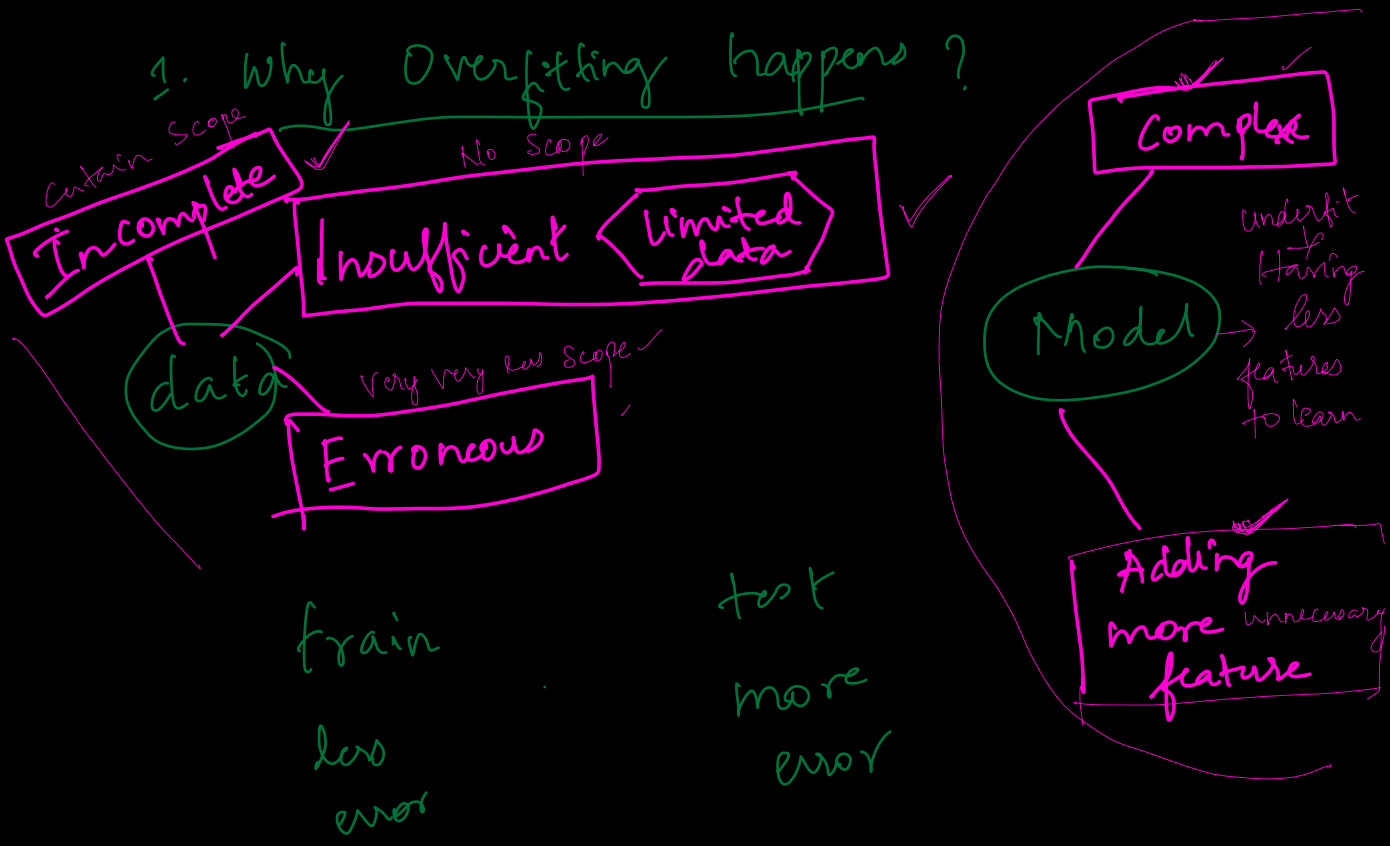


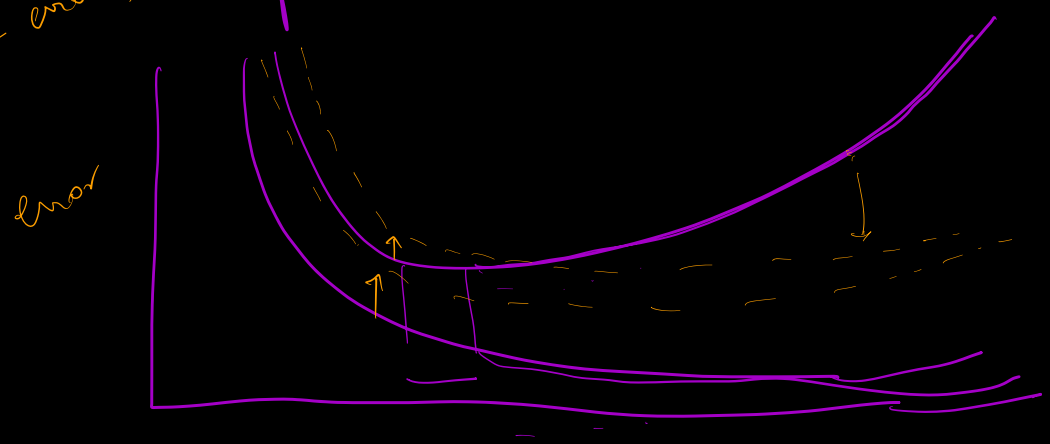
Regularization

Generalizing the model

train test

pull the Score Down to make train and test equal

Score (R^2) = (1 - error)



Make the Coefficient smaller

Loss function => MSE ↓

finding m and b

Regularization

Loss function = { ↑MSE ↓ finding m and b

and

make sure m and b is reduced

Loss function = MSE +

whenever the value of m and b is choosen we need to add a error associated with m and b

Concentrating in 1 subject

Concentrating all with unceesary subject (PED, Politics, social scien)

Coefficient

MSE + Coefficient

Ridge Regression

$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3$

$y = mx + b$

$y = ax + b$

$$MSE + \lambda \left[\sum_{0}^{n} \beta^2 \right]$$

$\lambda = 0 \Rightarrow$ Linear Regression

$\lambda = \uparrow \Rightarrow$ Overly compressing your coefficient

Lasso Regression

$$MSE + \lambda \sum_{0}^{n} |\beta|$$

$\lambda = 0$ → Linear Regression

$\lambda = \uparrow$ → Overly compress your coefficient this will even make the coefficient ZERO

Selection → feature selection → insignificant columns

Elastic Net

Ridge + Lasso

$$MSE + \lambda\left[\alpha\left(\sum_{0}^{n} \beta^2\right) + (1-\alpha)\left(\sum |\beta|\right)\right]$$

$\alpha = 0 \Rightarrow$ Lasso

$\alpha = 1 \Rightarrow$ Ridge