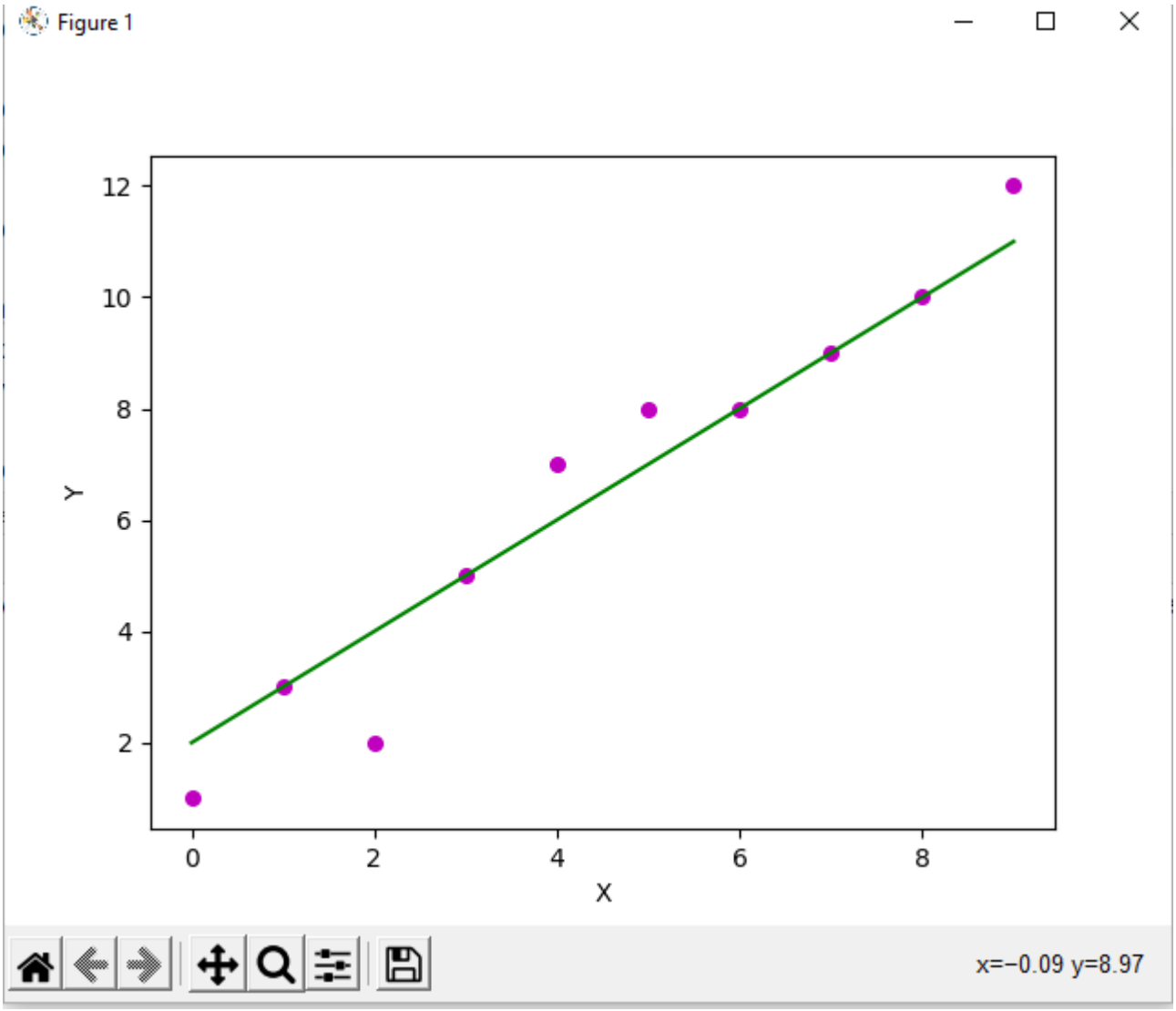
PROGRAM NO : 8

AIM : Program to implement linear and multiple regression techniques using any standard dataset available in the public domain and evaluate its performance (Using Without Builtin Function)

PROGRAM

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

def estimate_coef(x,y):

    n=np.size(x)

    m_x=np.mean(x)
    m_y=np.mean(y)

    SS_xy=np.sum(y*x) - n * m_y * m_x
    SS_xx=np.sum(x*x) - n * m_y * m_x

    b_1 = SS_xx / SS_xx
    b_0 = m_y - b_1 * m_x
    #plot_regression_line()
    return  (b_0,b_1)

def plot_regression_line(x, y, b):

    plt.scatter(x, y, color = "m", marker= "o",s=30)

    y_pred = b[0] + b[1] * x

    plt.plot(x, y_pred, color="g")

    plt.xlabel('X')
    plt.ylabel('Y')

    plt.show()

def main():
    x=np.array([0,1,2,3,4,5,6,7,8,9])
    y=np.array([1,3,2,5,7,8,8,9,10,12])

    b=estimate_coef(x,y)
    print("Estimated Coeffiecnts : \n b_0 ={} \n  b_1 ={}
".format(b[0],b[1]))

    plot_regression_line(x,y,b)

if __name__ == "__main__":
    main()
```

OUTPUT




```
C:\Users\ajcemca\AppData\Local\Programs\Python\Python39\python.exe
Estimated Coeffiecnts :
 b_0 =2.0
  b_1 =1.0
```