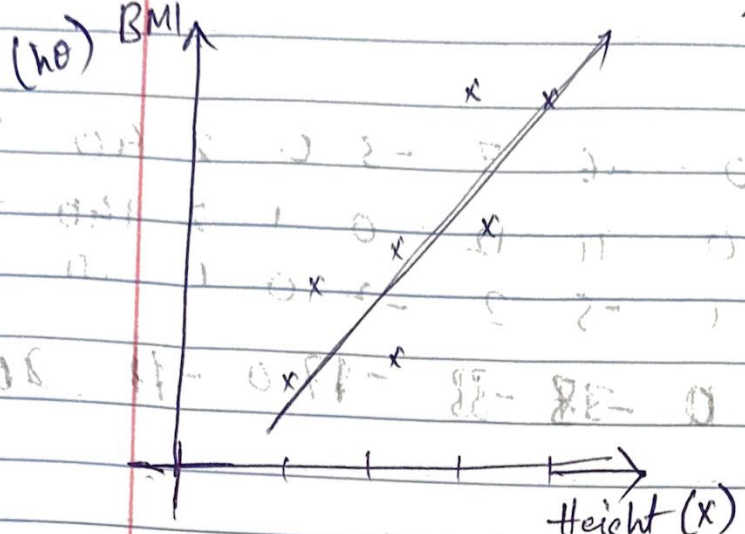
Simple Linear Regression:-



Independent Height	Depedent BMI
240	30
120	15
150	18
180	20

Increase of Independent
∝ Increase of Dependent.

There is a relation ~~by keeping~~ b/w them

So we want to use the relation and signify

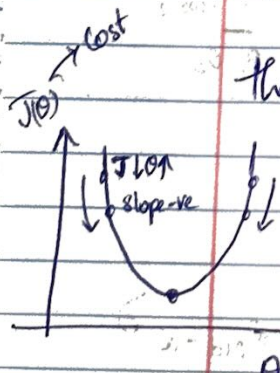
Make use of it (Draw a line)

$$h_\theta(0) = \theta_0 + \theta_1 (x)$$

θ_0 ⟶ Intercept If Independent value is 0 what could be the value of hθ.

For θ_1 — we choose some random value.

Then using Convergence we optimise the weights



gradient descent

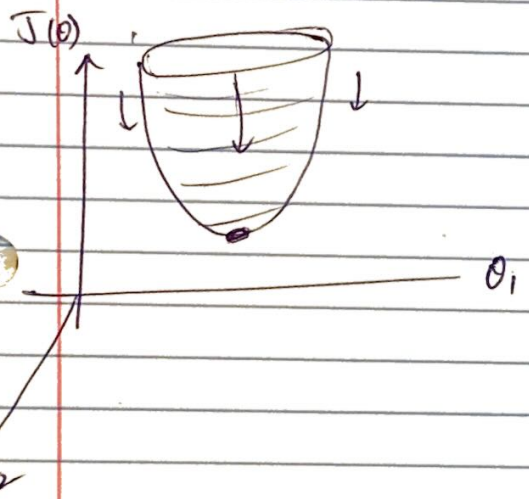
$$\theta_{new} = \theta_{old} - \alpha \frac{d(\text{cost fun}^n)}{d\theta}$$

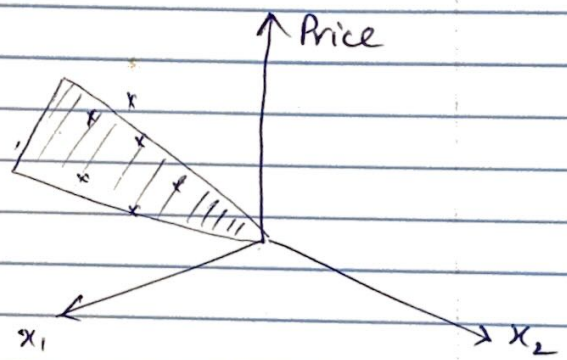
Error

$$\text{Cost Function} = \frac{1}{n}\sum (y_{(i)} - h_\theta(x))^2$$

In case of multiple linear regression we find best fit plane but in case of simple linear regression we just find best fit line.

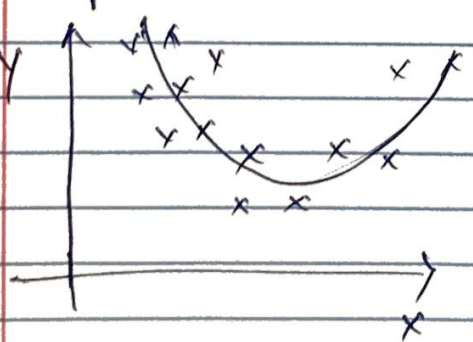
$$h_\theta(x) = \theta_0 + \theta_1 x_1 + \theta_2 x_2$$





Polynomial Regression :-

when pattern is curved we use



$$h_\theta(x) = \theta_0 x_1^{(0)} + \theta_1 x_1^{(1)} + \ldots + \theta_n x_n^{(n)}$$

* we play with the degrees to fit the line

Degree 2

Multiple polynomial :-

x_1, x_2

$$h_\theta(x) = \theta_0 + \theta_1 x_1 + \theta_2 x_2 + \theta_3 x_1^2 + \theta_4 x_2^2$$