

Interpretation of Coefficients

Simple Linear Regression

$$h_\theta(x) = \theta_0 + \theta_1 x$$

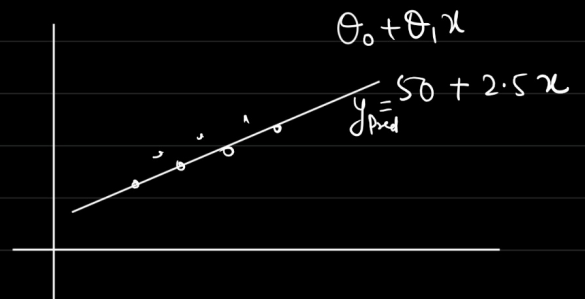
$$y_{\text{pred}} = \beta_0 + \beta_1 x$$

marks of student based on no. of hours studied.

y = marks of students

x = no of hours

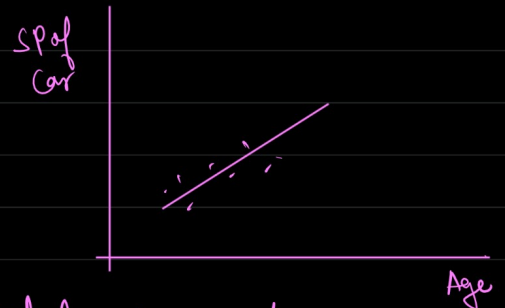
*
$$h_\theta(x) = \beta_0 + \beta_1 x = 50 + 2.5x$$



β_0 = The average score is 50 when no of hours studied is equal to 0

β_1 = With 1 unit increase in number of hours studied the marks of the students will increase by 2.5 units on an average.

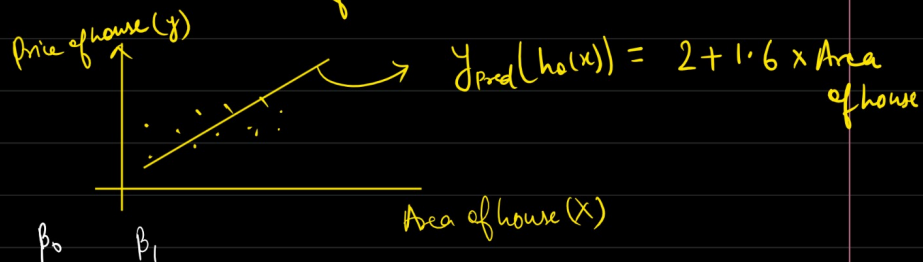
$$y_{\text{pred}} = \beta_0 - \beta_1 (\text{Age}) = 120 - 3.2 (\text{Age})$$



β_1 = With 1 unit increase in Age of the car, the SP of car is decreased by 3.2 units on an avg.

β_0 = The average selling price of car is 120 lakhs if the Age of the car 0 (newly bought)

* Price of house based on area of house



$$h_0(x) = 2 + 1.6 \times \text{Area of house}$$

β_1 - with 1 unit increase in Area of house, the price of house increases by 1.6 units

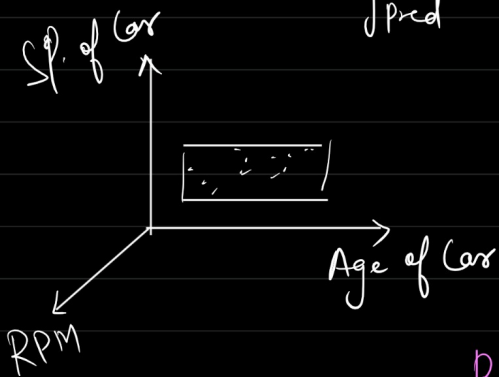
β_0 - The avg price of house is 2 ~~cr~~ when Area of house is 0.

Multiple linear Regression

↳ more than 1 independent variables/features

$$h_0(x) = \theta_0 + \theta_1 x_1 + \theta_2 x_2 - \dots - \theta_n x_n$$

$$y_{\text{pred}} = \beta_0 + \beta_1 x_1 + \beta_2 x_2 - \dots - \beta_n x_n$$

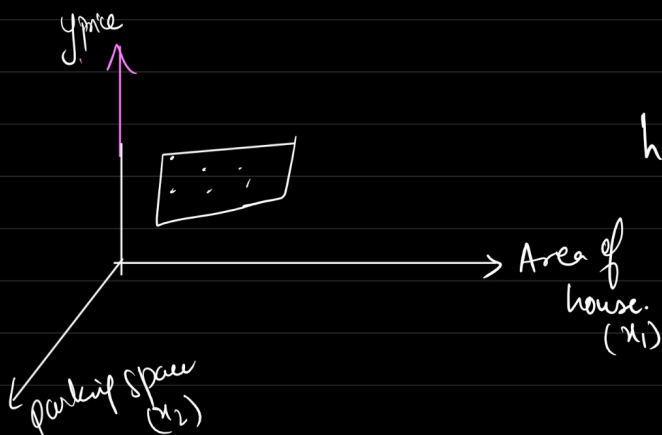


$$h_0(x) = 3 = \underset{\substack{\uparrow \\ \beta_0/\theta_0}}{0.52} (\text{Age of Car}) + \underset{\substack{\uparrow \\ \beta_1/\theta_1}}{2.5} (\text{RPM})$$

$\beta_1(0.52) \rightarrow$ With 1 unit increase in age of Car, the SP of Car decreases by 0.5 units on an average keeping RPM constant.

$\beta_2(2.5) \rightarrow$ With 1 unit increase in RPM the Selling Price of Car increases by 2.5 units on an average keeping Age of Car constant.

$\beta_0(3) \rightarrow$ The avg SP of Car is 3 units keeping all the factors constant.



$$h_0(x) = \underset{\substack{\downarrow \\ \theta_0}}{3.5} + \underset{\substack{\downarrow \\ \theta_1}}{8.2} \text{Area of house} + \underset{\substack{\downarrow \\ \theta_2}}{3.2} \text{parking space}$$

θ_0 - The avg price of house is 3.5 Cr after keeping all the factors constant.

$\theta_1 \rightarrow$ With 1 unit increase in

Area of house, the price of house on an avg increase by 8.2 units keeping other factors constant.

θ_2 - With 1 unit increase in parking space, on an avg the price of house increase by 3.2 units keeping all the factors constant.

* Feature importance

$$y_{\text{pred}} = h_{\theta}(x) = 3.5 + 8.2 \text{ Area of house} + 3.2 \text{ Parking Space} - 2.3 \text{ distance of Airport}$$

	<u>Coeff</u>	
✓ Area of house	8.2	{ Coeff's should be arranged with its absolute value
✓ Parking space	3.2	
✓ distance of Airport	2.3	

* The highest coeff will be the most important feature \Rightarrow Area of House