

FACULTY OF BUSINESS AND LAW

Department of Information Systems and Business Analytics

MIS770 – Foundation Skills in Data Analysis



Assignment 2 – Regional Business Confidence

Particulars

- **Marks:** 30%
- **Submission:** Online to the MIS770 assignment two drop box in CloudDeakin no later than 11:59pm on the 9th of May 2019. Email submissions will not be accepted
- **Submission Files:** Two files. One Excel (.xlsx) file with the results of your analysis. One Word (.docx) file (no more than 2 pages) with your written responses to each question.
- **Note:** This assignment is to be completed individually

Assurance of Learning

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

Graduate Learning Outcome (GLO)	Unit Learning Outcome (ULO)
GLO4: Critical thinking: evaluating information using critical and analytical thinking and judgment	ULO2: Manipulate and summarise data that accurately represents real world problems ULO3: Interpret and appraise statistical output to assist in real-world decision making

Overview

The purpose of this assignment is to investigate a dataset which will enable you to answer questions posed in an email. In order to answer the questions posed in the email, you will need to analyse data, interpret the results, and then draw appropriate conclusions.

The aims of the assignment are to:

- provide you with some examples of the application of data analysis
- test your understanding of the material presented in the relevant topics
- test your ability to analyse data and interpret your results
- test your ability to effectively communicate your results to others

Before attempting the assignment, make sure you have prepared yourself well. At a minimum, please read the relevant sections of the prescribed textbook and review the materials provided in Modules 1 and 2.

Scenario

You are Nick Black, a specialist analyst for Business Intelligence (BI). BI are data analytics research service consultants that provide data modelling solutions to large organisations and governments, as well as supporting various niche research projects across a variety of industry sectors.

Australian rural communities make a considerable contribution to the Australian economy yet very little research has been done on the specific business communities that support the rural sector. For example, little is known about the market place confidence and expectation of businesses that exist in the townships that support these rural communities.

BI has been contracted because some rural municipal authorities have identified a need to focus expenditure and related activities to assist in business growth. One such municipal authority is the Ballarat City Council. In an effort to understand the marketplace confidence of the Ballarat businesses that support their local community, BI has taken a random sample of 150 businesses in the region. As well as asking them for useful demographic characteristics, BI have asked questions about trading patterns, business confidence and business expectations. You have received an email from the Ballarat City Council that contains specific questions that you must answer.

To: Nick Black

From: Ballarat City Council

Subject: Further analysis of Business confidence and expectation

Dear Nick,

With the exception of the first question, in which I only require a summary of the sample data, please provide conclusions for **all** of our regional businesses. That is, I have been led to believe that because your data was collected randomly, you can use your dataset to make inferences about all of our regional businesses. With that in mind, I hope you are able to assist me.

1. Can you provide an overview of the number of people that local businesses employ in our region?
2. Can you estimate the proportion of all businesses in our region that do have a growth strategy?
3. The Creswick/Clunes Chamber of Commerce recently indicated that the proportion of businesses registered in their region that do have a growth strategy was 76%. They then went on to suggest in a confidential report that any proportion less than this value contributed to a significant reduction in the revenue generated in the region.
 - a. Is there any evidence to suggest that the proportion of our local businesses that do have a growth strategy could be less than this suggested figure and thus impacting on revenue in our region?
 - b. Can you estimate the average number of staff for businesses with and without a growth strategy and can we therefore conclude that businesses with a growth strategy have a higher number of employees on average, and might therefore be more successful?
4. I have been told that our local business managers are rather young. This seems at odds with a recent report that stated the average age of managers in Australian businesses was 50 years of age. Can you please determine if the average age of our local business managers is indeed less than 50 years?
5. Over the years we have observed that an average of 10 businesses open each year. What is the likelihood that next year:
 - a. More than 15 businesses will open?
 - b. The number of businesses that open will be 5 or less?
6. Finally, when we conduct this survey again next year, we would like to be able to:
 - a. Estimate the average number of people that local business employ to within 4 employees, and,
 - b. Estimate the percentage of business with a growth strategy to within 2%.

