

Predictive Analytics 2021

Individual Assignment (20%)

Due Date: 16 August 2021 @ 9PM

In the past decade, the debate on climate change has received increasing attention due to concerns of the effects of global warming on future generations. Climate change, by definition, is the change in the average weather pattern over time. Temperature is often used as a quantity that signifies this change. In this assignment you will be exploring Melbourne's weather patterns and provide a data-driven analysis of climate change based on the given data set.

“MonthlyTemp.csv” contains monthly data of the following time series:

- The average daily maximum temperature over a particular month (column C)
- The average daily minimum temperature over a particular month (column D)
- The highest temperature over a particular month (column E)
- The lowest temperature over a particular month (column F)

All series are observed at a weather station located at the Melbourne Airport. The data ranges from July 1970 to June 2021. Explore the data set and provide an analysis of whether there is evidence of global warming based on your analysis.

You may consider (but not limit yourselves to) the following aspects of the analysis:

- Graphical exploration of the data.
- Time series decomposition of the data.
- Regression analysis.
- Forecast evaluation.
- Predictions quantities of interest outside of the data sample.

Provide your analysis in a report that is aimed at readers who are literate, but not necessarily an expert, in statistical analysis. Your report should include the following items:

- Executive summary.
- Discussions of the issues on hand and any exploratory data features.
- Technical analysis - a succinct description of your technical analysis process.
- Discussion of key results - a summary of the results, with relevant statistics appropriately summarized in table formats.
- Conclusion and limitations.

Things to note:

- The report should have at least 2cm margins on all sides, and be written in 12pt font size with at least 1.5 spacing.
- Tables of results and any graphical outputs that aid your discussions may be included in an appendix (**not to exceed 6 pages**).
- You do not need to include every single outputs that are produced as part of your analysis, but summarize the relevant ones.
- Screenshots of R-output is not an acceptable form of result presentation. If you choose to report any estimates/statistics, they must be properly presented in equation or table formats.
- Note that the appendix will only be looked at if they are referred to. Make sure that sections of the appendix are marked and referred to in the body of your report if you choose to put your key results in the appendix.
- Remember that this is an individual assignment, which must reflect **your own approach** to model construction and predictive assessments. **Plagiarism of any form is treated as a serious academic misconduct.**