$$SSQR = \sum_{i=1} \left[y_i - b_0 - b_1 x_i\right]^2$$

$$\frac{\partial SSQR}{\partial b_1} = -2 \sum_{i=1}^{N=10} x_i \left[y_i - b_0 - b_1 x_i\right]$$

$$= -2 \left[\sum_{i=1}^{N=10} x_i y_i - b_0 \sum_{i=1}^{N=10} x_i - b_1 \sum_{i=1}^{N=10} x_i^2\right]$$

$$x_\bullet = \sum_{i=1}^{N} x_i \; ; \quad \bar{x}_\bullet = \frac{x_\bullet}{N} \; ; \quad \boxed{y_\bullet = \sum_{i=1}^{N} y_i} \; ; \quad \bar{y}_\bullet = \frac{y_\bullet}{N}$$

$$(x^2)_\bullet = \sum_{i=1}^{N} x_i^2 \; ; \quad (xy)_\bullet = \sum_{i=1}^{N} x_i \cdot y_i$$

$$(1) \quad \frac{\partial SSQR}{\partial b_0} = \left[y_\bullet - N b_0 - b_1 x_\bullet\right] \cdot (-2)$$

$$(2) \quad \frac{\partial SSQR}{\partial b_1} = -2 \left[(xy)_\bullet - b_0 x_\bullet - b_1 (x^2)_\bullet\right]$$

find values $\hat{b}_0$ and $\hat{b}_1$ such that

from (1): $y_\bullet - N\hat{b}_0 - \hat{b}_1 x_\bullet = \emptyset \Leftrightarrow N\hat{b}_0 + \hat{b}_1 x_\bullet = y_\bullet$

from (2): $(xy)_\bullet - \hat{b}_0 x_\bullet - \hat{b}_1 (x^2)_\bullet = \emptyset \Leftrightarrow \hat{b}_0 x_\bullet + \hat{b}_1 (x^2)_\bullet = (xy)_\bullet$