Question 1/ what is econometrics for Finance?

Question 2/ what is the Multiple Linear Regression Model?

Question 3/ explain the Types of data in Econometrics, and describe each of them in summery.

Question 4/ what are the conditions for using multiple linear regressions?

Question 5/ what are the steps for analyzing data using multiple linear regressions?

Question 6/ explain the statistical criteria in multiple linear regression analysis.

Question 7/ explain the Standard tests in multiple linear regression analysis.

Question 8/ The following function represents the demand for money (Yi) as the dependent variable and (X1) the interest rate (X2) the tax rate (X3) investments as the independent variable:

Explanation of the following function:

$$\hat{Y}_i=0.93 + 0.32\ X_1 + 0.42\ X_2 + 0.83\ X_3$$

$T(b_0)= 3.82$, $T(b_1)= 5.28$, $T(b_2)= 6.52$, $T(b_3)= 3.85$

t.table = 4.62

$R^2 = 0.75$ adjusted $R^2 = 0.68$

Question 9/ what is the Multicollinearity Problem?

Question 10/explain the Source of Multicollinearity Problem.

Question 11/Count of the Source of Multicollinearity Problem.

Question 12/ Count of the Effects of the Multicollinearity Problem.

Question 13/explain the Detection Methods of Multicollinearity.

Question 14/ Count of the solving the Multicollinearity problem.

Question 15/ what is the Autocorrelation Problem?

Question 16/explain the Source of Autocorrelation Problem.

Question 17/ explain the Effects of the Autocorrelation Problem.

Question 18/explain the Detection Methods of the Autocorrelation Problem.

Question 19/ Count of the Solutions of the Autocorrelation Problem.

Question 20/explain the following expressions then give an example for each of them.

1- Multiple Linear Regression Model
2- R-squared and adjusted R-squared
3- Standard deviation
4- Hypothesis
5- t-Test
6- F-Test
7- dependent variable
8- Independent variable
9- β_0 parameter
10- β_i parameter
11- random variable
12- Time series data
13- Cross-section data
14- Panel data:
15- Dummy variable data
16- Klein Test
17- Variation Inflation Factor (VIF) Test
18- Durbin- Watson Test

Question 21/ Write the difference between of the following.

1- Time series data **&** Cross-section data.
2- Simple linear regression model **&** Multi linear regression
3- Dependent variable **&** Independent variable
4- β0 parameter **&** β1 parameter
5- Coefficient of Determination (R^2) & adjusted (R^2)
6- Parameter **&** Observations

7- Yi parameter **&** Xi parameter
8- Criterion of Statistical **&** Standard tests

Question 22/ the following data represent demand for money (Yi), interest rate (X1) and investment ratios (X2). Note that (n = 5).

n	$\hat{b}_0$	$\hat{b}_1$	$\hat{b}_2$	$\sum\hat{y}^2$	$\sum y_i^2$	$\sum x_1 y_i$	$\sum x_2 y_i$	$\sum e_1^2$
5	15.75	-2.25	-0.75	15.75	196	-12	15	0.25

Required:

1- Calculation and Explanation of the coefficient of determination (R^2) and adjusted (R^2).
2- Calculate and Explanation the standard deviation (SD) to determine the degree of confidence of the estimates..
3- Calculated and Explanation t-test for the parameters $\hat{b}1$ and $\hat{b}2$ if that (t-table = 4.302).
4- Calculated and Explanation F-test if that (F-table = 19).

Question 23/ the following data represent the relationship between the volume of imports (Yi) with GDP (X1) and import prices (X2) in a country.

$\sum x_1 y$	$\sum x_2 y$	$\sum y^2$	$\sum {x_2}^2$	$\sum {x_1}^2$	$\sum x_1 x_2$	$\sum ei^2$	n
881	-83	1274	648	650	-112	*72.38*	9

$$\sum X_2 = 954 \qquad \sum X_1 = 1017 \qquad \sum Y_i = 1053$$

Required:

1- Estimate the parameters of this function with the economic interpretation.
2- Calculation and Explanation of the coefficient of determination (R^2) and adjusted (R^2).
3- Calculate and Explanation the standard deviation (SD) to determine the degree of confidence of the estimates.
4- Calculated and Explanation t-test for the parameters $\hat{b}1$ and $\hat{b}2$ if that (t-table = 2.45).
5- Calculated and Explanation F-test if that (F-table = 22).

Question 24/The following data represent the demand for cars (Yi), their price (X1) and the average household income (X2) in selected samples in the city of Erbil.

n	$\bar{Y}$	$\bar{X}_1$	$\bar{X}_2$	$\sum X_1 Y_i$	$\sum X_1$	$\sum X_1^2$	$\sum x_2 y_i$	$\sum x_2^2$	$\sum y_i^2$	$\sum x_1 x_2$
15	9	12	18	917	105	795	38	74	40	-12

Required:

1- Estimation of the demand function and its interpretation in the light of the concept of economic theory.
2- Calculated and Explanation t-test for the parameters $\hat{b}1$ and $\hat{b}2$ if that (t-table = 2.179).
3- Calculated and Explanation F-test if that (F-table = 3.8).

Question 25/ if you had the following data for the estimated demand function for a commodity (Yi) in relation to average individual income (X1) and household size (X2) for nine households:

$$\hat{Y}= 7.8+ 1.51 X_1- 2.03X_2$$

$$t^*= \quad (1.92) \quad (-0.42) \quad t_{table}= 2.447$$

$$R^2y.x_1x_2= 0.95$$

$$F^*=61 \quad F_{table}= 5.14$$

On the simple regression of the demand function (Y)

$$\hat{Y}= 15.8+ 0.84 X_1$$

$$t^* (\hat{b}_1)= 11.8$$

$$R^2y.x_1= 0.95$$

$$\hat{Y}= 45.5+ 6.9 X_2$$

$$t^* (\hat{b}_2)= 9.33$$

$$R^2y.x_2= 0.93$$

Required:

1- Test to detect the Multicollinearity Problem.
2- Take the Klein test.
3- Take the VIF test.

Question 26/ If you know that random (ei) is evaluated for one of the estimators, it is given as below:

-2.1	1.6	-0.5	0.8	-0.2	0.4	1.5	-1.3	1	-0.9	0.3	-0.9	0.2	-1.2	0.4	-1.4	1.7

And if you know that the two tabular values of (du, dl) corresponding to a significant level (5%), two explanatory variables, and (17) observations are (du = 1.53) and (dl = 1.05).

Required:

To find out whether the estimated model suffers from the problem of autocorrelation using the D.W test at a significant level (0.05).

Question 27/ Practical example

The following data represents the demand for the particular commodity (Yi) as the dependent variable, the price of the commodity (X1), the price of the substitute commodity (X2), and the tax rate (X3) as the independent variable.

N	Yi	X1	X2	X3
1	22	8	6	5
2	23	10	7	6
3	18	7	5	4
4	9	2	2	3
5	14	4	3	8
6	20	6	4	11
7	21	7	4	12
8	18	6	5	7
9	16	4	4	5
10	19	9	7	8

Solve the example by EViews software:

1- Estimation Equation and Explanation :
2- Calculated and Explanation :
   - Std. Error
   - t-Statistic
   - R-squared
   - Adjusted R-squared
   - S.E. of regression
   - F-statistic

3 - Test to detect the Multicollinearity Problem.
4- Test to detect the autocorrelation Problem.