Lady Shri Ram College for Women
May 13, 2024 Roll No:_____

B.A. Hons Economics - Sem IV
Introductory Econometrics - END SEM PRACTICAL
UPC:12271403
SET-A

Maximum Marks: 20

1. (20 points) The data set provided (**data1.xlsx**) contains data from 38 countries for *"Expenditure on Education" (millions of US Dollars)* **(y)**, *"GDP" (millions of US Dollars)***(x1)** and *"Population" (millions of People)***(x2)**. Do the following exercise:

    1. Run an OLS regression of y on x_1 and x_2. Interpret the estimated intercept and slope coefficients. Comment on the statistical significance of the estimated coefficients. Comment on the 'goodness of fit' of the regression estimated above. **(5 Marks)**
    2. Save the residuals from the regression. Graph the distribution of the OLS residuals against that of the standard normal, and comment on whether the former appears to be normally distributed. Also conduct the Jarque Bera Test (Or any other Formal test of Normality) on the residuals from the regression, and check whether the residuals are following the OLS assumption of Normality. **(5 Marks)**
    3. Use any formal method to test for the presence (if any) of Heteroscedasticity in the above regression. Interpret your results**(5 Marks)**
    4. Use any formal method to test for the presence (if any) of Multicollinearity in the above regression. Interpret your results. **(5 Marks)**

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SET-B

Maximum Marks: 20

1. (20 points) The data set provided (**data2.xlsx**) contains data from 64 countries for *"Child Mortality"* **(y)**, *"Female Literacy Rate"***(x1)**, *"Total Fertility Rate"***(x2)** and *"Per Capita GNP"***(x3)**. Do the following exercise:

    1. Run an OLS regression of y on x_1, x_2 and x_3. Interpret the estimated intercept and slope coefficients. Comment on the statistical significance of the estimated coefficients. Comment on the 'goodness of fit' of the regression estimated above. **(5 Marks)**
    2. Save the residuals from the regression. Graph the distribution of the OLS residuals against that of the standard normal, and comment on whether the former appears to be normally distributed. Also conduct the Jarque Bera Test (Or any other Formal test of Normality) on the residuals from the regression, and check whether the residuals are following the OLS assumption of Normality. **(5 Marks)**
    3. Use any formal method to test for the presence (if any) of Heteroscedasticity in the above regression. Interpret your results**(5 Marks)**
    4. Use any formal method to test for the presence (if any) of Multicollinearity in the above regression. Interpret your results. **(5 Marks)**

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B.A. Hons Economics - Sem IV
Introductory Econometrics - END SEM PRACTICAL
UPC:12271403
SET-C

Maximum Marks: 20

1. (20 points) The data set provided (**data3.xlsx**) contains data from 50 US states for *"output", measured as value added in thousands of U.S. dollars* **(y)**, *"worker hours"***(x1)** and *"capital expenditures"***(x2)**. Do the following exercise:

    1. Run an OLS regression of y on x_1 and x_2. Interpret the estimated intercept and slope coefficients. Comment on the statistical significance of the estimated coefficients. Comment on the 'goodness of fit' of the regression estimated above. **(5 Marks)**
    2. Save the residuals from the regression. Graph the distribution of the OLS residuals against that of the standard normal, and comment on whether the former appears to be normally distributed. Also conduct the Jarque Bera Test (Or any other Formal test of Normality) on the residuals from the regression, and check whether the residuals are following the OLS assumption of Normality. **(5 Marks)**
    3. Use any formal method to test for the presence (if any) of Heteroscedasticity in the above regression. Interpret your results**(5 Marks)**
    4. Use any formal method to test for the presence (if any) of Multicollinearity in the above regression. Interpret your results. **(5 Marks)**

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B.A. Hons Economics - Sem IV
Introductory Econometrics - END SEM PRACTICAL
UPC:12271403
SET-D

Maximum Marks: 20

1. (20 points) The data set provides (**data4.xlsx**) data from 84 of the largest firms in the Netherlands for *"average salary" of top managers (in thousands of Dutch guilders)* **(y)**, *"profit" (in millions of Dutch guilders)***(x1)** and *"turnover" (in millions of Dutch guilders)***(x2)**. Do the following exercise:

