MIS171 – Business Analytics - Trimester 1 2021
Assignment 2 – Individual

DUE DATE AND TIME:	Due by 8 p.m. AEST on Friday 30 April 2021
PERCENTAGE OF FINAL GRADE:	25%
Submission:	Two-page report (Word file) and data analysis and visualisation (Excel file)

Description:

This is an individual assignment, which focuses on materials presented from Week 1 to (and including) **Week 6 (Hypothesis Testing)**. The scenarios presented in this assessment task simulates a data-driven fact-based solution to a scenario faced by the Deakin Melbourne Boomers. For confidentiality reasons, actual data has not been used in the assessment tasks.

The assignment requires that you analyse a data set, interpret, and draw conclusions from your analysis, and then convey your conclusions in a written report.

You must submit two files:

1. An Excel file, which will include: (a) all your analysis, and (b) an interactive dashboard,

2. A Word file, which will include your report to Christy.

The following introduction to this scenario is followed by detailed guidelines.

Deakin Melbourne Boomers

The Deakin Melbourne Boomers have been a part of the Women's National Basketball League (WNBL) since 1984, making the club both the oldest WNBL club and the longest-running elite-level women's sports team in Australia (in any sport). The iconic brand of the Boomers is both nationally and internationally recognised, most notably for being home to more Olympians and Opals than any other basketball club across Australia.

For 30 years the team was known as the Bulleen Boomers, before transforming into the Melbourne Boomers in 2013. In 2015 Deakin University joined as the club's Naming Rights partner.

The Boomers' Melbourne rivals are the Southside Flyers, which were formed in 2019. The Flyers are based in Dandenong. The Boomers are also based in Melbourne's eastern suburbs. There are no other Melbourne-based WNBL teams.

Currently, the Boomers have almost 7,000 members. There are also more than 3,000 non-members on the Boomers' database, making a distribution list of over 10,000 contacts.

Scenario: The Boomers Campaigns and Promotions

The Boomers use a variety of "Campaigns" to engage with all contacts on their database. All campaigns invite members to renew their membership and non-members to join.

Assume that you are recruited by the Boomers as a business analyst. You have been asked by Ms Christy Collier, the General Manager, to analyse a sample of 250 randomly selected campaigns from the past 10 years alongside new memberships from January 2011 to December 2020.

Christy requires answers to the following questions. Your responses will be used as part of a report to the Managing Board. Christy's questions together with guidelines (shown in blue) are presented below. **For all questions use a 5% Level of Significance (α = 5%).**

1. **Campaign Revenue** is an important measure for the Deakin Melbourne Boomers. Please provide details of the average "Campaign Revenue" in different **"Campaign Types"**.

   - Create suitable tables of summary statistics and at least one graph,

   - calculate 95% confidence interval estimates for the average "Revenue" for each "Campaign Type",

   - in the Conclusion section write a (one sentence) conclusion for each "Campaign Type" (e.g., "I am 95% confident…").

   - in the Conclusion section, in one sentence, answer the question "Which "Campaign Type" generates the highest Revenue?"

   - **Note**: a brief interpretation of your analysis for this question must be included in your report to Christy.

- *In Assignment 1, you created comparative summary measures and relevant graphs regarding Campaign Revenue in different Campaign Types. Compare your analysis with the provided Assignment 1 solution to ensure your analysis is correct.*

2. The Melbourne Boomers aim to have an equal number of **Campaign Types**. Is there any "Campaign Type" that, proportionally, is represented more (or less) than others?

   - Calculate 95% confidence interval estimates for the proportion of campaigns in each "Campaign Type",

   - in the Conclusion section write a (one sentence) conclusion for each "Campaign Type" (e.g., "I am 95% confident…"),

   - in the Conclusion section, in one sentence, answer the question "Is there any "Campaign Type" that, proportionally, is represented more (or less) than the others?

   - **Note**: a brief interpretation of your analysis for this question must be included in your report to Christy.

