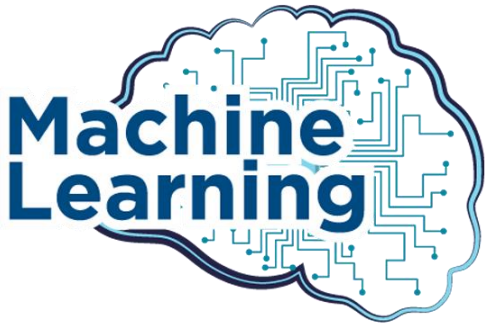
Siddhardhan

Linear Regression - intuition

Machine Learning



Data

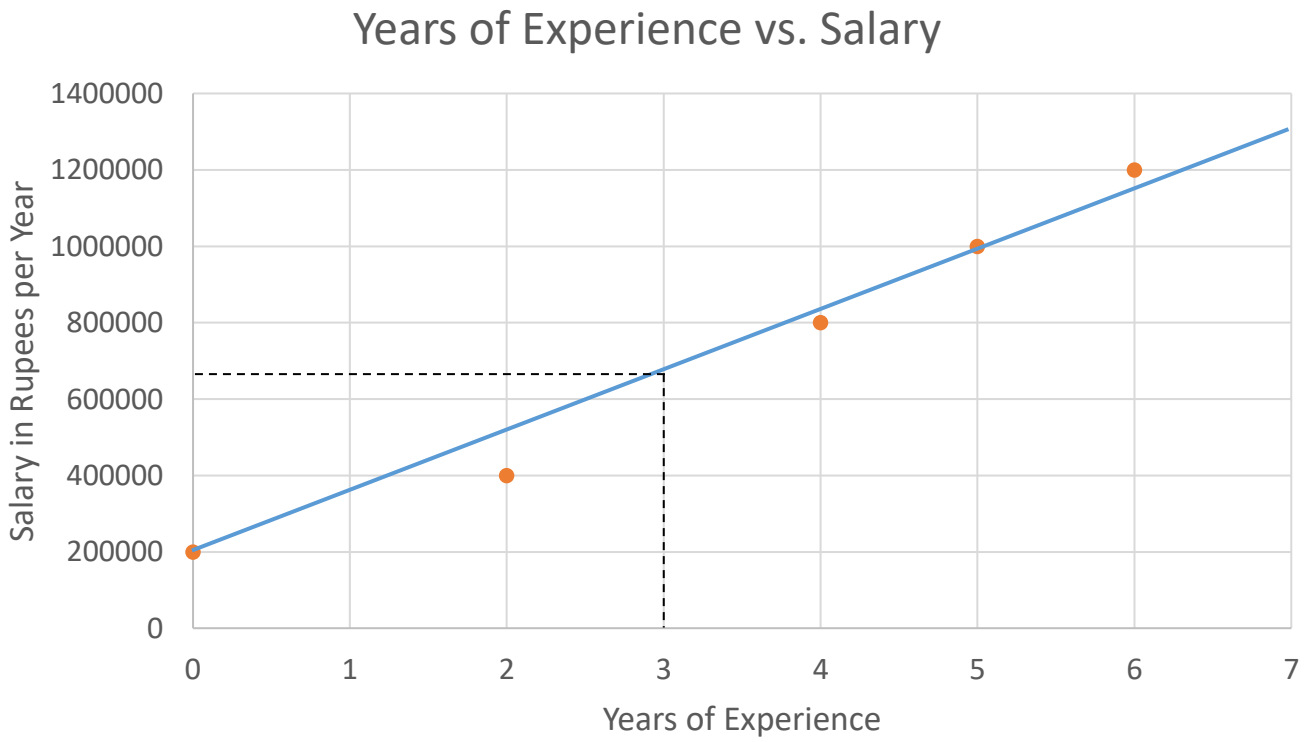
Machine Learning model

Linear Regression

Experience in Years	0	2	4	5	6
Salary	2,00,000	4,00,000	8,00,000	10,00,000	12,00,000

