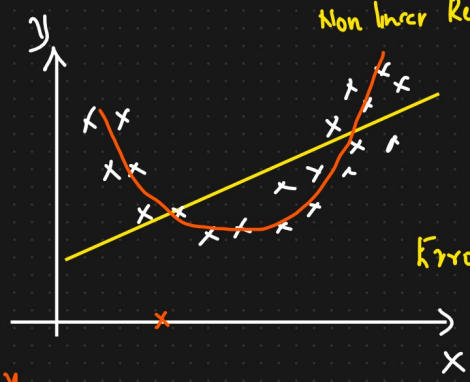
Polynomial Regression



$h_\theta(x) = \beta_0 + \beta_1 x$ — Simple Linear Regression

$h_\theta(x) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3$ — Multiple Linear Regression

Error ↑↑ Error ↓↓ ⟶ Polynomial Regression

Polynomial Degrees

→ Hyperplane degree = 0

Simple Polynomial Regression {1 I/p and 1 o/p feature}

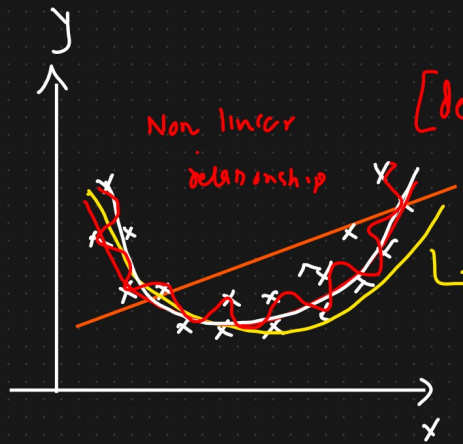
deg = 0

polynomial degree = 0 $h_\theta(x) = \beta_0 * x^0$ ⇒ Constant value

polynomial degree = 1 $\boxed{h_\theta(x) = \beta_0 * x^0 + \beta_1 * x^{(1)}}$ → Simple Linear Regression

polynomial degree = 2 $h_\theta(x) = \beta_0 * x^0 + \beta_1 * x^{(1)} + \beta_2 * x^{(2)}$

polynomial degree = n $\boxed{h_\theta(x) = \beta_0 * x^0 + \beta_1 * x^1 + \beta_2 * x^{(3)} + \beta_3 * x^{(3)} + \dots + \beta_n * x^{(n)}}$



[degree → values]

Degree = 15

↳ degree = 1

{2 independent feature}

degree = 1 $h_\theta(x) = \beta_0 + \beta_1 x_1 + \beta_2 x_2$

degree = 2 $h_\theta(x) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_1^2 + \beta_4 x_2^2$