

Program No :- 7

Aim :- Program to implement linear and multiple regression techniques using any standard dataset available in the public domain and evaluate its performance (without using inbuilt function).

Program Code

```
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
    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([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])
    y = np.array([1, 3, 2, 5, 7, 8, 9, 10, 12])
    b = estimate_coef(x, y)
    print("Estimated coefficients:\nb_0 = { } \
        \nb_1 = { }".format(b[0], b[1]))
    plot_regression_line(x, y, b)
```

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

Output

