Program No:8

Program to implement linear regression techniques and plot the values(Without Using inBuilt 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_x * m_x
    b_1 = SS_xy / 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([11,16,6,8,10,12])
    y = np.array([14,25,18,20,22,24])
    b = estimate_coef(x, y)
    print("estimated coefficient : \nb_0 ={} \ \nb_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 C:/Users/ajcemca/PycharmProjects/naivebaised/LinearRegressionWtot.
estimated coefficient :
b_0 =13.705882352941176
b_1 = 0.6470588235294118
```

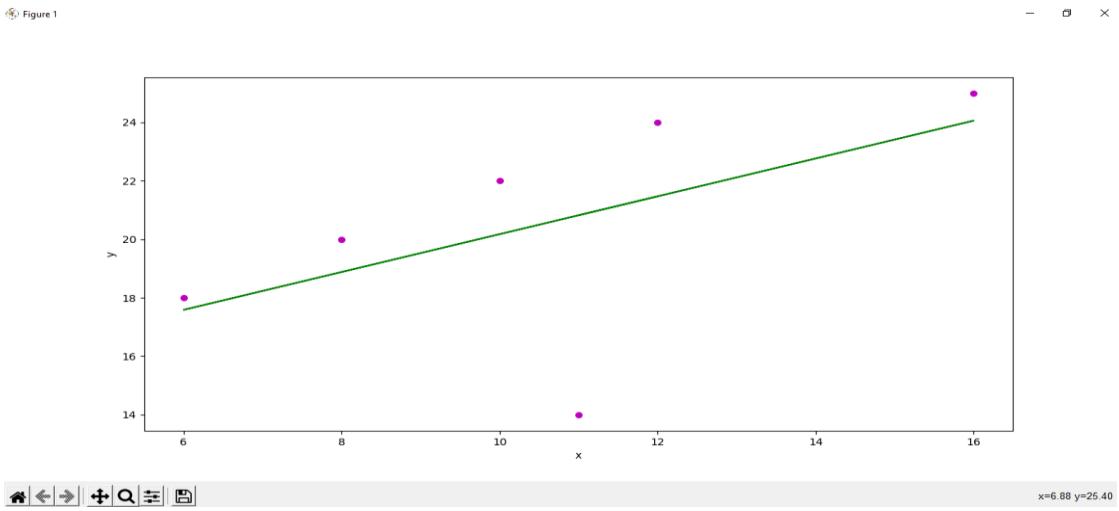
Figure 1
24
22
20
18
16
14
y
6
8
10
12
14
16
x
x=6.88 y=25.40