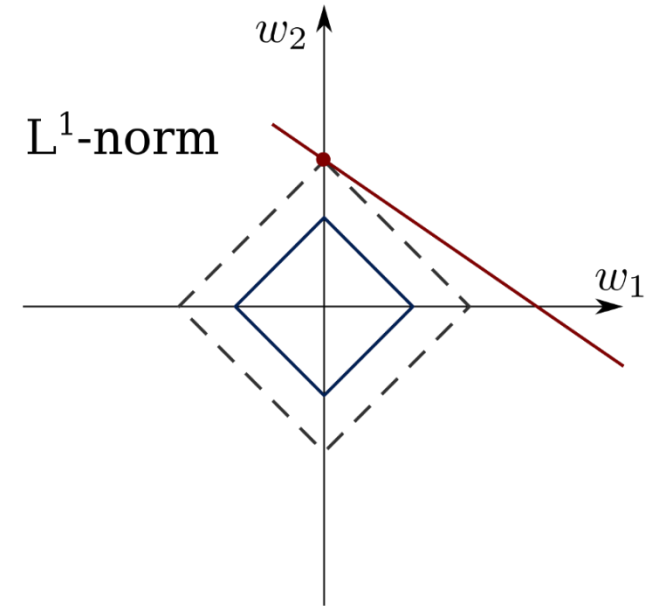


Siddhardhan

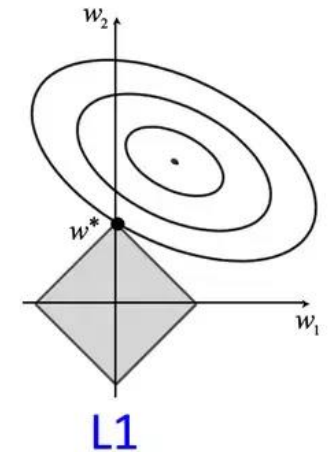
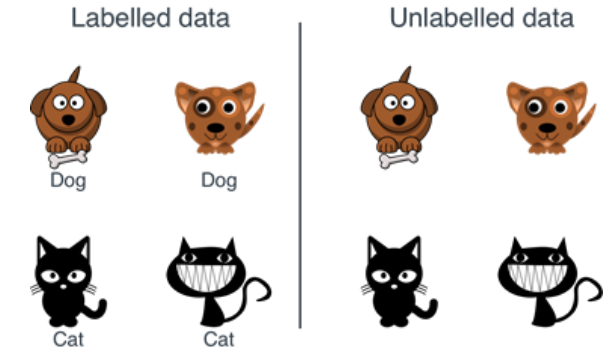
Lasso Regression - intuition



Lasso Regression

About Lasso Regression:

1. Supervised Learning Model
2. Regression model
3. **L**east **A**bsolute **S**hrinkage and **S**election **O**perator
4. Implements Regularization (L1) to avoid Overfitting

