BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI

SECOND SEMESTER 2020-2021

ECON F241 ECONOMETRIC METHODS

Assignment **20 marks**

Guidelines:

1. This assignment is worth **20 marks.**
2. This assignment is to be done by a group of **maximum 4 people.**
3. Cite all websites, papers, etc. you may use.
4. You may use Excel, Stata or any other software that you are comfortable with.
4. Assignment is expected to be a concise and brief econometric analysis. Do not make unnecessarily lengthy reports.
5. The report is expected to be in PDF form. **The cover page must contain the names and BITS IDs of all the group members in addition to the problem statement** that you have chosen. If you wish to upload other files, convet everything to a zip file and then submit via the Google form.
5. Try to restrict the content of your report to **4 pages** (not including the cover page).
6. Deadline: **11:59 pm, 30 April 2021.** Failure to meet the deadline will result in a very strict penalty. You can submit early if you want to.

Problem 1 – CarDekho

CarDekho is a company that buys second-hand cars from individuals. It comes up with a valuation for the cars after a thorough inspection. This inspection includes noting down the age of the car, the distance travelled, mileage, engine, maximum power, torque and number of seats. You are given historical data and asked to come up with a model to estimate the selling price of a car. Note that it may not be necessary to include all the inspection metrics.

Problem 2 – Box Office

Before a movie is finalized and put into motion, a cost analysis must be done to predict how much money it will earn at the box office. A leading Hollywood production house has hired you to create a model to predict the box office earnings of movies on the basis of their budget, trailer views etc. Note that it may not be necessary to include all the metrics in the model.

Problem 3 – Forest Fires

Climate change has been causing major natural disasters all over the world. One such issue has been the forest fires in Portugal. The Portugal Department of Forestry has hired you to create a model to predict the burned area of forest fires, in the northeast region of Portugal, by using meteorological and other data. Note that it may not be necessary to include all the metrics in the model.

Deliverables:

You have to create a report which contains the following:

1. Model Development (3 marks)
Select **one of the 3 problems given above** and build a regression model using the variables given to you. Justify as to why you have built this model (which variables you have taken, which variables have been converted to log form etc). You may justify using academic literature on the topic or simply using your knowledge and logical reasoning.

2. Find the coefficients and interpret them. (6 marks)
Calculate the coefficients of the explanatory variables in your model and interpret them. Also calculate the R square and adjusted R square and give their meaning. If you're using Stata, add a screenshot of the analysis. If you're using Excel, add the necessary tables. Any other software, add a screenshot.

3. Conduct F test and t tests. (5 marks)
Clearly write down the hypotheses for these tests and whether you reject them or not. If you're using Stata, add a screenshot of the analysis. If you're using Excel, add the necessary tables. Any other software, add a screenshot.

4. Conduct tests for multicollinearity, heteroscedasticity and autocorrelation (6 marks)
Conduct a characteristic test each for multicollinearity, heteroscedasticity and autocorrelation. Clearly write down the hypotheses for these tests and give your inferences. Give solutions if possible/necessary. If you're using Stata, add a screenshot of the analysis. If you're using Excel, add the necessary tables. Any other software, add a screenshot.