Problem statement: Write a python programme to calculate reaction, shear force and bending moment values for simply supported beam of length L and carrying uniformly distribute load w. and also plot SFD and BMD. Take L= 6m w=20kN/m

```
import numpy as np
L=6; w=20
print('L=',L,'m') # prints value of L
print('w=',w,'kN/m') # prints value of w
Ra=w*L/2; Rb=Ra  # Equation for finding reaction
print('Ra=',Ra,'kN') # prints value of reaction va
print('Rb=',Rb,'kN') # prints value of reaction vb
x=np.linspace(0,L,7)
sf=np.zeros(x.shape,dtype=float)
bm=np.zeros(x.shape,dtype=float)
datum=np.zeros(x.shape,dtype=float)
for i in range(len(x)):
   sf[i]=Ra-w*x[i]
   bm[i]=Ra*x[i]-w*x[i]**2/2
print('sf=',sf)
print('bm=',bm)
```

```
# for plotting graph
import matplotlib.pyplot as plt
# code for ploting SFD
plt.subplot(311)
plt.plot(x,sf,'r-',label='sf')
plt.plot(x,datum,'g-',label='datum')
plt.legend()
plt.grid()
plt.xlabel('distance x in m')
plt.ylabel('SF in kN')
plt.title('SFD')
# for ploting BMD
plt.subplot(313)
plt.plot(x,bm,'b-',label='bm')
plt.plot(x,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')
```

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L= 6 m

w= 20 kN/m

Ra= 60.0 kN

Rb= 60.0 kN

sf= [60. 40. 20.   0. -20. -40. -60.]

bm= [0. 50. 80. 90. 80. 50. 0.]

SFD and BMD