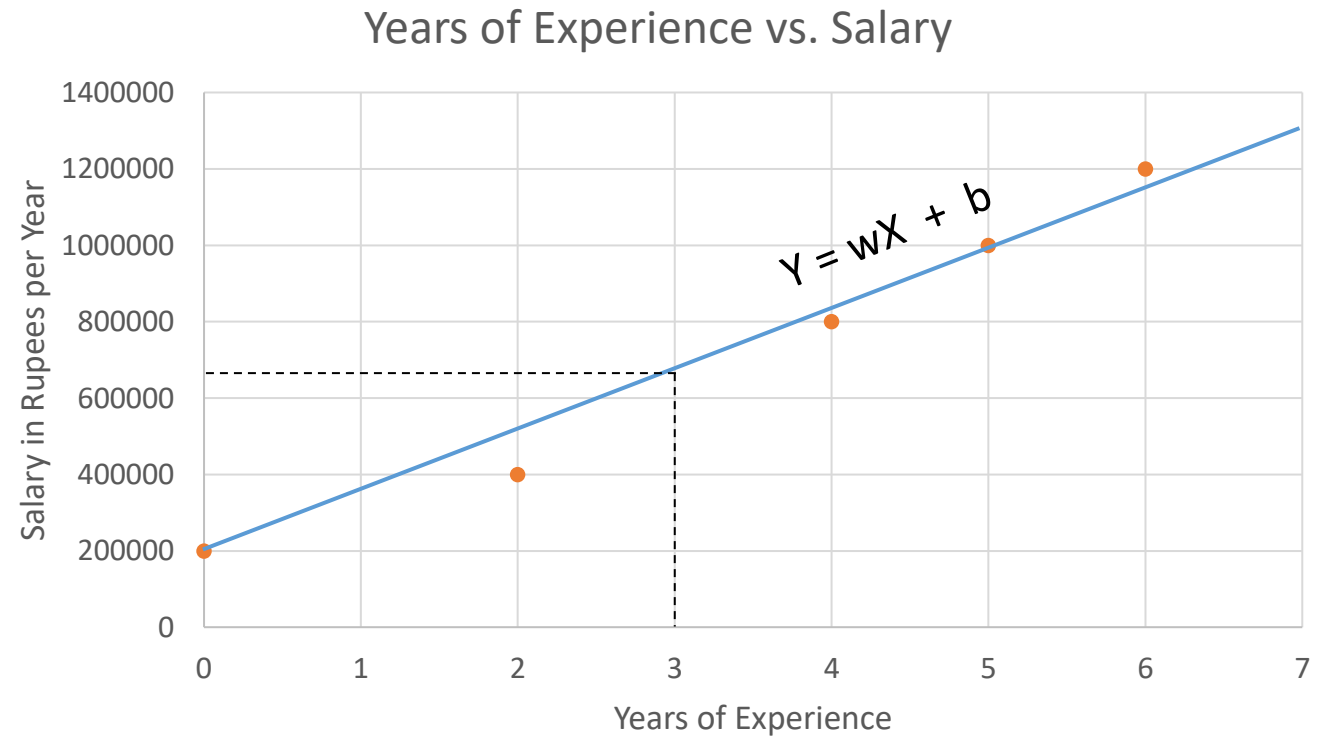


Linear Regression

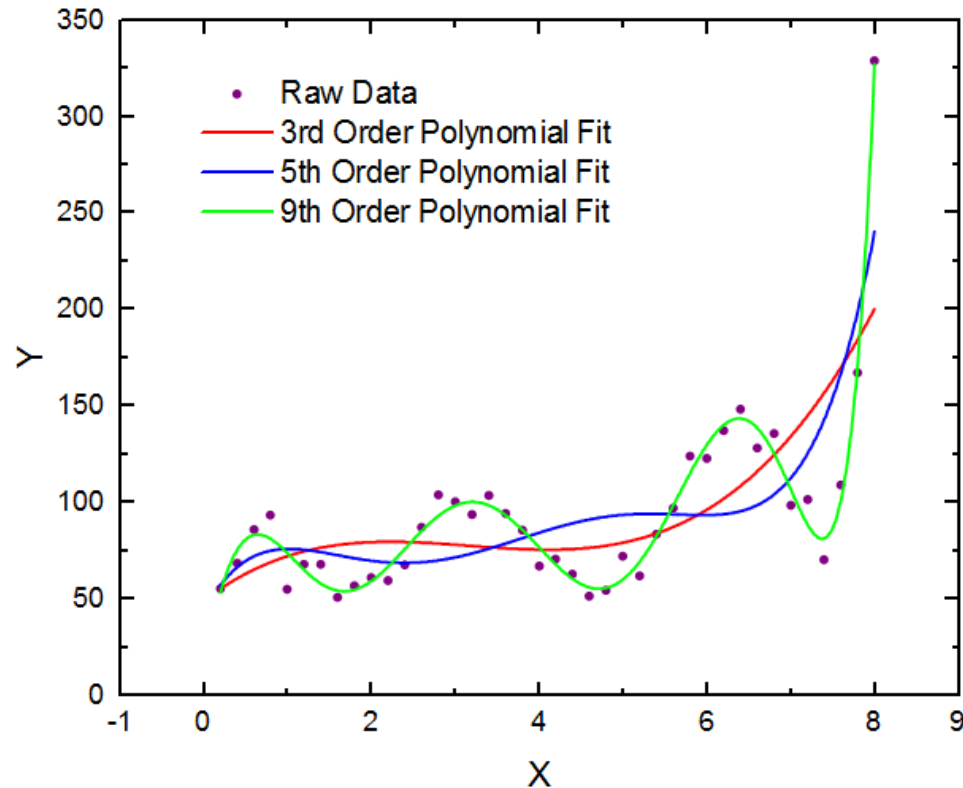
Experience in Years	0	2	4	5	6
Salary	2,00,000	4,00,000	8,00,000	10,00,000	12,00,000

