Ministry of Higher Education & Scientific Research Salahaddin University-Erbil College of Administration and Economics



Subject: Linear models Date: 16 / 5 / 2024 Time: 1:30 Hours Department: Statistics and Informatics

master Med-term Exam 2023-2024

Q1/In the regression of Y = cost of production on X = output for the 123 electric utility companies, $R^2 = 0.92$, Explain the relationship between correlation x, y

Q2/we investigated the effect of X = lot size on Y = the sales price of a house, using data on 546 houses sold in Windsor, Canada, confidence interval for B is [5.72, 7.47] for error equal to 0.05. we obtain the following estimated relationship: <math>Y = 34.136 + 6.59XExplain the model of regression and hypothesis testing is to calculate a test statistic (t-table=1.96)

Q3/ you have information about linear regression

 \bar{x} = 202.95294 SXX = 530.78235 SXY = 475.31224 \bar{y} = 139.60529 SYY = 427.79402 t (0.05, 15) = 1.753

- 1- Find the model of linear regression
- 2- Estimated σ^2
- 3- Find the variance and **Cov**(β_0 , β_1)
- 4- Analysis of Variance (ANOVA)
- 5- C.I for Intercept and Slope

Q4/ prove that

- 1- $\sum e_i = 0$
- 2- $E\beta^{}=\beta$

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