MDM4U   Summative Project: Statistical Analysis

The **FINAL REPORT** should be formal and include a title page, and a bibliography. Your final report should read as a **formal essay** with pictures (your graphs). This is where you put the three phases you worked on throughout the semester, in one continuous report. Take the time to improve your analysis based on the feedback you have received about your research and analysis.

Introduction:
- ☐ Describe the interest in the topic
- ☐ Explain why you selected your variables (the dependent and independent variables are clearly defined)
- ☐ The hypothesis is clearly stated and justified
- ☐ Explain why you expected the thesis to be true
- ☐ Additional background information is used to introduce the research question

Data Collection (you should be able to get this from the data source)
- ☐ The source of the data is provided and sufficient data are collected
- ☐ The sampling technique is described and clearly justified
- ☐ Sources of sampling bias are identified
- ☐ The data are represented using appropriate charts and graphs

Data analysis:
- ☐ The measures of central tendency are calculated and interpreted clearly
- ☐ The measures of spread are calculated and interpreted clearly
- ☐ The appropriate tests have been done for outliers
- ☐ Relevant z-score calculations are included and explained
- ☐ The impact of any outliers on the results is thoroughly analyzed
- ☐ For the regression analysis
    - o All relevant models of best fit are explored, discussed and reported
    - o The most appropriate model is chosen and justified
    - o The r and/or r^2 values are reported and explained
    - o A scatter plot shows the line/curve of best fit and the impact of potential outliers

Evaluating Your Results/Conclusion:
- ☐ Sources of bias (beyond sampling bias) are examined and discussed
- ☐ Conclusions are reported and justified
- ☐ Include reflections on the methodology and improvements for future studies
- ☐ What you found out about your topic
- ☐ Discuss whether you proved your thesis or not and how you know if your thesis was correct
- ☐ what you'd do different if you had time to research this further
- ☐ what you learned
- ☐ would you make an inference to a larger population based on your findings

Overall guidelines:
- ☐ References are appropriately sourced
- ☐ Paste your graphs into Word
- ☐ A discussion should accompany all graphs (i.e. graphs should not be 'stand alones'. They need to be incorporated into your argument)
- ☐ Each page should balance use of graphs and text
- ☐ Summarise the trends that you notice in each graph
- ☐ Explain the meaning of your mathematical calculations and explain how your graphs supports (or refutes) your thesis

Final Report Rubric:

	Level 1 50 - 59 Beginning	Level 2 60 – 69 Developing	Level 3 70 – 79 Meets	Level 4 80 – 100 Exceeds
Topic Question and Introduction	Hypothesis stated, but not clear or justified Background knowledge stated to a limited extent	Hypothesis makes sense but could be more clear Background knowledge somewhat evident	Clear hypothesis Background knowledge evident	Clear, justified hypothesis Background knowledge clearly evident and extensive
Data Collection and Sampling Method Understands methods for collecting and validating data	Insufficient data collected Data limited to one element of the course Inadequate validation of the data source	Some data collected Data limited to few aspects of the course Some validation of the data source	Sufficient data collected Data mostly appropriate to the task Adequate validation of the data source	Extensive data collected Data appropriate to the task In-depth validation of the data source
Mathematical Understanding Calculations and data analysis	Reflects limited mathematical understanding	Sometimes reflects mathematical understanding	Generally reflects mathematical understanding	Reflects thorough mathematical understanding
Data Analysis Central Tendency Spread Outliers Regression Graphs	Statistical tools incorporated to a limited extent Limited use of appropriate mathematical procedures	Statistical tools incorporated sometimes Mathematical procedures sometimes appropriate and sometimes correct	Statistical tools incorporated most of the time Mathematical procedures generally appropriate/correct	Statistical tools incorporated extensively Mathematical procedures always appropriate/correct and highly detailed
Conclusions, Assumptions, Limitations and Reflection	Identifies few assumptions, limitations, or ideas for future study Conclusions supported minimally by the mathematical analysis and reasoning	Identifies some assumptions, limitations, or ideas for future study Conclusions somewhat justified by the mathematical analysis and reasoning	Identifies many assumptions, limitations, and viable ideas for future study Conclusions generally justified and supported by the mathematical analysis and reasoning	Assumptions, limitations, thoroughly discussed; detailed suggestsions for future study Conclusions consistently justified by the mathematical analysis and reasoning
Math Terminology and Writing Conventions Uses proper math conventions for graphs, calculations, tables, etc. Uses proper writing conventions	Limited use of correct math terminology and notation Proper writing conventions followed to a limited extent	Some use of correct math terminology and notation Proper writing conventions followed sometimes	Considerable use of correct math terminology and notation Proper writing conventions mostly followed	Thorough and meticulous use of correct math terminology and notation Proper writing conventions followed extensively
Organization Key ideas presented logically	Report not clear or logical; ideas rarely connect Few aspects are organized Some references included Sources cited incorrectly	Report somewhat clear or logical; ideas connect sometimes Some aspects are organized Some references missing Sources cited mostly using proper format (few errors)	Report mostly clear, logical; ideas mostly connect Many aspects are well organized All references included Sources cited mostly using proper format (few errors)	Report clear, logical; ideas thoroughly connect Most aspects are well organized All references included Sources cited mostly using proper format