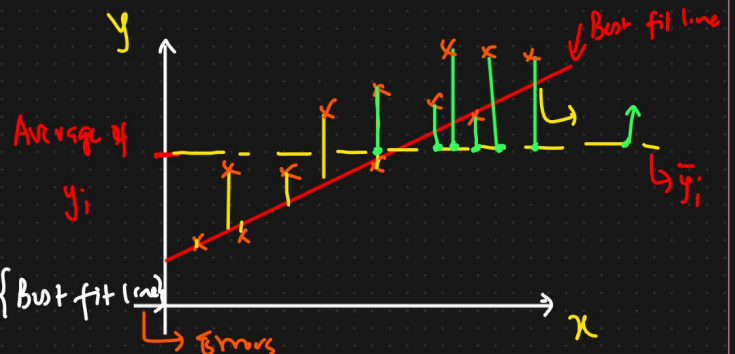


Performance Metrics Used In Linear Regression

① R squared

② Adjusted R squared

① R squared



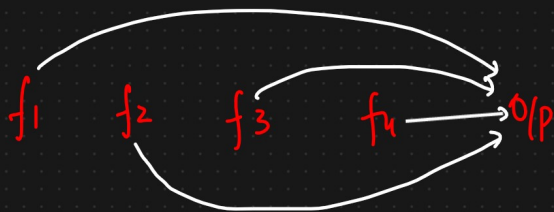
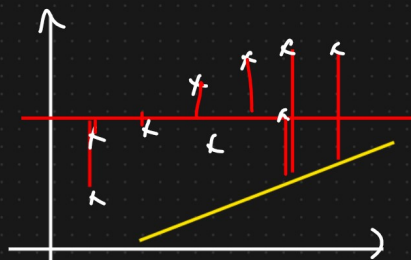
$$R_{\text{squared}} = 1 - \frac{SS_{\text{Res}} \text{ (Best fit line)}}{SS_{\text{Total}} \text{ (Average of } y_i \text{ line)}} \rightarrow \text{Errors}$$

SS_{Res} = Sum of Squares Residual or Errors

SS_{Total} = Sum of Squared Total

$R_{\text{squared}} = 1 - \frac{\sum (y_i - \hat{y}_i)^2}{\sum (y_i - \bar{y}_i)^2}$	\Rightarrow Small value Big value
--	--

"R squared can be -ve"



Max $R_{\text{squared}} = 1$

$R_{\text{squared}} \uparrow \uparrow \uparrow$

$R_{\text{squared}} \Rightarrow 0.75 \Rightarrow 75\%$

$\Rightarrow 0.85 \Rightarrow 85\%$

{Overfitting Problem}

② Adjusted R squared

x_4
 Gender x_1 Size of the house x_2 No. of bedrooms x_3 Location y Price

$$R^2_{\text{squared}} = 85\%$$

$$R^2_{\text{squared}} = 90\%$$

$$R^2_{\text{squared}} = 91\%$$

$$\text{Adjusted } R^2_{\text{squared}} = 1 - \frac{(1 - R^2)(N - 1)}{N - p - 1}$$

N = No. of data points

p = No. of Independent features

$$R^2 = 80\% \quad N = 11 \quad p = 2$$

$$\begin{aligned}
 \text{Adjusted } R^2_{\text{squared}} &= 1 - \frac{(0.2)(10)}{11 - 2 - 1} = 1 - \frac{2}{8} \\
 &= 1 - \frac{1}{4} \\
 &= \frac{3}{4} = 0.75
 \end{aligned}$$

$$R^2 = 80\% \quad \text{Adjusted } R^2 = 75\%$$

$$p=3 \quad R^2 = 85\% \quad \text{Adjusted } R^2 = 78\%$$

$$R^2 = 88\% \quad \text{Adjusted } R^2 = 76\%$$



Independent is not
important