PMBA6093: Analytics for Managers Project

Project deliverables

(1) 10-min (maximum) presentation recording.

(2) Five page (maximum) project report, excluding code, table, figures, etc.

To be submitted together at the end: (i) a **powerpoint** file of the presentation **(NOT PDF file)**, (ii) a **PDF or Word** file of the final report, (iii) data set used for the project, which can be directly read by `R`, and (iv) `R` code (please make sure that by running the code, all the results in the report can be reproduced).

Objectives

The major goal of this project is to use the ideas and tools for analytics that you have learned in class to help you understand a real and impactful topic in real world business. Your presentation and project report should demonstrate your understanding of your chosen topic. **You should work on the project in groups of 5-6 students (no less, no more).** Projects will be graded by the same standard regardless of group size. Class C and Class D students cannot form groups together. If you have trouble forming groups, please contact the TA within one week of the first day of class for help.

Imagine that the upper management is contemplating to disband your team (although you are managers already;-))and this is your last chance to show how useful you are to the company, in order to save your job. You can choose to do (but not limited to) one of the following things: (i) finding a strategy that will potentially generate positive returns, (ii) demonstrating your ability to help other team/line of business in generating useful information from data to help their business, such as improving customer relationships, marketing strategies, and overall business performance, etc.

The presentation is for your upper management who will decide if you still have a job tomorrow. Your **final report** should contain a report of what you have done, with summaries for a very busy boss who missed your presentation, and with details for an expert consultant (or a professor in Business School) who will read all the details of your report and give an expert opinion to the upper management.

Topics

While you are encouraged to formulate a topic that meets the project objectives on your own, the most straightforward project will be implementing all related methods taught in class on an interesting dataset.

Notes

- It should be relevant. And be ready to defend your reasons.
- It should be more difficult than a homework assignment. I would expect to be more than two homework assignments, in broadness and amount of work.
- A thorough **literature search** is a good starting point for background and to demonstrate the importance of your topic. Also, report what people have done and compare what with you are doing. If you find a paper/work that is very interesting, it is ok to repeat/reproduce the work for your project. But you need at least try a different subset of data and find some angles to be different.
- You need to perform a thorough statistical analysis, using all relevant tools we have discussed. Be ready to explain why you did it and what you learned from the analysis.

- **All references must be properly cited. Plagiarism will not be tolerated.**

Potential Data Resources

- It is encouraged to use your own data, but you can also check out the following resources.
- A great way to get a sense of the current landscape of analytics problems and tools is to look at machine-learning competitions on Kaggle. Due to its highly competitive environment (some contests have thousands of entrants and million dollar prizes) and to the wide variety of machine-learning problems covered, Kaggle offers a realistic way to assess what works and what doesn't.
- Federal Reserve Bank of St. Louis `https://fred.stlouisfed.org/`.
- Wharton research data services `https://wrds-www.wharton.upenn.edu/`.
- Book: Analysis of Financial Time Series: `https://faculty.chicagobooth.edu/ruey-s-tsay/research/analysis-of-financial-time-series-3rd-edition`
- Yahoo Finance.
- Google Finance.
- Tianchi, KDD Cup, AI Challenger
- UCI Machine Learning Repository
- CMU statlib
- Our textbooks

Numerical work

Computer code for your simulation or data analysis should not be included in the main text of your project report, should be attached as a separate file, and does not count towards the five page report limit.

Presentation

Presentations should summarize the contents of your project report. Be prepared to clearly describe the key aspects of your project. What are the most important issues in real world that your project addresses? What are the most important statistical or analytical issues? What are the key strengths and weaknesses of proposed approaches for addressing your topic (if relevant)? This should be a group presentation and **all members of the team** should appear in the presentation. There is no limit on the number of pages of the slides, but the total duration is 10 minutes. Allocate the **first slide to describe the duties/contributions** of all of the group members, include percentage of work, and all of the percentages of different members should be different. **Every member of the team should begin their part by introducing his/her name. Please ensure the name of the presenter is visible in the recording throughout his/her presentation.**

Project report

1. One paragraph describing the duties of all of the group members
2. Section 1: Executive Summary
    - Written to your boss's boss, who does not know statistics.

- Describe your problem, why it is interesting and important, what you have done (data collection, statistical analysis, etc.), and what conclusion you have reached. How to utilize what you have found to benefit the company (you can define what kind of company you are in, to make your work relevant)

3. Section 2: Introduction
    - Describe your problem, why it is interesting, etc. Summarize literature and standard practice. State your approach.
    - The section should end with a paragraph, starting with: The rest of this report is organized as follows. In Section 3, we ...; In Section 4, we ...
4. Section 3: Data
    - Describe your data and how you collected them.
    - Some summary and descriptive statistics - tables and figures
5. Section 4: Analysis
    - Detailed predictive, inferential, or prescriptive analysis: - Show tables and figures. Do not list or show R command.
    - Pay attention to interpretations and explain why each procedure is used, what you have learn from it etc.
6. Section 5: Conclusion
    - State what you have learned. How it will benefit your company etc.
    - If you are given 6 more months to work on it, what will you do. Or things like that. Make the case that the company needs you.
7. **Submission deadline of all deliverables: TBD**

Grading

Please watch all the other recordings from other groups and submit your evaluations as instructed later.