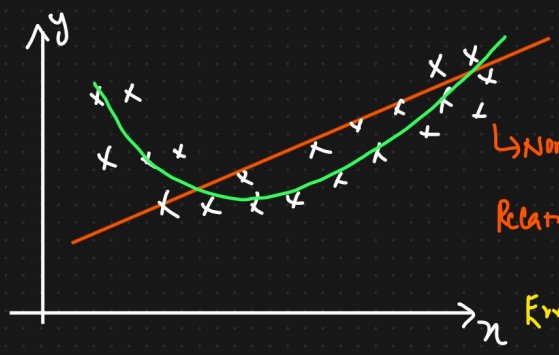
Polynomial Regression



$h_\theta(x) = \theta_0 + \theta_1 x_1$ → Simple Linear Regression

↳ Non linear Relationship

$h_\theta(x) = \theta_0 + \theta_1 x_1 + \theta_2 x_2 + \theta_3 x_3 + \cdots + \theta_n x_n$

↳ Multiple linear Regression

Polynomial Regression

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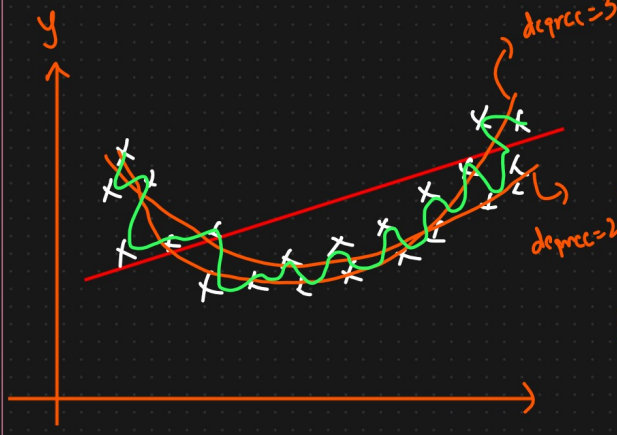
polynomial degrees.



Polynomial degree = 0 $\quad h_\theta(x) = \theta_0 * 1 \Rightarrow \theta_0 x_1^0$

Polynomial degree = 1 $\quad h_\theta(x) = \theta_0 x_1^0 + \theta_1 x_1^{(1)}$ [Simple linear Regression]

Polynomial degree = 2 $\quad h_\theta(x) = \theta_0 x_1^0 + \theta_1 x_1^1 + \theta_2 x_1^2$

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Polynomial degree = 3 $\quad h_\theta(x) = \theta_0 x_1^0 + \theta_1 x_1^1 + \theta_2 x_1^2 + \theta_3 x_1^3$

⋮

Polynomial degree = n $\quad h_\theta(x) = \theta_0 x_1^0 + \theta_1 x_1^{(1)} + \theta_2 x_1^2 + \theta_3 x_1^3 + \cdots + \theta_n x_1^n$

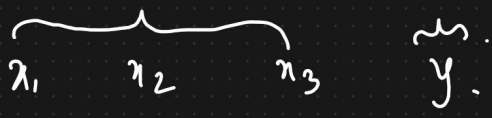
⇓

Simple polynomial Regression

{1 i/p feature, 1 o/p feature}

⑧ Multiple Polynomial Regression

{ Multiple Independent features }



polynomial degree = 2

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