MIS771 Descriptive Analytics and Visualisation

DEPARTMENT OF INFORMATION SYSTEMS AND BUSINESS ANALYTICS
DEAKIN BUSINESS SCHOOL
FACULTY OF BUSINESS AND LAW, DEAKIN UNIVERSITY

Assignment One

Background

Assignment one is an **individual** assignment with three tasks. The first task is to report on how to plan and deliver the assessment task on time. The second task is to analyse the given dataset and then interpret and draw conclusions from the analysis. Finally, the third task is to convey the findings and conclusions in a written report to a business professional with very little or no knowledge of Business Analytics.

Percentage of the final grade	30%
The Due Date and Time	**8.00 PM Thursday 19th August 2021**

Submission instructions

The assignment must be submitted by the due date electronically in CloudDeakin. When submitting electronically, you must check that you have submitted the work correctly by following the instructions provided in CloudDeakin. Please note that we will NOT accept any paper or email copies or part of the assignment submitted after the deadline.

Information for students seeking an extension BEFORE the due date

If you wish to seek an extension for this assignment before the due date, you need to apply directly to the Unit Chair by completing the Assignment and Online Test Extension Application Form (PDF, 188.6KB). Please make sure you attach all supporting documentation and a draft of your assignment.

This needs to occur as soon as you become aware that you will have difficulty meeting the due date.

Please note: Unit Chairs can only grant extensions up to **two weeks** beyond the original due date. If you require more than two weeks or have already been provided with an extension and require additional time, you must apply for Special Consideration via StudentConnect within three business days of the due date.

Conditions under which an extension will usually be considered include:

- **Medical** – to cover medical conditions of a severe nature (e.g. hospitalisation, serious injury or chronic illness.)

  Note: temporary minor ailments such as headaches, colds, and minor gastric upsets are not severe medical conditions and are unlikely to be accepted. However, severe cases may be considered.

- **Compassionate** (e.g. death of a close family member, significant family and relationship problems.)
- **Hardship/Trauma** (e.g. sudden loss or gain of employment, severe disruption to domestic arrangements, a victim of crime.)

Note: misreading the due date, assignment anxiety or returning home will not be accepted as grounds for consideration.

Information for students seeking an extension AFTER the due date

You must apply for Special Consideration via StudentConnect. Please be aware that applications are governed by University procedures and must be submitted within three business days of the due date

or extension due date. Additionally, please be aware that in most instances, the maximum amount of time that can be granted for an assignment extension is three weeks after the due date, as Unit Chairs are required to have all assignments submitted before any results/feedback can be released back to students.

Penalties for late submission

The following marking penalties will apply if you submit an assessment task after the due date without an approved extension:

- 5% will be deducted from available marks for each day, or part thereof, up to five days.
- Work that is submitted more than five days after the due date will not be marked; you will receive 0% for the task.

Note: 'Day' means calendar day.

The Unit Chair may refuse to accept a late submission where it is unreasonable or impracticable to assess the task after the due date.

Additional information: For advice regarding academic misconduct, special considerations, extensions, and assessment feedback, please refer to the document "Rights and responsibilities as a student" in the "Unit Guide and Information" folder under the "Resources" section in the MIS771 CloudDeakin site.

The assignment uses the dataset file ***T22021A1.xlsx,*** which can be downloaded from CloudDeakin. Analysis of the data requires the use of techniques studied in Module-1.

Assurance of Learning

This assignment assesses the following Graduate Learning Outcomes and related Unit Learning Outcomes:

Graduate Learning Outcome (GLO)	Unit Learning Outcome (ULO)
GLO1: **Discipline-specific knowledge and capabilities** - appropriate to the level of study related to a discipline or profession. **GLO2**: **Communication -** using oral, written and interpersonal communication to inform, motivate and effect change **GLO5: Problem Solving** - creating solutions to authentic (real world and ill-defined) problems. **GLO6**: **Self-Management** - working and learning independently, and taking responsibility for personal actions	**ULO 1**: Apply quantitative reasoning skills to solve complex problems. **ULO 2**: Plan, monitor, and evaluate own learning as a data analyst. **ULO 3**: Deduce clear and unambiguous solutions in a form that they useful for decision making and research purposes and for communication to the wider public.

Feedback before submission

You can seek assistance from the teaching staff to ascertain whether the assignment conforms to submission guidelines.

Feedback after submission

An overall mark, together with feedback, will be released via CloudDeakin, **usually within 15 working days**. You are expected to refer and compare your answers to the feedback to understand any areas of improvement.

The Case Study for Data Analysis and Business Report

You are a data analyst in the Research and Analysis group at *Financial Review Magazine*. Your primary role is to evaluate new products and services. You are often required to report outcomes of your analysis to senior editors at the Magazine who have little or no knowledge of data analysis.

Of specific interest to *Financial Review* magazine is the increasing number of companies that offer brokerage services for car insurance and potentially what this means for consumers. **An insurance broker is an independent insurance agent who works with many insurance companies to find the very best available policies for his or her customers.** Most of these brokers advertise that they can save vehicle owners hundreds of dollars each year on insurance premiums.

