1 Instructions

1.1 Format

Each of you need to be in one and only one 3-member team for the project. The project will be graded according to the following three aspects:

1. Poster Presentation of your work
2. Oral Presentation of your work
3. Accuracy and efficiency of your approach

Each of those three aspects has an equal weight. Each member of the same team will receive the same project mark.

1.2 Due

The poster is due on Tuesday week 13, Dec 1st. The oral presentation and testing of your approach are due on week 14. The exact time for the presentation and testing will be released in week 13.

1.3 Expectation

Your approach should have its roots in Regression analysis. However, your approach need not be something that we have covered in class. It is expected that you read academic articles as well as textbooks. Your poster should summarise important aspects of your research on the problem effectively. Your poster should be easy to read and understand, and is visually appealing. We expect your presentation to be 15 minutes long, followed by a 3-5 minute question and answer session. We **do not expect** you to present all aspects of what you have done during the presentation. However, we expect you as a group to know very well what you have done so that you can explain to us if we choose to ask a question on a different aspect of your solution. During your presentation, we expect to see your approach in action by running your R code. It will be run on our machine with 4G of memory. Your approach should be implemented entirely in R. You may use any existing package. However, it is your responsibility to understand what you are using. Any package you use become a part of your approach, thus is subject to questioning during your presentation. We expect at least 1 hour of work from each student per week to be put into the project.

2 History of Tesla, Inc. (Wikipedia)

On January 29, 2010, Tesla Motors filed Form S-1 with the U.S. Securities and Exchange Commission, as a preliminary prospectus indicating its intention to file an initial public offering (IPO) underwritten by Goldman Sachs, Morgan Stanley, J. P. Morgan, and Deutsche Bank Securities. On May 21, 2010, Tesla announced a "strategic partnership" with Toyota, which agreed to purchase US$50 million in Tesla common stock issued in a private placement to close immediately after the IPO. Executives at both companies said that they would cooperate on "the development of electric vehicles, parts, and production system and engineering support." Less than two months later, Toyota and Tesla confirmed that their first platform collaboration would be to build an electric version of the RAV4 EV. In October 2014, both Daimler and Toyota sold their holdings of Tesla shares with a combined profit of over $1 billion.

On June 29, 2010, Tesla Motors launched its initial public offering on NASDAQ. 13,300,000 shares of common stock were issued to the public at a price of US$17.00 per share. The IPO raised US$226 million for the company. It was the first American car maker to go public since the Ford Motor Company had its IPO in 1956, and by 2014 Tesla had market value half that of Ford. In early 2013, Tesla had problems producing the Model S, and was running out of money. Musk proposed a $6 billion deal with Google, but improved production and a sales push gave Tesla its first profitable quarter, and the deal was abandoned.

During November 2013, Tesla's stock fell more than 20 percent, following news of a third Model S fire. All of those Model S fires had developed several minutes after the cars had struck significant road debris at high speeds and all of the vehicles had provided warnings to the occupants of serious battery damage, advising that an immediate stop was required. All three owners ordered new Model Ss. In the following months Tesla developed a battery protection system as a no-cost retrofit to all Model Ss. No further regulatory action was taken, although there have been a few incidents since, most recently January 2016, with a charging Model S at a Norwegian Supercharger station. Despite the drop, Tesla was still the top performer on the Nasdaq 100 index in 2013. Tesla was seeking to sell 40,000 electric vehicles worldwide in 2014, adding China, Hong Kong, Japan, and Australia to the list of countries where it exports cars, but it later reduced its guidance on sales down to 33,000 units for 2014 in November 2014. As of 2014, Tesla has a US Corporate Average Fuel Economy (CAFE) of 276 mpg.

3 Tasks

Task 1

Read more articles about the company so that you have a better idea what might affect its closing prices. Its historical closing prices can be downloaded from

`https://finance.yahoo.com/quote/TSLA/history/`

Gather data that your model need. Clean and put the data into a tabular format. Produce various exploratory plots for your dataset. You should include at least one graph in your poster, and one graph in your presentation. The whole dataset for this project should NOT exceed 200 megabytes. You are required use only *public available* data/information.

(Insider trading is the buying or selling of a publicly listed company's stock by someone who has non-public material information about that stock. It is a criminal offence, punishable by monetary penalties and imprisonment.)

Task 2

The main task is to predict Tesla's closing price on the five trading days in week 14, i.e.

December 7, 2020 – December 11, 2020

Task 3

Discuss any potential issue that you approach would have if we are forced to working on a very large dataset. (Having 200 gigabytes of data instead of having a 200-megabyte restriction) That is, whatever data you have gathered, imagine you have many more rows.