STATS 4A03
- Group Project - Winter 2020 -

Description

Students in STATS 4A03 will be working in **groups** of two or three students and use notions and techniques introduced in class to analyze a time series. Each group will select a dataset from a list posted on the course website, or request approval for an alternative dataset. You will study this dataset and present your findings, as a group, in a written report and through a poster presentation.

Skills Development

- Time series analysis. R programming skills; obtaining, analyzing and interpreting data from a real-world situation.
- Further understanding of statistical analysis and forecasting methods.
- Researching, assimilating resources and applying knowledge to answer a question. Critical thinking and information management.
- Effective research within small groups including task and time management (balancing individual and group activities).
- Improved scientific writing skills. Introductory LaTeX editing skills.
- Communicating research: construction and delivery of a poster presentation to a target audience.
- Improved peer review and critique skills.

Project Deliverables

The **group project deliverables** consist of

- a short report written in scientific journal style
- a poster (presentation)
- project and poster reviews

Both the report and the poster should be aimed at a level-four math and stats undergraduate student audience. The projects require the use of R to perform relevant computations and analysis, plot graphs, and forecast future values. Each group member should bring their own contribution to the project in a responsible and collegial manner. In an **individual contribution form**, which is to be completed at the end of the project, you will be asked to summarize the contribution of each of your group members and evaluate the strengths and weaknesses of the team. While the project grade is primarily a *group grade*, **individual grades** will be adjusted based on *your own contribution and your peer assessments*.

Time management is going to play an important role in the project. Create and follow a schedule that enables your group to successfully complete all written deliverables.

Report

Each group will write a short paper in **formal scientific style**. In your report you will

(1) select class of time series models that is appropriate to the observed data and propose a model based on statistics computed from data as well as on any additional knowledge of the subject matter in which data arises;
(2) fit the model to data by finding the best possible estimates of the model's parameters from the observed series;
(3) assess critically the quality of the proposed model by testing how well the assumptions reflect the given data;
(4) for unsuccessful models, redefine the model, steps (1)–(3), based on the inadequacies found;
(5) use a successfully developed model to forecast future values and interpret the results.

You will have to use R to carry out the model building and analysis, and you will have to clearly document and discuss the steps (1)–(5) outlined above. The report should be from 5 to no more than 10 double-spaced single-column pages using a font size 10-12, not including images and graphs.

Poster

Each group will make a poster that summarizes their analysis and forecast. The posters are to be submitted/presented in electronic format and are not to be printed. The dates for the poster presentation are tentatively set for April 2-7, 2020 during class time and are subject to adequate room availability.

Review & Feedback

Manuscript submission and review is a big component of real-life research. Each group will receive one report and one poster to review. As a reviewer, you should consider what was done well, as well as areas for improvement, with suggestions for achieving such improvements. Be certain to write your review in a constructive manner that helps the authors improve their report and poster. Each group can revise their report and poster based upon the comments and critique provided by the peer reviews. You may feel not all content from the reviews is valid. Incorporation of comments, additions and suggested improvements is at your discretion. The version of the report and poster that is submitted, **after you have seen your peer reviews**, will be the version that is assessed for your final project grade.