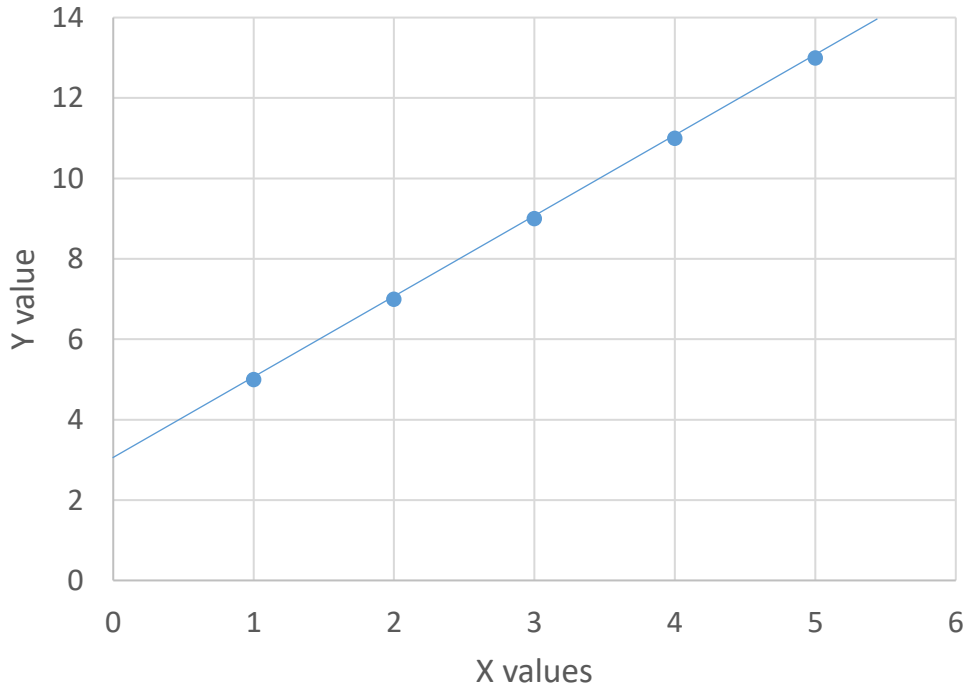
What would be the **salary** of a person with **3 years of Experience?**

~ ₹ 650000 per Year



Linear Regression

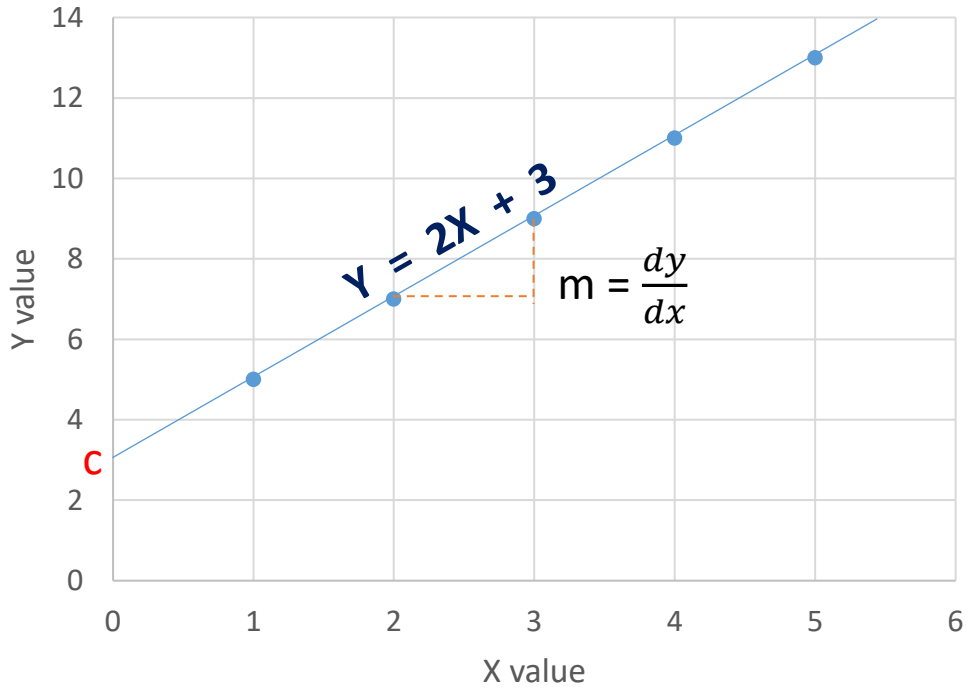
X	1	2	3	4	5
Y	5	7	9	11	13



$Y = mX + c$

X --> X value
Y --> Y value
m --> Slope
c --> Intercept

Linear Regression



Inference: The above Line equation is a function that relates X and Y.
For a given value of X, we can find the corresponding value of Y

