BOSTON HOUSING PRICE PREDICTION

Dataset is given with multiple features

Now we need to predict the price of house.

We will use Linear Regression for multiple features.

Let's write some important formula for L.R for multiple features.

1. Hypothesis :-

x - features.

$$h_\theta(x) = \theta^T x$$

$$h_\theta(x) = [\theta_0\ \theta_1\ \theta_2\ \ldots\ \theta_n] \begin{bmatrix} x_0 \\ x_1 \\ \vdots \\ x_n \end{bmatrix}$$

Loss function:-

$$J(\theta) = \frac{1}{m} \sum_{i=1}^{m} (y - \hat{y})^2$$

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

Gradient Descent :-

for $m = 1$

$$\frac{\partial J(\theta)}{\partial \theta_j} = (\hat{y} - y) \cdot x_j \qquad \text{for } m = 1$$

for $m > 1$:-

$$\frac{\partial J(\theta)}{\partial \theta_j} = \sum_{i=1}^{m} (\hat{y}^{(i)} - y^{(i)}) \cdot x_j^{(i)}$$

final Gradient update ..

$$\theta_j = \theta_j - \eta \sum_{i=1}^{m} (\hat{y}^{(i)} - y^{(i)}) x_j^{(i)}$$

for all value of j

$$\theta = \begin{bmatrix} \theta_0 \\ \theta_1 \\ \theta_2 \\ \vdots \\ \theta_n \end{bmatrix} \qquad \hat{y} = \theta^T x \quad \text{for any given } x$$

Note :- Here above formulaes used for the boston housing price predictions