Stat763 HW01

1. A sample for regression produced

 $n = 8, \overline{x} = 1.375, \overline{y} = 3.125, Sxx = 19.875, Syy = 18.875, Sxy = 10.625.$

For each required computation below, write out formula first followed by numerical results. Keep 3 digits after decimal point for final results.

- (1) Find $n, \sum x, \sum y, \sum x^2, \sum y^2$ and $\sum xy$.
- (2) For model $y = \beta_0 + \beta_1 x + \epsilon$ with $\epsilon \sim N(0, \sigma^2)$ find $\widehat{\beta}_1, \, \widehat{\beta}_0 \text{ and } \widehat{y}(1).$
- (3) For the model with intercept find $SSE, MSE, S_{\widehat{\beta}_0}, S_{\widehat{\beta}_1} \text{ and } S_{\widehat{y}(1)}.$
- 2. A sample for the simple linear regression without intercept produced

$$n = 4, \sum x = 2, \sum y = 14, \sum x^2 = 6, \sum y^2 = 54, \sum xy = 4.$$

For the following required computation, write out formula and keep 4 digits after decimal point for you final results.

- (1) Find $\hat{\beta}$ and $\hat{y}(2)$.
- (2) Find SSE, MSE, $S_{\widehat{\beta}}$ and $S_{\widehat{y}(2)}$.