    1. Run an OLS regression of y on x_1 and x_2. Interpret the estimated intercept and slope coefficients. Comment on the statistical significance of the estimated coefficients. Comment on the 'goodness of fit' of the regression estimated above. **(5 Marks)**
    2. Save the residuals from the regression. Graph the distribution of the OLS residuals against that of the standard normal, and comment on whether the former appears to be normally distributed. Also conduct the Jarque Bera Test (Or any other Formal test of Normality) on the residuals from the regression, and check whether the residuals are following the OLS assumption of Normality. **(5 Marks)**
    3. Use any formal method to test for the presence (if any) of Heteroscedasticity in the above regression. Interpret your results**(5 Marks)**
    4. Use any formal method to test for the presence (if any) of Multicollinearity in the above regression. Interpret your results. **(5 Marks)**

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Lady Shri Ram College for Women
May 01, 2025

Roll No: 131

B.A. Hons Economics - Sem IV
Introductory Econometrics - END SEM PRACTICAL
UPC:2272102403
SET-D

Maximum Marks: 20

1. (20 points) The data set (**data4.xlsx**) provides data from 84 of the largest firms in the Netherlands for "average salary" of top managers (in thousands of Dutch guilders) (y), "profit" (in millions of Dutch guilders)(x1) and "turnover" (in millions of Dutch guilders)(x2). Do the following exercise:

1. Run an OLS regression of y on x_1 and x_2. Interpret the estimated intercept and slope coefficients. Comment on the statistical significance of the estimated coefficients. Comment on the 'goodness of fit' of the regression estimated above. (10 **Marks)**
2. Save the residuals from the regression. Graph the distribution of the OLS residuals against that of the standard normal, and comment on whether the former appears to be normally distributed. Also conduct the Jarque Bera Test (Or any other Formal test of Normality) on the residuals from the regression, and check whether the residuals are following the OLS assumption of Normality. ***(10 Marks)***

Introductory Econometrics

Practical Exam

Semester 4 – 2024-25

Duration – 3 hours **Marks – 20**

Instructions

1. **All questions are compulsory.**
2. **Each question carries 5 marks. Viva = 10 marks.**
3. **Write down the code and the result on the answer sheet.**
4. **Use dataset mtcars.**

Q1. Create a simple regression model with 'mpg' as the dependent variable and 'hp' as an independent variable.

a. Write the estimated regression function.
b. Interpret the intercept and the slope coefficients.
c. Test for significance of the coefficients at 5% level of significance.
d. What is coefficient of determination for the model?

Q2. Create a multiple linear regression model with 'mpg' as the dependent variable and 'hp' and 'cyl' as the independent variables.

a. What is the estimated regression function?
b. Interpret the coefficients.
c. Test for the significance of the coefficients at 5% level of significance. What do you observe when you compare multiple regression model with model in previous question?
d. What is r square of the model? What is adjusted r square?
e. Test for the overall significance of the model.

Q3. Create a polynomial function with 'hp' and 'squared hp' as independent variable and 'mpg' as dependent variable.

a. Write the estimated model.
b. What is interpretation of coefficients of this model? Are they significant?
c. What is r squared ? can you compare the model in this question with models in previous questions?
d. Do you think the model suffers from multicollinearity? What are consequences of multicollinearity?

Q4. Create a model by adding a dummy variable – 'vs', in the model created in question 1.

a. What is the estimated regression model? Write down both models where vs=1 and vs = 0.
b. Interpret the coefficients.
c. Is there a significant difference in mileage based on engine types?
d. What is dummy variable trap?

Description of variables

mpg *- Miles per US gallon;* ***hp*** *– Gross Horse Power;* ***cyl*** *– number of cylinders in the engine;* ***vs*** *– engine type (1=straight engine, 0 = v-shaped engine)*

Practical Exam 1
Introductory Econometrics
2023-24

Time: 20 minutes **Marks: 20**

Name:

Examination Roll No.

Section: A / B

Date:

Time: .