Are you able to advise us on the sample size required that satisfies both these criteria? I look forward to your response.

Sincerely,

Ballarat City Council

Comment on the data provided

Many variables within the data set are recoded both numerically and categorically.

Guidelines for Data Analysis

The analysis required for this assignment involves materials covered in Modules 1 and 2. The corresponding seminars will also provide useful materials. Note that many variables included in the data set are represented using both numbers and text.

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

- a 95% confidence level is appropriate for confidence intervals and
- a 5% level of significance (that is, $\alpha = 0.05$) is appropriate for hypothesis tests.

Although questions can be completed using Excel (for example using the templates presented in the MSXL worksheets in your tutorials), **we strongly recommend** that you do the analysis using a pen and paper approach too, as this will help you confirm your results and **give you greater insight into the examination.**

- Before doing any analysis, classify your data as numerical or categorical.
- Most questions will require you to complete either a confidence interval or a hypothesis test. Go through each of the questions asked by the Ballarat City Council and decide which technique is the most appropriate.

Below are some hints regarding the most appropriate technique:

- Do we have to make an estimate, and therefore need a confidence interval?
- Are we testing a theory or claim, and therefore need an hypothesis test?
- To answer some questions you may need to make certain assumptions about the dataset we are using.
- For Question 5, you will need to calculate the probability using an appropriate probability distribution table. You could then use Excel to confirm your answer. You do not need the *MIS770 A2 Business Confidence Data.xlsx* dataset to answer this question.

You written response requirements

- Your written response should be no longer 2,000 words (the approximate equivalent). Do not include a Table of Contents, Charts and Tables, nor Appendices in your written response.

- **A 2,000 word or approximate equivalent equates to 2 files that you will submit:** The (summary Excel) output you generate, which is to be placed **ONLY** in the Data Analysis file you submit, **AND** a Word document file response, which should be **NO MORE** than two pages.

- Suggested Word formatting for the Memorandum: Single-line spacing; no smaller than 10-point font; page margins approx. 25mm, and good use of white space.
- Your written response must have a cover sheet containing your particulars and Unit details.
- **Set out your written response in the same order as in the originating email** from Nick Black, with each section (question) clearly marked. There is **NO MINIMUM** word count.
- **Use plain language and keep your explanations simple, clear and succinct.** Avoid the use of technical or statistical jargon. As a guide to the meaning of "Plain Language", imagine you

are explaining your findings to a person without any analytical training (e.g. someone who has not studied this unit). What type of language would you use in this case?

- Marks will be lost from your written response if you use technical terms, poor grammar, present irrelevant material, or have poor presentation/organisation.
- In your written response, you should use key summary measures to make your conclusions, however, do not refer your reader to the diagrams that your .xlsx file contains. That is, your written response needs to be a stand-alone document.
- All Microsoft Excel output associated with each question in your written response is to be placed in the corresponding spreadsheets (Q1, Q2 ... etc) in your submitted Microsoft .xlsx file.

Submission

Your completed assignment should be submitted in two separate files:

- **FILE 1: Data Analysis.** An Excel document (i.e. the MIS770 A2 Data.xlsx file you used) containing separate tabs/worksheets with charts/tables/graphs for each question. Please note that all interpretations should be presented in your “Memorandum” and the Excel document should only contain your intermediate analysis and final output.
- **FILE 2: Memorandum.** A Word document of no more than 2 pages which **does not** contain, nor specifically refer to, any of the charts/tables/graphs presented in your analysis.

Please name your Word document ***yourstudentid.docx*** and the Data Analysis file ***yourstudentid.xlsx***.

Note: The Cloud Unit site is the ONLY method of submission acceptable.