Equation of a Straight Line : **Y = mX + c**

Find the values of m and c:

Point P1 (2,7)
Point P2 (3,9)

Slope, m = $\frac{y_2 - y_1}{x_2 - x_1} = \frac{9 - 7}{3 - 2} = 2$

m = 2

Intercept, c:

Point (4,11)

Y = 2X + c

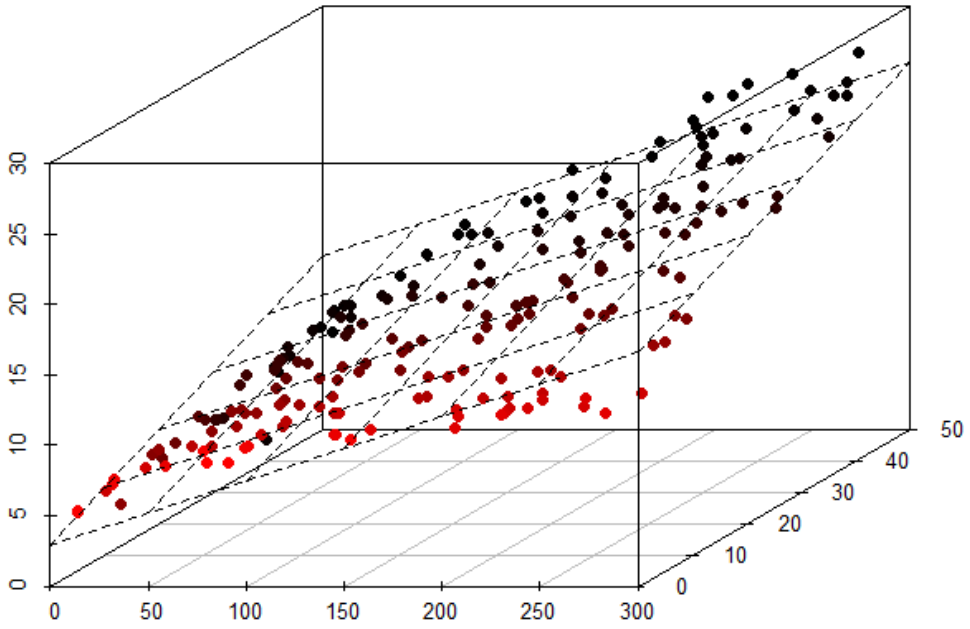
11 = 2(4) + c

c = 3

What if there are more than 2 Variables?

Multiple Linear Regression

Multiple linear regression is a model for predicting the value of one dependent variable based on two or more independent variables.



Simple Linear Regression

$$y = b_0 + b_1 * x_1$$

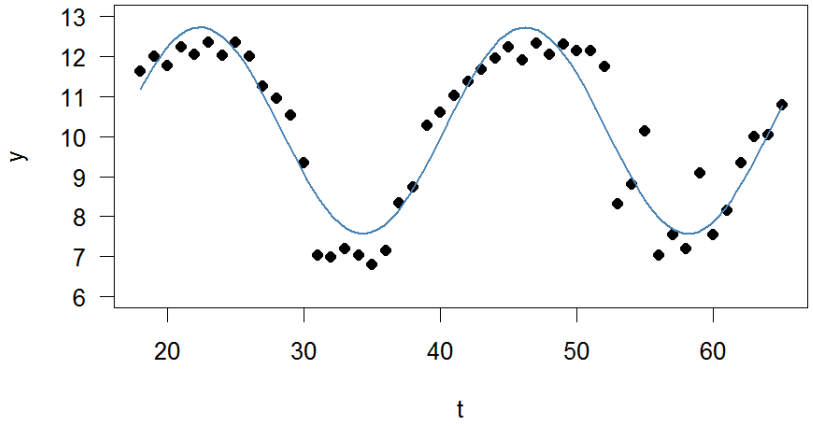
Multiple Linear Regression

$$y = b_0 + b_1 * x_1 + b_2 * x_2 + \ldots + b_n * x_n$$

Linear Regression

Advantages:

1. Very simple to implement
2. Performs well on data with linear relationship



Disadvantages:

1. Not suitable for data having non-linear relationship
2. Underfitting issue
3. Sensitive to Outliers