

CODE :

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

def estimate_coef(x, y):
    n = np.size(x) # number of observations/points
    m_x, m_y = np.mean(x), np.mean(y) # mean of x and y
    vector
    # calculating cross-deviation and deviation about x
    SS_xy = np.sum(y*x) - n*m_y*m_x
    SS_xx = np.sum(x*x) - n*m_x*m_x
    # calculating regression coefficients
    b_1 = SS_xy / SS_xx
    b_0 = m_y - b_1*m_x
    return(b_0, b_1)

def plot_regression_line(x, y, b):
    # plotting the actual points as scatter plot
    plt.scatter(x, y, color = "m",
               marker = "o", s = 30)
    # predicted response vector
    y_pred = b[0] + b[1]*x
    # plotting the regression line
    plt.plot(x, y_pred, color = "g")
    # putting labels
    plt.xlabel('x')
    plt.ylabel('y')
    plt.show() # function to show plot

def main():

    data = py.read_csv("linear.csv") #reading table data from
    csv file
    x = data['x']
    y = data['y']
    b = estimate_coef(x,y) # estimating coefficients
    print("Estimated coefficients:\nb_0 = {} \
        \nb_1 = {}".format(b[0], b[1]))
    plot_regression_line(x,y,b) # plotting regression line
if __name__ == "__main__":
    main()
```

Input for the code –

#linear.csv

```
x,y
10,95
9,80
2,10
15,50
```

10,45
16,98
11,38
16,93

OUTPUT :

Estimated coefficients:

$b_0 = 12.584627964$

$b_1 = 4.58789860998$