Your research and analysis group recently secured a dataset from the Insurance Brokers Association (IBA). It is **a random sample of 400 customers** who obtained the services of car insurance brokers.

Your Manager – Edmond Kendrick, has asked you to analyse the collected data. In particular, you are expected to perform a series of descriptive and inferential analyses and produce a report based on your findings.

Edmond's email to you is below.

To: <<Your Name>>
From: Edmond Kendrick
Subject: Analysis of car insurance brokerage service

Hi,

As discussed earlier, I got one of the IT colleagues to clean and simplify the dataset for your convenience. The cleaned dataset contains information about 400 randomly selected customers, and I have the following questions/issues relating to the insurance brokers data.

1. Do female drivers under 30 save more on car insurance premiums than their male counterparts, on average?
2. Is the proportion of dissatisfied urban customers smaller than the proportion of dissatisfied rural customers?
3. Does the average savings on car insurance premiums differ across the two valuation methods?
4. I would also like you to analyse whether:
    a. The average savings on insurance premiums significantly differ across NSW, Victoria, and Queensland.
    b. The proportion of satisfied customers differ across the insurance brokers.
5. I would like you to design and run an experiment to see the effect of the valuation method and the vehicle type on savings on insurance premium using the data set in the attached Excel File – use Data in the "Experiment" worksheet.

I look forward to your response on or before 19th August 2021.

Sincerely,

Eddie

SUBMISSIONS

The assignment consists of **three** parts: **Assignment Planning and Execution Tables, Analysis and Report.** You are required to submit all three (your plan, data analysis and written report).

1. Guidelines for Assignment Planning and Execution Tables

The purpose of this practical task is to help you keep track of your progress with the assignment and submit it on time. To report how you plan your assignment and turn the plan into action, you must complete the tables provided in dot points as clearly as possible. Remember, effective planning, execution, and completing given tasks on time are essential self-management skills.

> **Note**: Dot point writing requires you to use 'point form', not complete sentences.

The assignment planning and execution details should be submitted in the appropriate tables provided. The tables should be in dot points. Before filling in the tables, students are strongly encouraged to watch the pre-recorded workshop called 'How to plan an assignment and turn the plan into action?' by the Language and Learning Adviser.

> **Note:** Give the assignment planning and execution file the following name
> **A1_Planning_YourStudentID.docx**

2. Guidelines for Data Analysis

Read the case study and questions asked by Edmond carefully. Then spend some time reviewing the data to get a sense of the context. The analysis required for this assignment involves material covered in **Module 1,** with the corresponding tutorials being a useful guide.

The analysis should be submitted in the appropriate worksheets in the Excel file. Each question from the email should be analysed in a separate tab (e.g. Q1, Q2 … or Q3.1, Q3.2 …). You need to add these extra tabs. Before submitting your analysis, make sure it is logically organised, and any incorrect or unnecessary output has been removed. Marks will be penalised for poor presentation or disorganised/incorrect results, or any unnecessary output.

For all questions in the email, you can assume that:

- **95 % confidence level** is appropriate for confidence intervals and;
- **5.0 % level of significance** (i.e. $\alpha = 0.05$) is appropriate for any hypothesis tests.

You can complete all data analysis using the Excel templates provided in practicals. In choosing the technique to apply for a given question, keep the following in mind:

- Are we dealing with a numerical variable or categorical variable?
- Are we dealing with one sample, two samples or more than a two-sample situation?
- Are we dealing with independent samples or a paired-sample situation?
- Each question must be answered using the most appropriate technique and justify your decision where applicable.
- For relevant questions, please formulate your hypotheses, and state them clearly in both notation and words in your Excel file.
- Even though a question(s) may lead you to inferential techniques, consider conducting a descriptive analysis of the sample data first.

ATTENTION!

- If you have established a difference between two means or proportions, we expect you to estimate and report the difference.
- If you have established a difference between two or more means or proportions, we expect you to follow up with an appropriate multiple comparison procedure.

You may need to make certain assumptions about the dataset to answer some questions. There will be technical/statistical assumptions that you need to make, for example, whether to use an equal or an unequal variance test. *You need to consider and incorporate any violations of assumptions such as unequal sample sizes as limitations of your analysis in the report.*

Note: Name your Excel file in the following format **A1_*YourStudentID*.xlsx** (use a short file name while analysing).

3. Guidelines for the Business Report

Once you have completed your data analysis, you need to summarise the key findings for each question and write a response to Edmond in a report format. Your business report consists of four sections: **Introduction**, **Main Body**, **Conclusion**, and **Appendices**. The report should be around 1,500 words.

Use proper headings (e.g. Q1, Q2 … or Q3.1, Q3.2…) and titles in the report's main body. Use sub-headings where necessary.

- Include relevant Excel outputs, including templates, tables, charts, and graphs **in *Appendices*** (appendices are not included in the word count).
- Ensure these outputs in the Appendix are **visually appealing,** have a **consistent formatting style** and **proper titles** (title, axes titles, etc.), and are **numbered correctly**. Where necessary, refer to these outputs in the main body of the report. If an output, graph or chart is not referred to in the report body, do not include it in your Appendix.
- **The introduction** begins by highlighting the main purpose(s) of the analysis and concludes by explaining the structure of the report (i.e., subsequent sections). **The conclusion** should highlight the key findings of the analyses and **explain the main limitations** (if any).

