$\theta_0, \theta_1 = ?$

$$\underset{\theta_0,\ \theta_1 \mid x_i, y_i}{\operatorname{argmin}} \sum_{i=1}^{n} (y_i - (\theta_0 + \theta_1 x_i))^2$$

$$\frac{\partial}{\partial \theta_0} = -2 \sum_{i=1}^{n} (y_i - (\theta_0 + \theta_1 x_i))$$

$$\sum_{i=1}^{n} (y_i - (\theta_0 + \theta_1 x_i)) = 0$$

$\sim$

$$\frac{\partial}{\partial \theta_1} = -2 \sum_{i=1}^{n} x_i (y_i - (\theta_0 + \theta_1 x_i))$$

$$\sum_{i=1}^{n} x_i (y_i - (\theta_0 + \theta_1 x_i)) = 0$$

$$\sum_{i=1}^{n} y_i = n\theta_0 + \theta_1 \sum_{i=1} x_i$$

$$\sum_{i=1}^{n} x_i y_i = \theta_0 \sum_{i=1}^{n} + \theta_1 \sum_{i=1}^{n} x_i^2$$

$$\theta_0 = \frac{1}{n} \sum_{i=1}^{n} y_i - \theta_1 \frac{1}{n} \sum_{i=1} x_i$$

$$\sum_{i=1}^{n} x_i y_i = \left(\frac{1}{n} \sum_{i=1}^{n} y_i - \theta_1 \frac{1}{n} \sum_{i=1}^{n}\right) \sum_{i=1}^{n} + \theta_1 \sum_{i=1}^{n} x_i^2$$

$$\theta_1 = \frac{n\sum_{i=1}^{n} x_i y_i - \sum_{i=1}^{n} x_i \sum_{i=1}^{n} y_i}{n\sum_{i=1}^{n} x_i^2 - \left(\sum_{i=1}^{n} x_i\right)^2}$$

$$\theta_0 = \frac{1}{n}\sum_{i=1}^{n} y_i - \theta_1 \frac{1}{n}\sum_{i=1}^{n} x_i$$

$\sum X = 210 \quad \sum Y = 455.94$

$\bar{X} = 10.5 \quad \bar{Y} = 22.79$

$\sum (X_i - \bar{X})(Y_i - \bar{Y}) = 1110.3$

$\sum (X_i - \bar{X})^2 = 665$

$$\theta_1 = \frac{\sum (X_i - \bar{X})(Y_i - \bar{Y})}{\sum (X_i - \bar{X})^2} = \frac{1110.3}{665} = 1.67$$

$\theta_0 = \bar{Y} - \theta_1 \cdot \bar{X}$

$\theta_0 = 22.79 - (1.67)(10.5) = 5.26$

$Y = 5.26 + 1.67X$