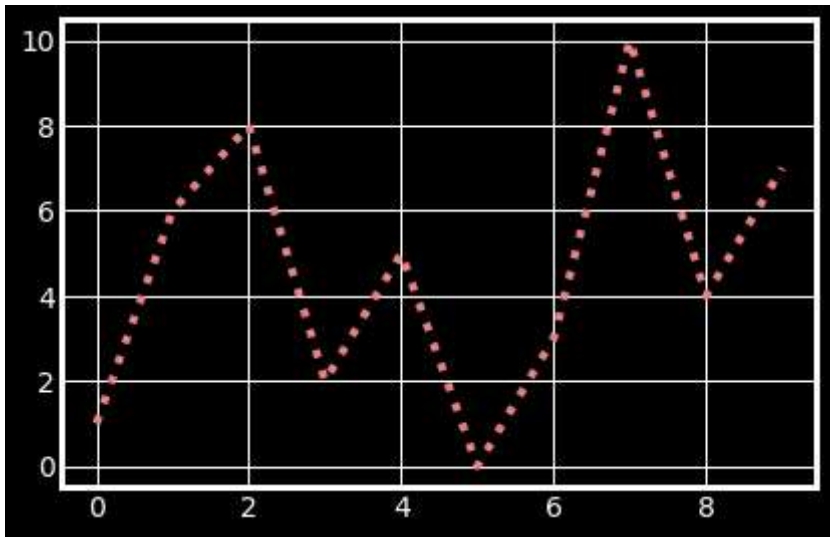
In [126]:
```
plt.plot(v1, color='lightcoral', marker='8', markeredgecolor='black')

plt.plot(v2 ,color='#4b0082', linewidth=4,marker='h', markerfacecolor='lightgr
een', markeredgewidth=2,markersize=12, markevery=3)

plt.show()
```



Q-1 -> F) Use diffrent lines styles to represent both lines

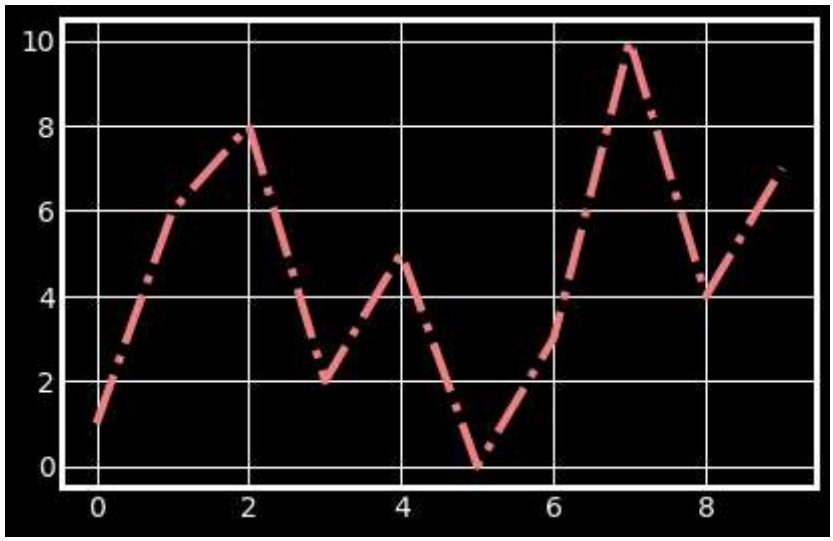
In [150]:
```
plt.plot(v1, color='lightcoral', linestyle=':')
```

Out[150]:
```
[<matplotlib.lines.Line2D at 0x1501e2ce7b8>]
```



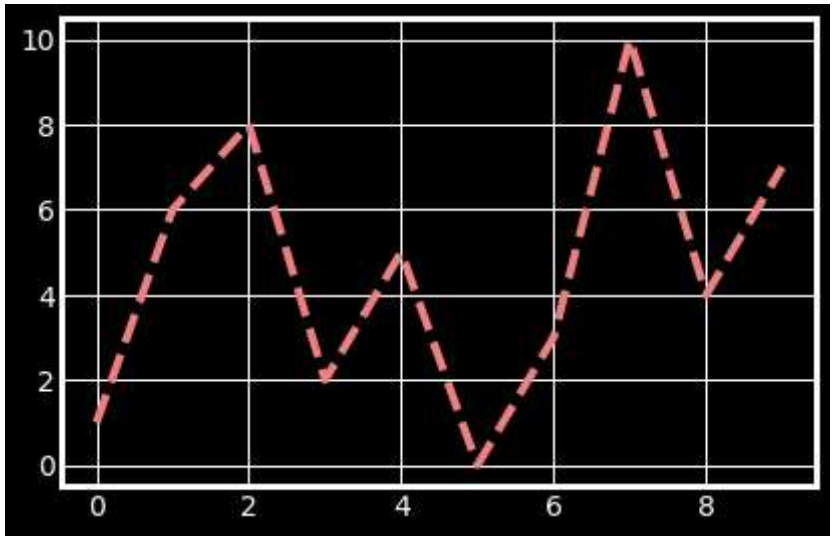
In [151]:
```
plt.plot(v1,color='lightcoral', linestyle='-.')
```

