



Linear Regression

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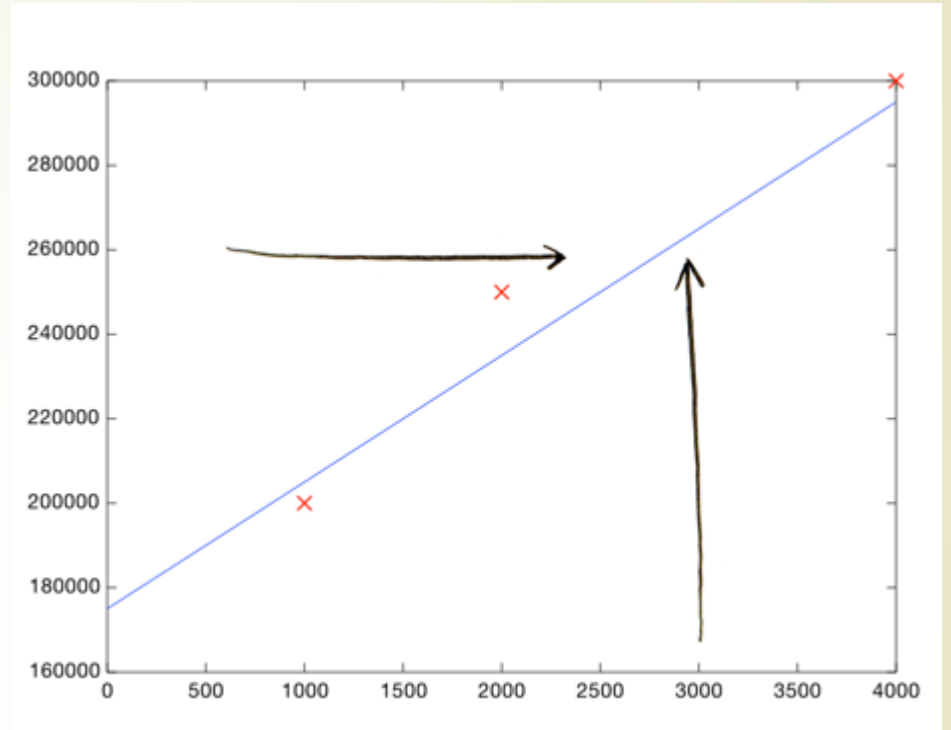
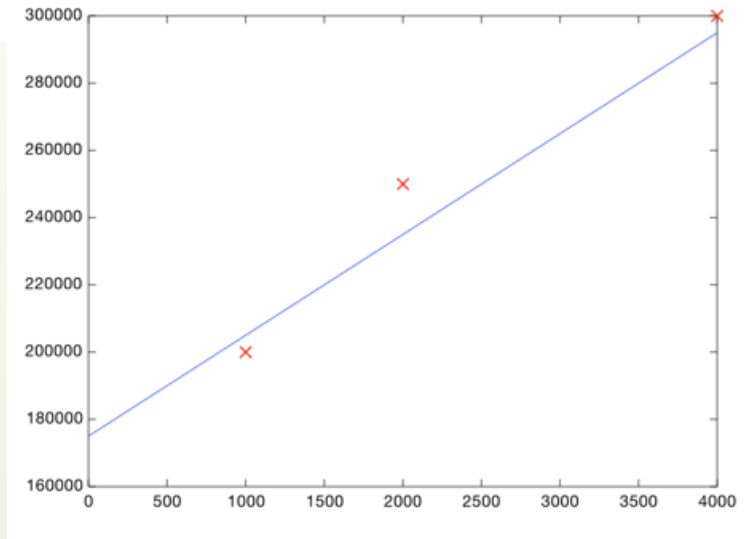
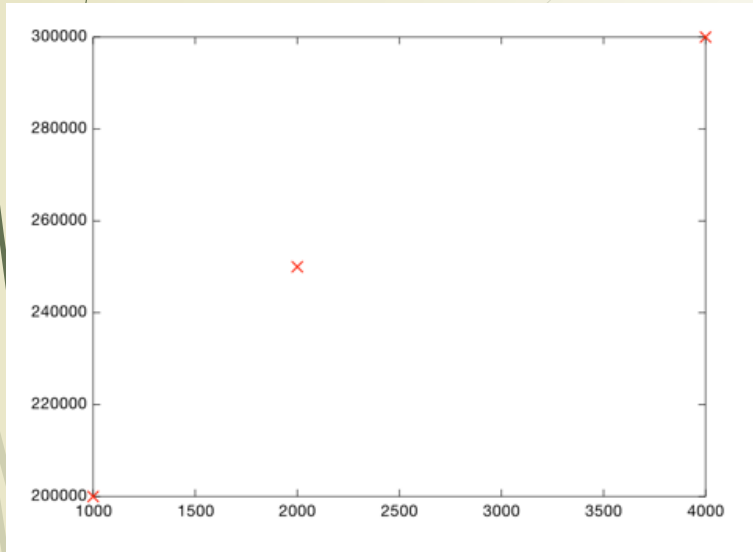
What is Linear Regression ?



