$$\beta_j := \beta_0 - \underbrace{\alpha}_{\text{Alpha}} \left(\frac{\partial RSS}{\partial \beta} \right) \rightarrow \text{Error}$$

$$\frac{\partial RSS}{\partial \beta} = \frac{\partial (y_{true} - y_{pred})^2}{\partial \beta} \quad \text{— (1)}$$

$$= \frac{1}{2} \frac{\partial (y_{true} - (\beta_0 + \vec{\beta}_1 x))^2}{\partial \beta} \quad \text{— (2)}$$

Using Chain Rule $\rightarrow g(f(x))$

(3) $(y_{true} - (\beta_0 + \vec{\beta}_1 x)) \cdot \frac{\partial (y_{true} - (\beta_0 + \vec{\beta}_1 x))}{\partial \beta}$

(4) $(y_{true} - (\beta_0 + \vec{\beta}_1 x) \cdot (0 - (0 + 1(x))$

(5) $(y_{true} - (\beta_0 + \vec{\beta} x_i) \cdot x_i$

$$\boxed{\beta_j := \beta_0 - \alpha \left(y_{true} - (\beta_0 + \vec{\beta} x_i) \right) x_i}$$