   - *In Assignment 1, you created tables and graphs regarding different campaign types. Compare your analysis with the provided Assignment 1 solution to ensure your analysis is correct.*

3. Assuming that "**Campaign Success**" is approximately normally distributed, answer the following questions for each individual **"Campaign Type"**. What is the probability that "Campaign Success" is above 75 for each "Campaign Type"?

   - You will need to create suitable comparative summary measures and histograms (with bins = 10, 20, etc) for "Campaign Success" in different "Campaign Types",

   - for each "Campaign Type" calculate the probability of "Campaign Success" being more than 75,

   - in the Conclusion section write a (one sentence) conclusion for each "Campaign Type" (e.g., "The probability that Campaign Success …").

   - **Note**: a brief interpretation of your analysis for this question must be included in your report to Christy.

4. The Melbourne Boomers are considering whether there have been any changes in **new memberships** per month. They suspect that the average "New Membership" per month may

have changed since 2000 when it was 85 new memberships per month. Does the data support this view?

- Conduct an appropriate hypothesis test for "New Membership",

- in the Conclusion section write a (one sentence) conclusion (e.g., "At a 5% level of Significance…").

- **Note**: a brief interpretation of your analysis for this question must be included in your report to Christy.

Data File (Excel)

The provided Excel data file includes 3 spreadsheets including "Data Description", "Campaign", and "Membership".

Data Description

The "Data Description" sheet describes all the variables used in the other two worksheets and copied below for your convenience.

Campaign Sheet:

Campaign **ID**:   Numbered list from Campaign 1 to campaign 250

Campaign **Type:**   Campaigns have been allocated into three broad groups:

- Team-based
- Special Events and Occasions
- Membership Promotions

Campaign **Media:**   Media used in the campaigns:

- Website
- Email
- Facebook
- Other Social Media (e.g., Instagram, Twitter)

Campaign **Reach (NUM):**   Number of contacts (member and non-members) in the specific campaign

Campaign **Reach (CAT):**   Four reach levels are used by the Boomers:

- Targeted: 100 recipients or fewer
- Narrowcast: 101 to 1,000 recipients
- Medium: 1001 to 5,000 recipients
- Broadcast: All contacts (more than 5,000 recipients)

Campaign **Success:**	The Boomers track and score responses from all contacts across all campaigns on a scale of 0 (not at all) to 100 (fully successful)
Campaign **New Members**:	Number of new members signed as an outcome of the campaign.
Campaign **Revenue:**	All campaigns aim to raise revenue for the Boomers. The minimum campaign revenue generated is $0. The most successful campaigns exceed $10,000.

Membership Sheet:

Date:	The month and year the number of new memberships recorded
New Memberships:	Number of new members joining in the specific month-year

Assignment instructions

The assignment consists of three parts.

Part 1: Data Analysis

Your data analysis must be performed on the Assignment 2 Excel file. The file includes tabs for:

- Data Description
- Campaign Sheet
- Membership Sheet
- Analysis for questions 1, 2, 3, and 4
- Interactive dashboard (see below)
- Any additional analysis you want to include in your report or dashboard.

When conducting the analysis, you will apply techniques from descriptive analytics, visualisations, probabilities, hypothesis testing, and confidence interval calculations. Hence, you will use the appropriate tables, graphs, and summary measures. When exploring data, we often produce more results than we eventually use in the final report, but by investigating the data from different angles, we can develop a much better 'feel' for the data - a deeper understanding of the data. This will be valuable when drafting your written report.

The analysis section you submit should be on the Q1 to Q4 worksheets of the Excel file. Where possible, it is always useful to produce both numerical and graphical statistical summaries as sometimes, something is revealed in one that is not obvious in the other. Your analysis should be clearly labelled and grouped around each question. Poorly presented, unorganised analysis or excessive output will be penalised.

Provide a succinct **Conclusion** for each question. Responses in the Conclusion section will be marked.