Suppose we are selling our house/property

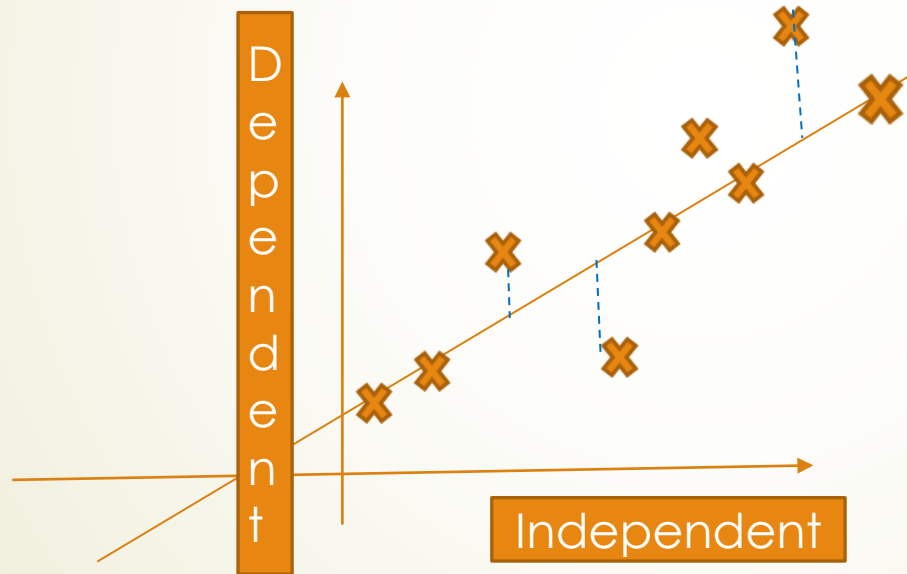


But your house size is 3000 SqFt



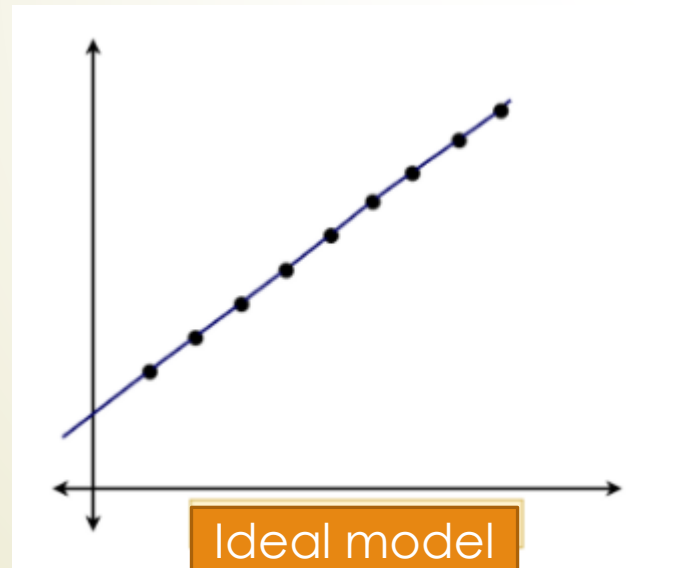
What is Linear Regression ?

- Supervised learning model
- Aims to fit a line which best fits the model and thus used for regression datasets
- Eg: Predicting the price of the house, forecasting



Working

- ▶ Best fit line means that total distance of a data point from the linear model should be minimal.
- ▶ Distance= Error
- ▶ Straight line equation : $Y=mX+C$
- ▶ X =Independent variable Y =Dependent variable m =Slope of the line
 C = Y intercept



Cost Function:

- Determines how the model is working.
- Simply it's sum of all the errors.

FOR A GIVEN THETA 0 AND THETA 1...

