1. What information does the scatter plot tell you?

   Answer: It shows you by visual inspection whether there is any relationship between x and y during the stage of exploratory data analysis.

2. What is the conceptual difference between error (noise, disturbance, etc) and residual?

   Answer: Error is a conceptual construction whereas residuals can be obtained numerically.

3. Why is the residual the vertical length and not the shortest distance to the fitted line ?

   Answer: Residual is computed as the difference between the actual y value and the fitted value (on the regressed line) $\hat{y}$. These two values are in the y direction and no x direction is involved.

4. What is the denominator of the slope estimate?

   Answer: $\sum_{i=1}^{n}(x_i - \overline{x})^2$

5. What is the denominator of the variance of the slope estimate?

   Answer: $\sum_{i=1}^{n}(x_i - \overline{x})^2$

6. What does the Gauss-Markov theorem say about the linear and unbiased estimators?

   Answer: Among all the unbiased linear estimators, OLS estimator is the most efficient in the sense that the variance of the estimator is the smallest (thus more precise).

7. In Proposition 1, which of the classical assumptions is employed?

   Answer: A1 $\mathbb{E}(e_i) = 0$ for all i.

8. What is the reason for using the t-distribution rather than the standard normal distribution?

   Answer: The population variance is not available and sample variance is employed instead to compute the standard error.

9. What is the relationship between R^2 and the correlation?

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10. What is the difference in the predictive confidence interval of Model 1 and Model 0?

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11. What are the new things you have learned today? Which topics are still unclear?