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

~ ₹ 650000 per Year



Polynomial Equations



1st order Polynomial equation : $y = ax + d$

2nd order Polynomial equation : $y = ax^2 + bx + d$

3rd order Polynomial equation : $y = ax^3 + bx^2 + cx + d$

y --> Dependent Variable

x --> Independent Variable

a, b, c --> coefficients

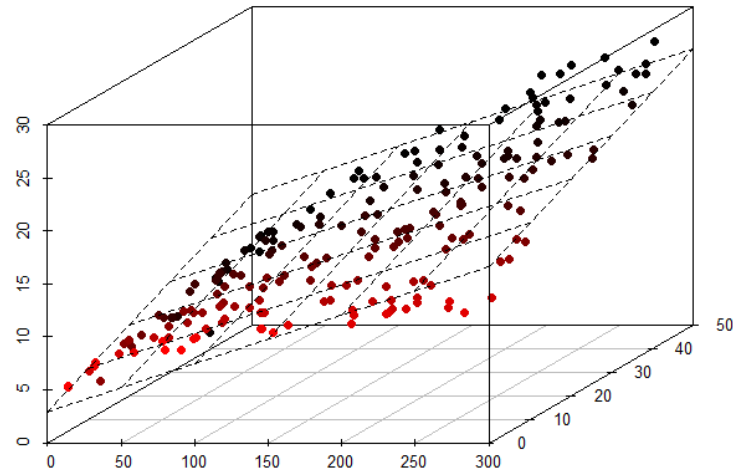
d --> constant term

Inference: As the complexity of the model increases,
It tends to Overfit with the data.

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

$$Y = w_1 X_1 + b$$

Multiple
Linear
Regression

$$Y = w_1 X_1 + w_2 X_2 + w_3 X_3 + b$$

Regularization

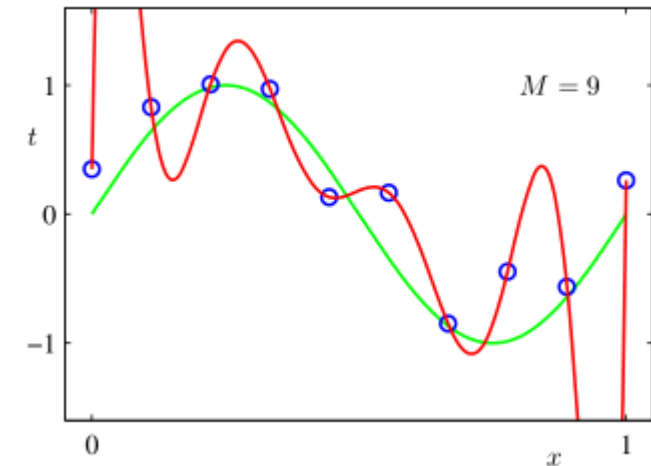
Regularization is used to reduce the overfitting of the model by adding a **penalty** term (λ) to the model. Lasso Regression uses L1 regularization technique.

The “penalty” term reduces the value of the coefficients or eliminate few coefficients, so that the model has fewer coefficients. As a result, overfitting can be avoided.

3rd order Polynomial equation : $y = ax^3 + bx^2 + cx + d$

This Process is called as **Shrinkage**.

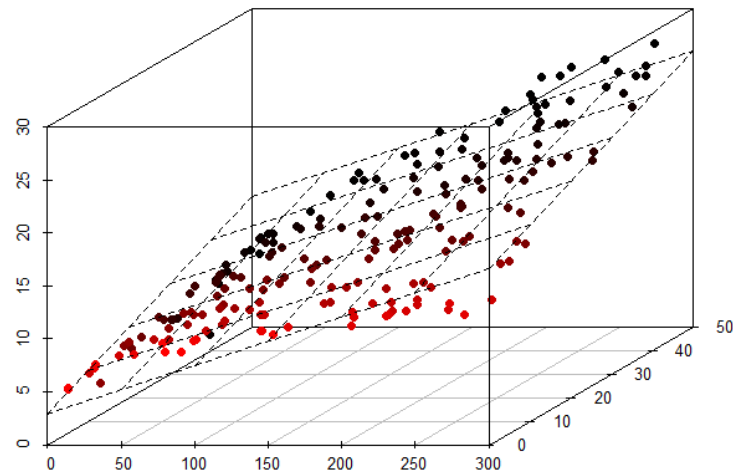
LASSO --> **Least Absolute Shrinkage and Selection Operator**



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Simple
Linear
Regression

$$Y = w_1 X_1 + b$$

Multiple
Linear
Regression

$$Y = w_1 X_1 + w_2 X_2 + w_3 X_3 + b$$

Feature Selection