Name : MUTHIRE NGABO Jean

Starting Values: $m = 1.7$, $b = 2.1$

Step 1: Calculate Predictions ($\hat{y}$) & Errors

where $\hat{y} = mx + b$

Error (e) = $y - \hat{y}$ or $\hat{y} - y$

And we have two points (1,3) and (3,6)

For point 1 (1,3)

- $\hat{y}_1 = (1.7)(1) + (2.1) = 3.8$
- Error (e) = $3.8 - 3 = 0.8$

For point 2 (3,6)

- $\hat{y}_2 = (1.7)(3) + (2.1) = 5.1 + 2.1 = 7.2$
- $e_2 = 7.2 - 6 = 1.2$

Step 2: Calculate Gradients.

- $\frac{\partial J}{\partial m} = \frac{2}{n} \sum_{i=1}^{n} (\hat{y} - y) x$; Gradient for m (Sum of Error . x), $n = 2$

$$\frac{\partial J}{\partial m} = (0.8)(1) + (1.2)(3) = 0.8 + 3.6 = 4.4$$

- $\frac{\partial J}{\partial b} = \frac{2}{n} \sum_{i=1}^{n} (\hat{y} - y)$; Gradient for b (Sum of Errors) and $n = 2$

$$\frac{\partial J}{\partial b} = 0.8 + 1.2 = 2.0$$

Step 3: Update Parameter

$$m_{new} = m_{old} - \alpha \frac{\partial J}{\partial m} \quad \text{as } \alpha = 0.1$$

$$b_{new} = b_{old} - \alpha \frac{\partial J}{\partial b}$$

$$\Rightarrow m_{new} = (1.7) - (0.1)(4.4) = 1.7 - 0.44 = 1.26$$

$$b_{new} = (1.7) - (0.1)(2.0) = 2.1 - 0.2 = 1.9$$