Out[151]:
```
[<matplotlib.lines.Line2D at 0x1501d07ae80>]
```



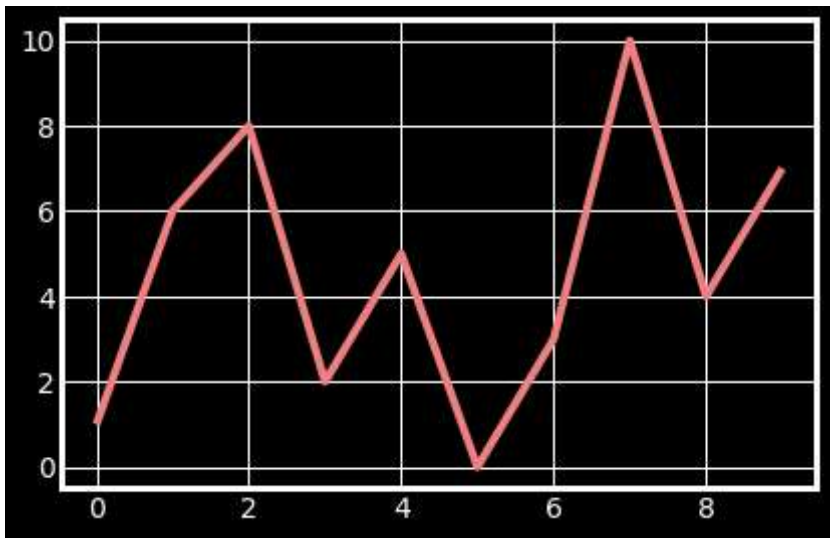
In [153]:
```
plt.plot(v1,color='lightcoral', linestyle='--')
```

Out[153]:
```
[<matplotlib.lines.Line2D at 0x1501e535128>]
```

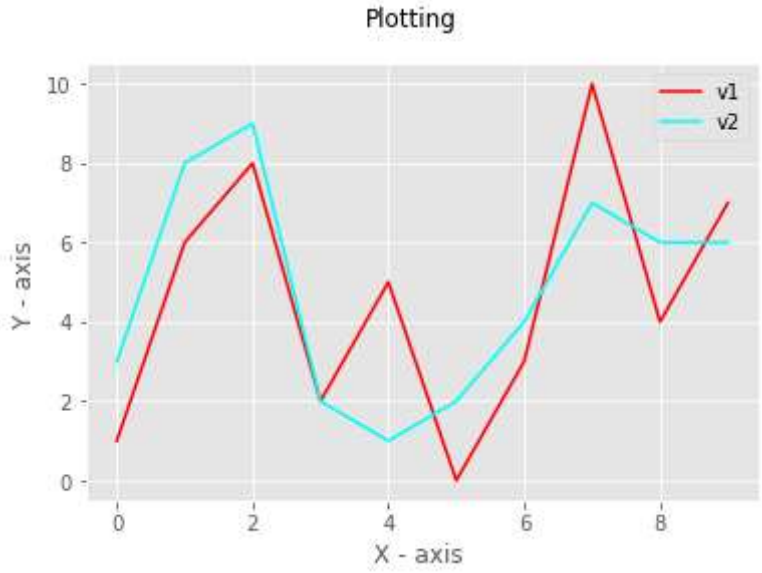


In [156]:
```
plt.plot(v1,color='lightcoral', linestyle='solid')
```

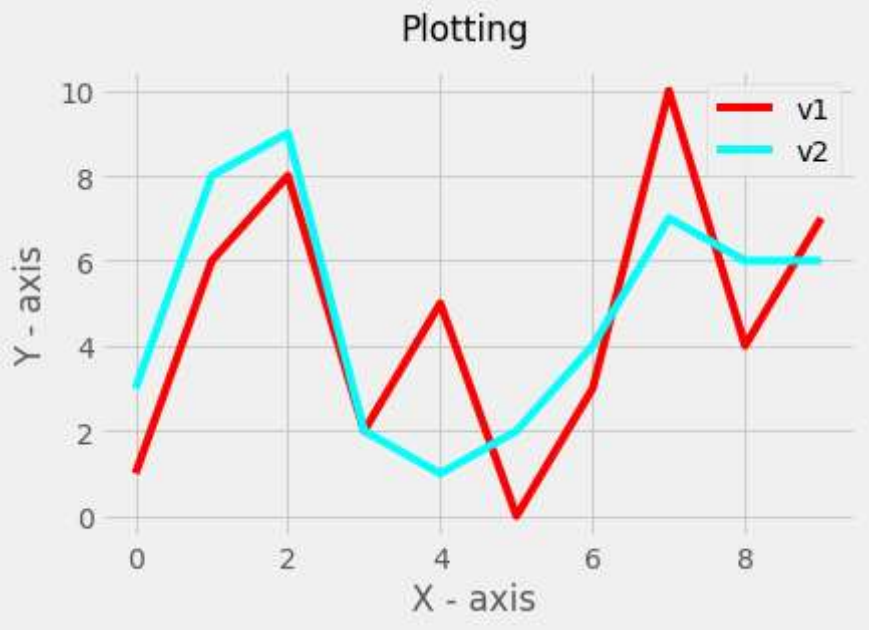
Out[156]:
```
[<matplotlib.lines.Line2D at 0x1501ce1a240>]
```