When you have completed the report, it is a useful exercise to leave it for a day, return to it and then re-read. Does it flow easily? Does it make sense? Often, on re-reading, you become aware that you have made some points clumsily, and you find that you can re-phrase them much more clearly.

Note: Give the report the following name **A1_*YourStudentID*.docx** or **pdf.**

Rubric

PERFORMANCE	YET TO ACHIEVE MINIMUM STANDARD		MEETS STANDARD		EXCEEDS STANDARD	
Criteria	Not Attempted	Needs Improvement	Satisfactory	Good	Very Good	Exemplary
Analysis (Marks: 35%) ***GLO1*** ***GLO5***	Explores topic at a surface level and rarely uses appropriate data analysis tools. 0 – 10.4	Explores topic at a limited level and often uses irrelevant or inappropriate techniques to analyse data and/or there are many errors in the analysis. 10.5 – 17.4	Independently pursues substantial knowledge, explores topics in some depth and uses appropriate descriptive analysis and visualisation tools to analyse the data but there are some errors in the analysis. 17.5 – 20.9	Independently pursues substantial, additional knowledge, explores a topic in depth yielding mostly rich analysis of the data using appropriate techniques but there are minor errors in the analysis. 21 – 24.4	Learning interests exist outside classroom requirements. Explores a topic in depth and produces a very comprehensive analysis of the data using most appropriate techniques. Consistent use of correct Inferential analysis methods to answer questions. 24.5-27.9	Learning interests exist and flourish outside classroom requirements. Explores a topic in depth and produces a skilful and comprehensive analysis of the data using many different techniques. 28-35
Interpretation (Marks: 45%) ***GLO1*** ***GLO2***	Does not communicate any of the main findings of the analysis in an accurate or useful way. Provide no insight and/or information beyond basic facts. 0 – 10.4	Interpretation and communication of findings is at a basic level or does not adequately explain the main findings of the analysis. Provide little insight and/or information beyond basic facts. 10.5 – 17.4	Explains most of the main findings of the analysis accurately. Shows evidence of independently applying learning to demonstrate comprehension in familiar and novel situations. 17.5 – 20.9	Provides a reasonable and accurate description of the most important features of the analysis along with appropriately qualified conclusions. Shows evidence of independently and creatively applying learning to demonstrate comprehension in familiar and novel situations. 21 – 24.4	Provides a very detailed and accurate description of the most important features of the analysis in appropriate language. Report clearly addresses main research questions asked in the assignment. Shows evidence of independently and creatively applying learning to demonstrate high level of comprehension in familiar and novel situations. 24.5-27.9	Provides an outstanding descriptions and inference of results. Conclusions are explained in clear language and insightful. The entire report is aimed to address main research questions. All assumptions / limitations are communicated. Shows evidence of independently and expertly applying learning to demonstrate outstanding level of comprehension in familiar and novel situations. 28-35
	The business report is poorly structured and/or few sections missing with a poor use of language. 0 – 2.9	The business report is poorly structured. Only few analysis outputs are presented in Appendix. Language is difficult to follow with many grammatical errors noted. 3 – 4.9	The business report is clear and easy to follow. The 3 main elements of a well- structured statement (i.e., claim + evidence + conclusion) is considered across the entire report. 5 – 5.9	The business report is well-structured with All sections included. All relevant analysis outputs are included in Appendix. Communication is clear with NO grammatical errors noted. 6– 6.9	The business report is on par with a professional report. All relevant analysis outputs are presented in Appendix in a logical order. Written communication is clear, easy to follow and has a structure. 7 – 7.9	The business report is masterfully structured. All relevant analysis outputs are included in Appendix. Outputs are visually appealing, and follow a consistent formatting style. Language is truly professional and easy to follow. 8 – 10
Assignment Planning and Execution (Marks: 20%) ***GLO 6***	Takes no responsibility for maintaining accurate evidence of learning achievements from within formal course experiences. 0 – 5.9	Takes little responsibility for maintaining accurate evidence of learning achievements from within formal course experiences. 6 – 9.9	Takes responsibility for seeking improved learning and maintaining evidence of learning achievements from within formal course experiences, although there is some inconsistency in application. 10 – 11.9	Consistently takes responsibility for seeking improved learning and maintaining evidence of learning achievements from within formal course experiences. 12 – 13.9	Consistently takes responsibility for maintaining accurate and detailed evidence of learning achievements from within and beyond formal course experiences. 14 – 15.9	Consistently takes responsibility for maintaining accurate and compelling evidence of learning achievements from within and beyond formal course experiences. 16 – 20
Overall Description	Or Equivalent Fail (N) 0 – 49%		Or Equivalent Pass (P) 50% – 59%	Or Equivalent Credit (C) 60% – 69%	Or Equivalent Distinction (D) 70% –79%	Or Equivalent High Distinction (HD) 80% –100%