Problem statement: Write a python programme to calculate reaction, shear force and bending moment values for Cantilever beam of length L and carrying uniformly distribute load w. and also plot SFD and BMD. Take L= 4m w=10kN/m

```
import numpy as np
L=4.0
w=10.0
print('L=',L,'m; w = ',w,'kN/m')
vb=w*L # vb is vertical reaction at B
print('vb=',vb,'kN')
xx=np.linspace(0,L,5)
sf=np.zeros(xx.shape,dtype=float)
bm=np.zeros(xx.shape,dtype=float)
datum=np.zeros(xx.shape,dtype=float)
for i in range(len(xx)):
   sf[i]=-w*xx[i]
   bm[i]=-w*xx[i]**2.0/2.0
print("xx=",xx)
print('sf=',sf)
print('bm=',bm)
import matplotlib.pyplot as plt
plt.subplot(311)
plt.plot(xx,sf,'r-',label='sf')
plt.plot(xx,datum,'g-',label='datum')
plt.legend()
```

```
plt.grid()
plt.xlabel('distance x in m')
plt.ylabel('SF in kN')
plt.title('SFD')
plt.subplot(313)
plt.plot(xx,bm,'b-',label='bm')
plt.plot(xx,datum,'g-',label='datum')
plt.legend(loc=5)
plt.grid()
plt.xlabel('distance x in m')
plt.ylabel('BM in kN-m')
plt.title('BMD')
```

OUTPUT

L= 4.0 m; w = 10.0 kN/m

vb= 40.0 kN

xx= [0. 1. 2. 3. 4.]

sf= [-0. -10. -20. -30. -40.]

bm= [-0. -5. -20. -45. -80.]

SFD AND BMD