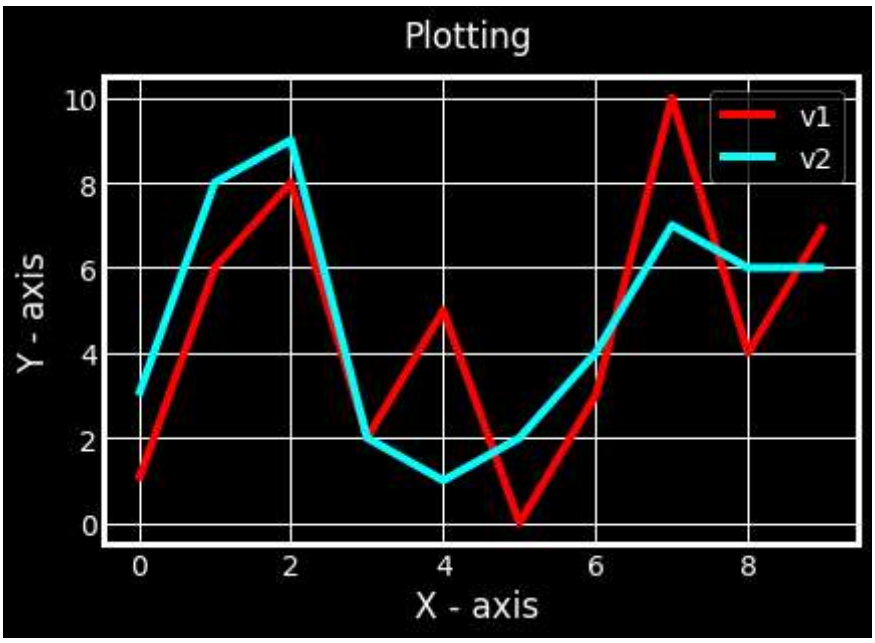
In [141]:
```
from matplotlib import style
style.use('ggplot')
fig, axs = plt.subplots()    # It subplot the figure in array like we also giv
e more than one dimention axis (1,3 ) -> gives Three figure line by
axs.plot(v1,color='red',label='v1')

axs.plot(v2,color='cyan',label='v2')  # set color to cyan and give label
axs.legend()        # it locate the legend means (shows all the values in grap
h by it's row values)
plt.xlabel('X - axis ')  # Give the x label
plt.ylabel('Y - axis')  # Give the y label
fig.suptitle('Plotting')  # set title
plt.grid(True)   # plot  grid
plt.show()
```



In [142]:
```
style.use('fivethirtyeight')
fig, axs = plt.subplots()    # It subplot the figure in array like we also giv
e more than one dimention axis (1,3 ) -> gives Three figure line by
axs.plot(v1,color='red',label='v1')

axs.plot(v2,color='cyan',label='v2')  # set color to cyan and give label
axs.legend()        # it locate the legend means (shows all the values in grap
h by it's row values)
plt.xlabel('X - axis ')  # Give the x label
plt.ylabel('Y - axis')  # Give the y label
fig.suptitle('Plotting')  # set title
plt.grid(True)   # plot  grid
plt.show()
```



In [145]:
```
style.use('dark_background')
fig, axs = plt.subplots()    # It subplot the figure in array like we also giv
e more than one dimention axis (1,3 ) -> gives Three figure line by
axs.plot(v1,color='red',label='v1')

axs.plot(v2,color='cyan',label='v2')  # set color to cyan and give label
axs.legend()        # it locate the legend means (shows all the values in grap
h by it's row values)
plt.xlabel('X - axis ')  # Give the x label
plt.ylabel('Y - axis')  # Give the y label
fig.suptitle('Plotting')  # set title
plt.grid(True)   # plot  grid
plt.show()
```



Q-1 -> G) Save work in image in hard drive

In [160]:
```
fig.savefig('plot.png') # it save last image
```

In [169]:
```
import matplotlib.image as mpimg
plt.imshow(mpimg.imread('plot.png'))
```

Out[169]: <matplotlib.image.AxesImage at 0x1501cc74438>