Use the **Output** section for your analysis. Analysis in the Output section will be marked, please make sure your analysis is complete, clear, and easy to follow. You may need to add rows or columns to present your analysis clearly and completely.

Use the **Workings** section for calculations and workings that support your analysis. The Workings section will not be marked.

Part 2: Report

One of the key performance measures of Ms Christy Collier is **raising revenue for the Deakin Melbourne Boomers**. Having analysed the sample data, including answers to the Data Analysis questions from Part 1 and any further analysis which is appropriate, you are required to provide a report which:

a) Answers all 4 questions described in the Scenario,

b) Makes one recommendation about the "Campaign Type" and "Campaign Media" the Deakin Melbourne Boomers should focus on to achieve the goal of maximising revenue generation. You must explain why you have selected this campaign type. Your recommendation must be supported by an explanation that is based on your analysis of the data.

Highest marks will be awarded to students which consider both "Campaign Type" and "Campaign Media" when drafting their recommendation.

You are allowed no more than 2 pages (approximately 1,000 words) for your report. Remember you should use font size 11 and leave margins of 2.54 cm. A template is provided for your convenience. Carefully consider the following points:

- Your report is to be written as a stand-alone document. Assume that Christy will pass your report directly to her team. Keep the English simple and the explanations succinct. Avoid the use of technical statistical jargon. Your task is to convert your analysis into plain, simple, easy to understand language.
- When composing your reply, make sure that you directly answer the questions asked. Cite (state) the summary statistics of importance without referring to your analysis section.
- Do not copy the Assignment Instructions when drafting your report.

- Include a succinct introduction at the start of your report.
- Marks will be deducted for the inclusion of irrelevant material, poor presentation, poor organisation, poor formatting, and reports that exceed two pages.

When you have completed drafting your report, it is a useful exercise to leave it for a day, and then return to it and re-read it as if you knew nothing about the analysis. Does it flow easily? Does it make sense? Can someone without prior knowledge follow your written conclusions? Often when re-reading, you become aware that you can edit the report to make it more direct and clearer.

Part 3: Interactive Dashboard

Include an interactive "dashboard" for Christy which will help her understand and visualise key data and allow her to drill down into the data.

Your interactive dashboard must be completed on the "Dashboard" tab of the Excel file.

The minimum requirement is a neat, functional, interactive dashboard. It is expected that the dashboard includes at least four (4) and up to six (6) interactive components.

The following questions will help guide you in designing an interactive dashboard.

1. What are the highest priority areas that should be included in the Dashboard?

2. What are the most appropriate visualisations for the dashboard?

3. What about colour choices?

4. How can I make the dashboard interactive?

Learning Outcomes

This task allows you to demonstrate achievement towards the unit learning outcomes (ULOs). The ULOs are aligned with specific graduate learning outcomes – that is, the skills and knowledge graduates are expected to have upon completion of their studies – and this assessment task is an important tool in determining the achievement of those outcomes. If you do not demonstrate the achievement of the unit learning outcomes, you will not be successful in this unit.

It is good practice to familiarise yourself with the ULOs and GLOs as they provide guidance on the knowledge, understanding and skills you are expected to demonstrate upon completion of the unit. In this way, they can be used to guide your study.

Unit Learning Outcomes (ULO)	Graduate Learning Outcomes (GLO)
ULO1: Apply quantitative reasoning skills to analyse business problems.	**GLO1:** Discipline-specific knowledge and capabilities: appropriate to the level of study related to a discipline or profession
ULO2: Create data-driven/fact-based solutions to complex business scenarios.	**GLO5:** Problem-solving: creating solutions to authentic (real world and ill-defined) problems
ULO3: Implement contemporary data analysis tools to analyse business performance.	**GLO3:** Digital literacy: using technologies to find, use and disseminate information
ULO4: Interpret findings and effectively communicate solutions to business scenarios.	**GLO2:** Communication: using oral, written and interpersonal communication to inform, motivate and effect change.

