Mid-Term Makeup

Tuesday, October 27, 2020 11:08 AM

Questions 14, 15, and 16

14) Answer the following questions
    a. What is the term for constant variance?
        i. **Homoskedasticity**
    b. What is the sum of squares for error(SSE)?
        i. $\boldsymbol{SSE = \sum_{i=1}^{n} (y_i - \hat{y})^2}$
    c. What is the range of values of SSR/SST?
        i. **0 to 1 or 0% to 100%**
    d. What is the terminology for SSR/SST?
        i. $\boldsymbol{R^2 = 1 - \frac{SSR}{SST}}$
        R^2 = Coefficient of Determination
        SSR = Sum of Squared Residual
        SST = Sum of Squared Total
    e. What is the range of values of correlation?
        i. **From -1 to 1, including -1 and 1 as possible values**
    f. What are the assumptions of Linear Regression?
        i. **y/x is normally distributed**
        for given x, y is normally distributed
        ii. **Average value of E in the population is zero**
        iii. **E and X are not correlated**
15) Use the stata output to answer the following questions:
    a. Obtain the best least squares fir for the data
        i. From the stata output, we can define
            1) Slope of regression line = 7.079
            2) Intercept of regression line = -28.53
        ii. Therefore,
            1) Y = -28.53 + 7.079X
    b. Interpret the intercept and slope
        i. Intercept interpretation
            1) **If the unemployment rate increases by 1% then annual murders will increase by 7.079 million**
        ii. Interpret slope
            1) **According to the graph, if unemployment = 0 then annual murders = 0 because you can't have a negative number of murders.** However, that would be pretty if people start coming back to life if everyone alive has a job.
    c. What is the proportion of variance explained by the model
        i. R^2 = the proportion of variance, according to the model. **Therefore R^2 = 0.748 aka the model explains a 74.8% variance in annual murders because of unemployment.**
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