



**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:  $Y = 34.136 + 6.59X$   
Explain the model of regression and hypothesis testing is to calculate a test statistic ( $t$ -table=1.96)

Q3/ you have information about linear regression

$$\bar{x} = 202.95294 \quad SXX = 530.78235 \quad SXY = 475.31224$$

$$\bar{y} = 139.60529 \quad SYY = 427.79402 \quad t(0.05, 15) = 1.753$$

- 1- Find the model of linear regression
- 2- Estimated  $\sigma^2$
- 3- Find the variance and  $\text{Cov}(\hat{\beta}_0, \hat{\beta}_1)$
- 4- Analysis of Variance (ANOVA)
- 5- C.I for Intercept and Slope

Q4/ prove that

$$1- \sum e_i = 0$$

$$2- E\hat{\beta} = \beta$$