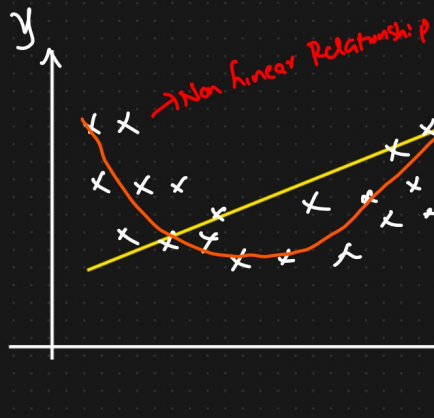


Polynomial Regression



Simple Linear Regression

$$h_0(x) = \theta_0 + \theta_1 x_1$$

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

Multiple Linear Regression

Polynomial Regression

Polynomial Degrees

Simple Polynomial Regr
Multiple Polynomial Regr

Simple Polynomial Regression

polynomial degree = 0

$$h_0(x) = \theta_0 x^0 = \theta_0 x^0 \Rightarrow \text{Constant}$$

polynomial degree = 1

$$h_0(x) = \theta_0 x^0 + \theta_1 x^1 \Rightarrow \text{Simple Linear Regression}$$

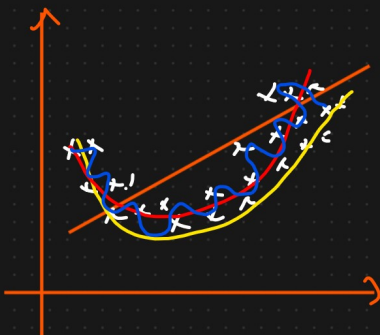
polynomial degree = 2

$$h_0(x) = \theta_0 x^0 + \theta_1 x^1 + \theta_2 x^2$$

$$h_0(x) = \theta_0 x^0 + \theta_1 x^1 + \theta_2 x^2 + \theta_3 x^3$$

polynomial degree = n

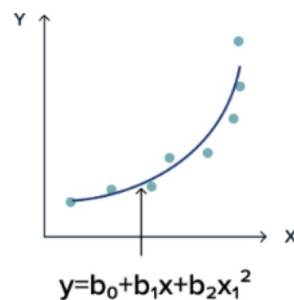
$$h_0(x) = \theta_0 x^0 + \theta_1 x^1 + \theta_2 x^2 + \dots + \theta_n x^n$$



Simple linear model



Polynomial model



① Multiple Polynomial Regression

$$h_0(x) = \theta_0 + \theta_1 x_1 + \theta_2 x_2 + \theta_3 x_3 \quad \{ \text{Multiple Linear Regression} \}$$

Polynomial Degree = 2

$$h_{\theta}(x) = \theta_0 + \theta_1 x_1 + \theta_2 x_2 + \theta_3 x_3 + \theta_4 x_1^2 + \theta_5 x_2^2 + \theta_6 x_3^2$$