Extensions

Extensions will only be considered if your draft assignment is attached with your request for an extension to the Unit Chair, Dr Scott Salzman [scott.salzman@deakin.edu.au], (this will indicate your progress to date), and documentary evidence for the extension is provided. Applications after the due date will not be accepted and submissions after this date/time, without an approved extension, will be considered late and subject to penalties.

Extensions are only granted in extreme circumstances, such as ongoing health, personal hardship or work-related problems. Temporary illnesses, normal work pressures, multiple assignments due at the same time, failure to keep backups, technology failure, etc. are **not** reasons for an extension.

Notes

Penalties for late submission: The following marking penalties will apply if you submit an assessment task after the due date, without an approved extension. Five percent (5%) will be deducted from the available marks for each day (or part thereof) for up to five days, and work that is submitted more than five days after the due date will not be marked and you would receive 0% for this assessment. As this assignment is worth 30 marks (i.e. 30% of your overall mark), each day late, or part of a day, will mean a loss of 1.5 marks. 'Day' means calendar day for electronic submissions. The Unit Chair may refuse to accept a late submission where it is unreasonable or impracticable to assess the task after the due date.

For more information about academic misconduct, special consideration, extensions, and assessment feedback, please refer to the document “Your rights and responsibilities as a student in this Unit” in the first folder next to the Unit Guide of the Resources area in the CloudDeakin unit site.

Marking Rubric

30 MARKS TTL	Poor	Needs Improvement	Satisfactory	Good	Very Good	Excellent
Part A: Data Analysis (Marks: 19) <i>This part relates to the various aspects of data analysis.</i>	0 points Uses irrelevant or inappropriate techniques to analyse the data, or the Data Analysis and visualisation tools were used in an incomplete or inaccurate manner. A very poor presentation of the analysis, or the analysis does not follow accepted analytics principles. 0 – 3.5 Marks	4 points Uses some appropriate data analysis and visualisation tools to analyse the data but there are many errors in the analysis. The presentation of the analysis needs improvement. 4 – 8 Marks	8.5 points Uses appropriate data analysis and visualisations where possible to analyse the data but there are several errors in the analysis. The presentation of the analysis is satisfactory. 8.5 – 11.5 Marks	12 points Uses appropriate data analysis and visualisations where possible to analyse the data but there are some errors in the analysis. The presentation of the analysis is of a respectable standard. 12 - 14 Marks	14.5 points Comprehensive analysis of the data using appropriate techniques, but there are some minor errors in the analysis. Uses data visualisations where appropriate. The analysis is well organised and follows sound analytics principles. 14.5 – 16.5 Marks	18 points Skillful and comprehensive analysis of data using many different techniques. Uses data visualisations where appropriate to produce novel insights. Analysis and written responses are of an exemplary overall standard. 17.0 – 18 Marks
Part B: Memorandum (Marks: 11) <i>This part relates to an ability to succinctly and plainly describe what has been analysed.</i>	0 points Does not communicate any of the main findings of the analysis in an accurate and/or useful way, or the interpretation and communication of findings is at a basic level. The written communication is unprofessional or difficult to follow and contains numerous errors. 0 – 3.5 Marks	4 points Explains some of the main findings of the analysis accurately which only enables the reader to draw a few reasonable conclusions. The written communication is not very easy to follow and/or it contains too many errors. 4 – 5.5 Marks	6 points Explains most of the main findings of the analysis accurately and enables the reader to draw several reasonable conclusions. The written communication is clear and easy to follow but it contains minor errors. 6 – 6.5 Marks	7 points Explains nearly all of the main findings of the analysis accurately and enables the reader to draw mostly reasonable conclusions. The written communication is clear and easy to follow and generally free of errors. 7 – 8 Marks	8.5 points Provides detailed and accurate descriptions of the most important features of the analysis along with appropriately qualified conclusions. The written communication is professional, easy to follow and has a good structure. 8.5 – 9 Marks	12 points Provides the precise conclusions sought. Summary information is presented corresponding sequentially and correctly to each question and assignment instruction. The written communication is very professional, logical and easy to follow. 9.5 – 12 Marks