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19HS20054

Econometrics - Test-1

Group - A

1) B
2) B
3) A
4) C
5) D
6) B
7) D
8) A
9) A
10) D
11) D
12) D
13) C
14) B

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Page

Group - B

Q1 Bivariate Model: $Y_i = \alpha + \beta X_i + u_i$

The estimated co-efficient of X_i in this model is given as:

$$\hat{\beta} = \frac{\sum x_i y_i}{\sum x_i^2}, \text{ where } \begin{cases} x_i = X_i - \bar{X} \\ y_i = Y_i - \bar{Y} \end{cases}$$

Multiple Regression Model: $Y_i = \delta + \lambda X_i + \theta Z_i + v_i$

Here, the estimated co-efficient of X_i is:

$$\hat{\lambda} = \frac{[\sum x_i y_i][\sum z_i^2] - [\sum z_i y_i][\sum x_i z_i]}{[\sum x_i^2][\sum z_i^2] - (\sum x_i z_i)^2}$$

The sign of the co-efficient can change in this model considering the co-relation between X & Z. If the correlation between X & Z is high enough λ can become negative.

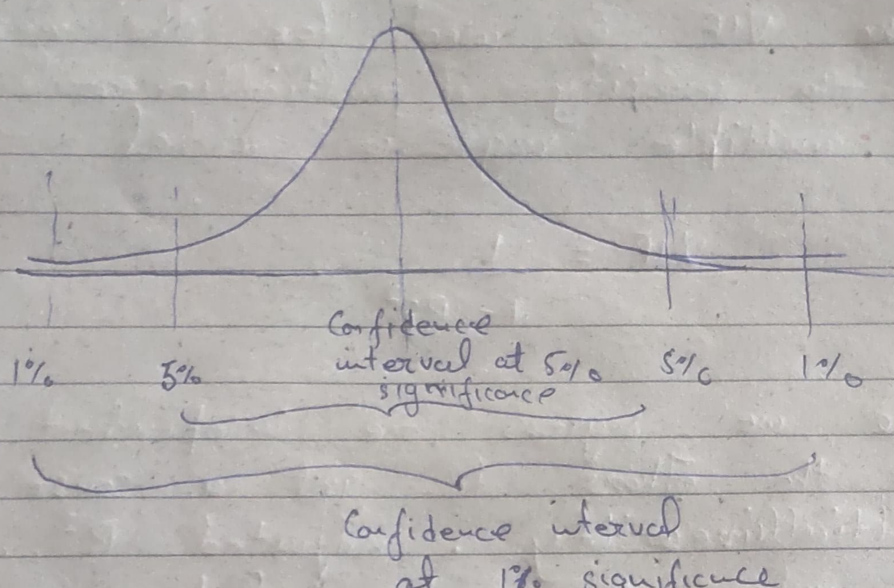
If we estimate production of burgers in McDonald's as (Y) & no. of ~~machines to fry the patties~~ grills as (X), and then include (Z) as no. of workers, the co-efficient of (X) may become (-ve) as it is a labour intensive job, increasing the no. of grills may (-vely) impact (Y)

Q2 The VIF is used for the measurement of the severity of multicollinearity in a multiple regression model

$$VIF = \frac{1}{1 - R_j^2}$$

Here we regress one independent variable on the others to get a sense of multicollinearity. Adjusted R^2, adjusts the value for number of terms in a model which is not desired when we are looking for multicollinearity ~~for~~, so R^2 is used

Q3



When we change the significance level from 10% → 5% → 1%, we are basically making our model stricter for the results.

5% → If the null hypothesis is rejected the test statistic has cleared the bar for 95% confidence level whose critical value is lower ~~as~~ when compared to 1% significance level. Which means that there is higher probability that we fail to reject the Null Hyp.

In the given case we can say that the Null Hyp ($\beta = 0$) is not rejected at 1% significance.