Recommendation of the Outline of the Report

* Especially the Analysis Part

1. Introduction, Theme, & Motivation
2. From daily life, it seems if today is warm, then tomorrow is also warm. (a correlation between the temperature of today and tomorrow
3. However, it could also be that today and tomorrow are in the same “season”, it is purely due to the seasonal effect
4. Question is: aside from the seasonal effect, is there a correlation between today’s temperature and tomorrow’s?
5. Further, if we know historical data, can we make a forecast of future temperature better than simply using the seasonal effect?
6. Data
7. From Climate Canada, temperature, time, station…
8. Ke Miao’s fancy code paste here
9. Say that we decided to use na.fill() to deal with NA problem
10. Analysis (write some formula when necessary)
11. Decomposition, get the seasonal effect, adf test stationary – little conclusion: the seasonal effect is very obvious
12. Get acf, pacf, periodogram – little conclusion here, we see that aside from the seasonal effect, there is still a correlation between consecutive days
13. We aim to use the historical data to forecast future data, split it into training and testing. Here use Box-Jenkins. Compare AIC to find best ARMA model
14. Try to forecast, also just use just the seasonal way. Compare the two. – little conclusion: the two ways are really just very similar
15. Now we just trying to forecast **1 day** **in the future**, see whether knowing historical data would be useful. Run thousands of ARMA models – little conclusion: knowing historical data works better in abnormal cases.
16. Conclusion
17. Despite strong seasonal effects, correlation exists
18. Knowing recent data for long-term forecast is futile
19. Knowing recent data for short term is useful when the temperature is abnormal
20. Get some intuitive explanation, e.g. of course when there is a big snow for several days, knowing recent data would be helpful.

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