1. **Objective**: Introduce the basic concept of linear regression and its' application in fitting a line to a set of data points.

2. **Problem Statement:** Marks obtained by 10 university students in their college test and university test are provided in the following table. Estimate the marks may obtain by a student in the university test when the student has obtained 150 in college test using linear regression.

Sl. No.	College Test	University Test
1	183	433
2	175	393
3	134	270
4	170	364
5	144	346
6	183	399
7	167	360
8	114	361
9	125	319
10	187	376

3. **Model Development:** Given the linear equation form of $y = f(x) = mx + b$,

   i. Calculate the slope (m) and intercept (b) using the following formulae:

   $$m = \frac{n \sum xy - \sum x \sum y}{n \sum x^2 - (\sum x)^2}$$

   $$b = \frac{\sum y - m \sum x}{n}$$

   ii. Plot the regression model using *matplotlib* for the given values of x and y.

4. **Model Evaluation:**

   i. Calculate the predicted values of $f_p(x)$ for each of the given input x based on the obtained linear model and compute the mean squared error between the values of given $f(x)$ and predicted $f_p(x)$.

   ii. Generate $f_p(x)$ using $f_p(x) = mx + b$. Plot the linear regression model $f_p(x) = mx + b$ using *matplotlib* for the values x of and $f_p(x)$.

   iii. For the unknown value of $x = 150$, find the value of $f_p(x)$. Plot the obtained value in the graph using a different color.