EE 325 Section 3 Take home quiz 2 February 27th, 2020 ☺

Data on X_i and Y_i are given in the table

i	X_i	Y_i
1	4	6
2	3	5
3	2	4
4	8	10
5	1	3

Suppose you decide to fit the following model

$Y_i = \beta_1 + \beta_2 X_i + u_i$ where $u_i \sim NIID(0, \sigma^2)$

$\sum X_i = 18, \sum Y_i = 28$

$\bar{X} = 3.6, \bar{Y} = 5.6$

$\sum(X_i - \bar{X})^2$=29.2

$\sum(X_i - \bar{X})(Y_i - \bar{Y})$=29.2

$\sum X_i Y_i = 130, \sum X_i \sum Y_i = 504, \left(\sum X_i\right)^2 = 94$

Compute estimators of β_1 and β_2 $(\hat{\beta}_1 and \hat{\beta}_2)$.

Interpret the regression.

$\hat{B}_2 = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sum(x_i - \bar{x})^2}$

$= \frac{29.2}{29.2} = 1$

$\hat{B}_1 = \bar{y} - \hat{B}_2 \bar{x}$

$= 5.6 - (1)3.6 = 2$

$\hat{B}_2 = 1$ means that if x change by 1unit, on average, y will change by 1 unit in the same direction.