Submission Instructions

Your submission will comprise of two files:

1. A Microsoft Word document containing Part 2: your report to Christy, and

2. A Microsoft Excel workbook file containing:

    a. Your Analysis, on the relevant tabs, and

    b. Your Dashboard.

Your submission files should be named:

Word file: MIS171_T1_YOURStudentID.doc (or .docx), and

Excel file: MIS171_T1_YOURStudentID.xls (or .xlsx).

Enter YOUR student ID in the appropriate place when naming your submission files. This assessment is to be submitted ONLINE ONLY into the Assessment 2 Dropbox available on the MIS171 Cloud Deakin site.

All work you submit is checked electronically or by other means for the purposes of detecting collusion and/or plagiarism.

When you are required to submit an assignment through your CloudDeakin unit site, you will receive an email to your Deakin email address confirming that it has been submitted. You should check that you can see your assignment in the Submissions view of the Assignment Dropbox folder after upload, and check for, and keep, the email receipt for the submission.

Marking and feedback

The marking rubric for this task is available in the MIS171 CloudDeakin unit site - in the Assessment folder (under Assessment Resources).

It is always a useful exercise to familiarise yourself with the criteria before completing any assessment task. Criteria act as a boundary around the task and help identify what assessors are looking for specifically in your submission. The criteria are drawn from the unit's learning outcomes ensuring they align with appropriate graduate attribute/s.

Identifying the standard, you aim to achieve is also a useful strategy for success and to that end, familiarizing yourself with the descriptor for that standard is highly recommended.

Students who submit their work by the due date will receive their marks and feedback on CloudDeakin 15 working days after the submission date. In order to understand areas where improvement is required, students are encouraged to refer to the suggested solutions, comparing their answers with the 'model' answers provided, which will be released after the test closes for all students.

Extensions

Extensions will only be granted for exceptional and/or unavoidable circumstances outside the student's control.

Students seeking an extension for an assignment before the due date should apply directly to the Unit Chair (Dr Reza Kachouie: MIS171@deakin.edu.au) by completing the Assignment and Online Test Extension Application Form. Requests for extensions will not be considered after 12 pm (noon), Friday 30 April 2021. When requesting an extension, you need to provide evidence to support your request and **a draft of the work that you have completed on the assessment to date.** You must be able to demonstrate exceptional circumstances. Applications for special consideration after this time must be submitted via StudentConnect.

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 up to five days, and work that is submitted more than five days after the due date will not be marked and will receive 0% for the task. 'Day' means working day for paper submissions and 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.

Calculation of the late penalty is as follows:

- 1 day late: submitted after Friday 11:59 pm and before Saturday 11:59 pm– 5% penalty.
- 2 days late: submitted after Saturday 11:59 pm and before Sunday 11:59 pm – 10% penalty.
- 3 days late: submitted after Sunday 11:59 pm and before Monday 11:59 pm – 15% penalty.
- 4 days late: submitted after Monday 11:59 pm and before Tuesday 11:59 pm – 20% penalty.
- 5 days late: submitted after Tuesday 11:59 pm and before Wednesday 11:59 pm – 25% penalty.

Dropbox closes after 11:59 pm AEST on 5 May 2021.

Support

The Division of Student Life (see link below) provides all students with editing assistance. Students who wish to take advantage of this service must be organized and plan ahead and contact the Division of Student Life in order to schedule a booking, well in advance of the due date of this assignment.
http://www.deakin.edu.au/about-deakin/administrative-divisions/student-life

Referencing

Any material used in this assignment that is not your original work must be acknowledged as such and appropriately referenced. You can find information about plagiarism and other study support resources at the following website: http://www.deakin.edu.au/students/study-support

Academic misconduct

For 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 in the Resources area of the CloudDeakin unit site.

Good luck everyone.

The Unit Team