2. FIND THE DIFFERENCE BETWEEN THE PREDICTED AND ACTUAL VALUES

1. THE PREDICTED VALUE

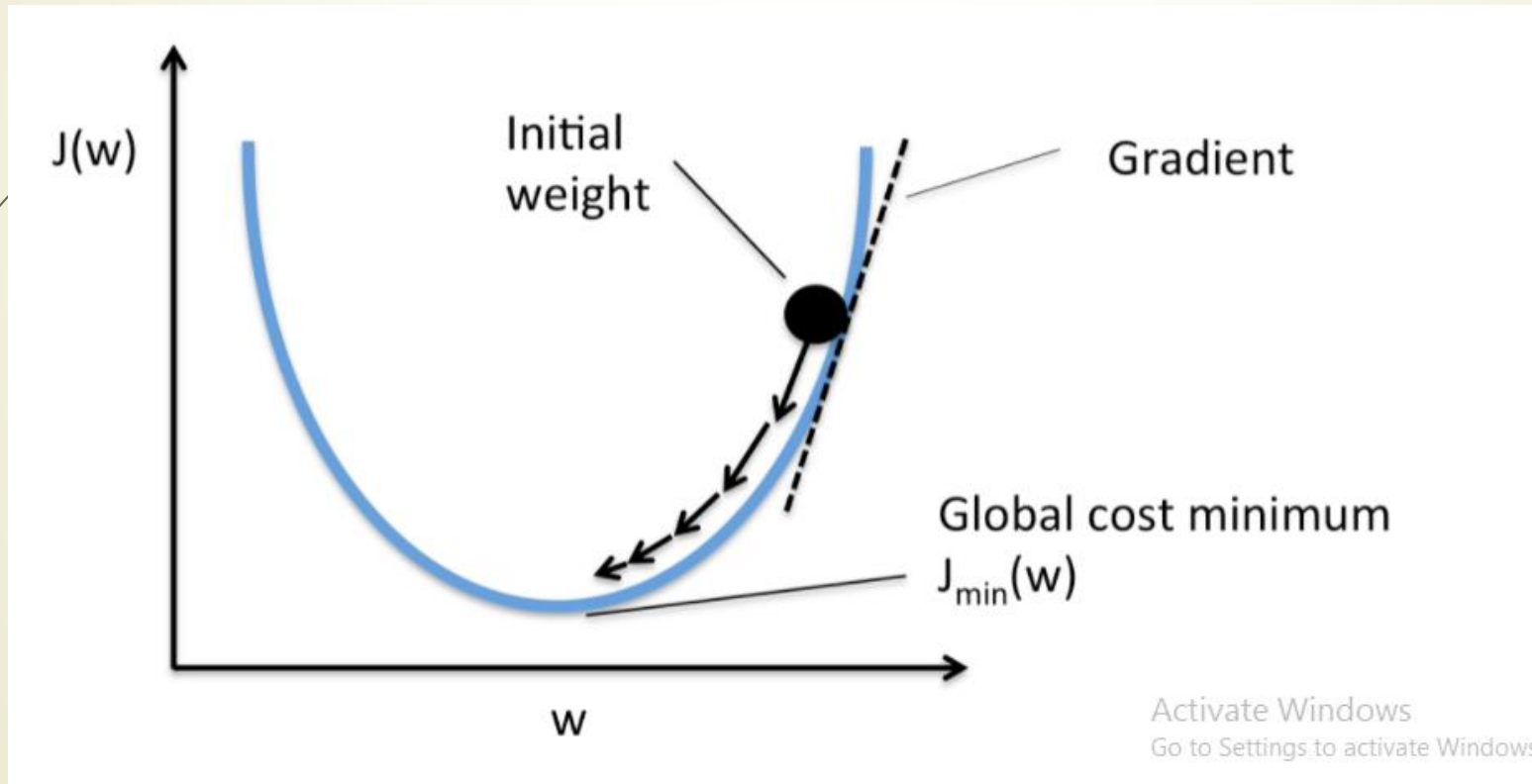
$$J(\theta_0, \theta_1) = \frac{1}{2m} \sum_{i=1}^m (h_{\theta}(x^i) - y^i)^2$$

4. FIND THE AVERAGE

3. FIND **ALL** THE DIFFERENCES BETWEEN PREDICTED AND ACTUAL

Gradient Descent

- Helps in minimizing the cost function





Applications:

- Financial Forecasting
 - House Rent prediction
 - Weather forecasting
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