Simple Linear Regression

1. Which statement is false?

   - Even though random error ϵ is unobserved, the true slope and intercept, β_1 and β_0, are observed.
   - Even the population regression model is not a perfect straight line.
   - β_1 is the change in Y to a unit change in X, and β_0 is the value of Y when X is zero.
   - Unlike the correlation coefficient, in regression it matters which variable is the dependent variable and which is the independent variable.

2. Which of the following is incorrect?

   - $Y_i = \beta_0 + \beta_1 X_i + \epsilon_i$
   - $Y_i = b_0 + b_1 X_i + \hat{\epsilon}_i$
   - $Y_i = b_0 + b_1 X_i + \epsilon_i$
   - $\hat{Y}_i = b_0 + b_1 X_i$

3. Which of the following statements is false?

   - The simple regression line aims to fit a straight line for the relationship between two numerical variables.
   - The higher the r^2 of the regression, the better the regression model fits the data.
   - If the variance of X and Y were identical, then the estimated regression slope, b_1, and the correlation coefficient would be identical.
   - The regression sum of squares (RSS) is the squared difference between the actual and predicted values of Y.