1BM18CS156
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→ Linear Regression Algorithm in order to fit data points

(4)

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

def estimate_coefficient(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

    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([43, 21, 25, 42, 57, 59])
    y = np.array([95, 65, 79, 75, 87, 81])

    b = estimate_coefficient(x, y)

    print("The estimated coefficients are :\nb_0 = {}
          \nb_1 = {}".format(b[0], b[1]))

    new_x = np.append(x, [55])
    unknown_y = (b[0] + 55 * b[1])

    new_y = np.append(y, [unknown_y])
    print("X: 55, Y: ", unknown_y)
    plot_regression_line(new_x, new_y, b)

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