T*eniendo la función de costo*

$$x^2_{(a_o,a_1)} = \sum_{i=1}^{N} \big(y_i - (a_0 + a_1 x_i)\big)^2$$

Las expresiones para a_0 y a_1 se pueden hallar de la siguiente manera

$$\frac{dx^2}{da_0} = -2\sum_{i=1}^{N} y_i - (a_0 + a_1 x_i) = 0$$

$$\frac{dx^2}{da_1} = -2\sum_{i=1}^{N} x_i\big(y_i - (a_0 + a_1 x_i)\big) = 0$$

Para a_0

$$-2\sum_{i=1}^{N} y_i - (a_0 + a_1 x_i) = 0$$

Se toma el valor promedio de x y y, se obtiene

$$-2\big(\bar{y} - (a_0 + a_1\bar{x})\big) = 0$$

$$-2\bar{y} + 2a_0 + 2a_1\bar{x} = 0$$

$$a_0 = \bar{y} - a_1\bar{x}$$

Para a_1

$$-2\sum_{i=1}^{N} x_i\big(y_i - (a_0 + a_1 x_i)\big) = 0$$

$$-2\sum_{i=1}^{N} x_i(y_i - (\bar{y} - a_1\bar{x} + a_1 x_i)) = 0$$

$$-2\sum_{i=1}^{N} x_i(y_i - \bar{y} + a_1\bar{x} - a_1 x_i) = 0$$

$$-2\sum_{i=1}^{N} (x_i(y_i - \bar{y})\ ) + a_1 x_i x_i - a_1 x_1 \bar{x} = 0$$

$$-2\left(\sum_{i=1}^{N} x_i(y_i - \bar{y})\ + \sum_{i=1}^{N} a_1 x_i^2 - \sum_{i=1}^{N} a_1 x_i \bar{x}\right) = 0$$

$$\sum_{i=1}^{N} x_i(y_i - \bar{y}) + \sum_{i=1}^{N} a_1 x_i^2 - \sum_{i=1}^{N} a_1 x_i \bar{x} = 0$$

$$\sum_{i=1}^{N} x_i(y_i - \bar{y}) = -\sum_{i=1}^{N} a_1 x_i^2 + \sum_{i=1}^{N} a_1 x_i \bar{x}$$

$$a_1\left(-\sum_{i=1}^{N} x_i^2 + \sum_{i=1}^{N} x_i \bar{x}\right) = \sum_{i=1}^{N} x_i\ (y_i - \bar{y})$$

$$a_1 = \frac{\sum_{i=1}^{N} x_i(y_1 - \bar{y})}{-\sum_{i=1}^{N} x_i \bar{x} + \sum_{i=1}^{N} x_i^2}$$

$$a_1 = \frac{\sum_{i=1}^{N} x_i y_1 - \frac{\sum_{i=1}^{N} x_i \sum_{i=1}^{N} y_1}{n}}{\sum_{i=1}^{N} x_i^2 - \frac{\sum_{i=1}^{N} (x_i)^2}{n}}$$