Use **Dataset: greene25_1.gdt**

Q1. Provide the following for the **Number of major derogatory reports (majordrg)** **4**

- minimum
- maximum
- mean and
- number of missing values of variable

Q2. Create scattergram *without fit* of 'majordrg' on **4**

- **Average monthly credit card expenditure (avgexp)**
- **Status of self-employment (selfempl)**

Q3. Check whether 'majordrg' is associated with 'avgexp' and 'selfempl' **4**

- **Coefficient b1:**
- **Coefficient b2:**
- **$R^{2:}$**

Q4. Create a 99% confidence interval to test whether coefficient of avgexp is statistically different from zero.

- **Test: H0:**

  H1:

- **Interval:**
- **Verdict: reject/ not reject H0.** **3**

Q5. Conduct JB test of normality of the disturbance term in the above model. What do you conclude?

- **Test: H0:**

  H1:

- **Test statistic:**
- **Verdict: reject/ not reject** **3**

Q6. Generate reciprocal of income as 'rec_income' and give its maximum value.

Value: **2**

09:02 Vo)) LTE1 Vo)) LTE2 78%

Practical Exam 6
Introductory Econometrics
2023-24

Time: 20 minutes **Marks: 20**

Name:

Examination Roll No.

Section: A / B

Date: .

Use **Dataset: keane.gdt**

Q1. Provide the following for the **years of schooling (educ)** **4**

- skewness
- standard deviation
- mean and
- 95% percentile

Q2. Check whether 'wage' is associated with 'educ' and 'black', simultaneously. **4**

- **Se(b1):**
- **Coefficient b2:**
- **Coefficient b3:**
- **$R^{2:}$**

Q3. Create a 99% confidence interval to test whether coefficient of **'educ'** is statistically different from 1500 in the above model.

- **Test: H0:**
  H1:
- **Interval:**
- **Verdict: reject/ not reject H0.** **4**

Q4. Generate an interaction term for educ and black, call it 'e_b' and provide

- **Skewness of l_educ**
- **Create an ANCOVA model, regressing 'wage' on 'educ', 'black' and 'e_b'**. Provide

  a) the mean wage for a black person when education is zero:

  b) Partial slope coefficient of education for a non-black individual:

  c) Mean wage for a non-black individual with zero education:

Q2. (a) Now estimate a multiple linear regression model. Interpret the coefficients, overall explanatory power of the model and test for the individual coefficients if they are significant or not, also test for overall significance of the model. Clearly mention all the coefficients, their interpretation and the hypothesis. Dependent variable is Lnwage (log of wages) and independent variables are experience (exper, in years) and education (educ, in years). (8)

Q2. (b) Add the gender dummy variable given by the column 'female' (1 if female, 0 otherwise). Interpret the coefficient, overall explanatory power of the model and test for the dummy coefficient(s). Is there a significant difference in wages due to gender? (4)

lwage	educ	exper	female
1.1314	11	2	1
1.1756	12	22	1
1.0986	11	2	0
1.7918	8	44	0
1.6677	12	7	0
2.1691	16	9	0
2.4204	18	15	0
1.6094	12	5	1
1.2809	12	26	1
2.9003	17	22	0
1.8326	16	8	1
2.0956	13	3	1
2.1713	12	15	0
1.7047	12	18	0
3.1001	12	31	0

Practical Exam
Introductory Econometrics
Semester IV, II Year
Set A

Max Marks – 20 **Duration – 3 Hours**

Instructions

1. Save your file with your first name, @ and university roll number. (Example – Saundarya@4129448131)
2. Save the file on the desktop.
3. All questions are compulsory.
4. Viva carries 10 marks.

Q1. Run a simple linear regression. Present the population regression function first and then the estimated model. Interpret the coefficients, overall explanatory power of the model and test the individual coefficients to see if they are significant or not. (8)

Dependent variable – Umbrellas sold Independent variable - Rainfall

Rainfall (mm)	Umbrellas sold
82	15
92.5	25
83.2	17
97.7	28
131.9	41
141.3	47
165.4	50
140	46
126.7	37
97.8	22
86.2	20
99.6	30
87	14
97.5	27
88.2	14
102.7	30
123	43
146.3	49
160	49
145	44
131.7	39
118	36
91.2	20
104.6	32