

This document provides you with information about the requirements for assessment. Detailed instructions and resources are included to help you to complete and submit the task. The Criterion Reference Assessment (CRA) Rubric that markers use to grade the assessment task is included and should be used as a guide when working on the assessment task.

Assessment Overview

Assessment name:	Problem Solving Task
Description:	<p>As part of this assignment, you will be required to:</p> <ol style="list-style-type: none"> 1) Analyse a nutrition dataset and answer a series of knowledge-based questions; and 2) Use the same nutrition dataset to follow the scientific method and write a report on your process of developing a research question and hypothesis, testing your hypothesis, as well as presenting and discussing the importance/relevance of your findings. <p>The dataset to be used for this assignment task is available in the Assessment 3 folder of the Blackboard site. The data is from a cross-sectional study of Australian adults. A separate document describing all variables in the dataset is available in the Assessment 3 folder.</p>
Due Date:	Sunday 6 th June, 11:59pm

Length:	<p><u>Part A:</u> no specific word limit, but make sure to just present the answers to the specific analytical tasks.</p> <p><u>Part B:</u> 2,000 words maximum (strict limit)</p> <p>Note: the word count includes in-text referencing and excludes tables, figures, and the references list. Please do not use Appendices.</p>
Weighting to overall:	55%
Individual or Group:	Individual

How will I be assessed:	<p>Part A is worth 20% (of the 55% for this assignment). You will be allocated marks out of 50 for correct responses. Your score will be converted to a percentage.</p> <p>Part B is worth 35% (of the 55% for this assignment). Refer to Qualitative rubric (7 – 1) (<i>below</i>) for the criteria used to assess Part B.</p>
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	Your overall percentage and grade for this assignment will be determined by adding together your percentages obtained in Part A and B and applying the corresponding weighting for each part.
Learning outcomes measured:	<ol style="list-style-type: none"> 1. Apply the fundamental principles of nutritional epidemiology in an ethical and culturally competent manner, including study design, diet and nutrition data collection methods, and assessment of nutritional status in population groups. 2. Describe strengths and limitations of nutrition-related data collections, including bias, confounding, and generalisability of research findings. 3. Analyse data using appropriate statistical methods and report the findings for communication to others.
Moderation:	This assessment item will be moderated before marks are released.

Assessment Details

<p>What you need to do:</p>	<p>To complete this assignment, you need to undertake the following tasks:</p> <p>Part A: Analysis of a nutrition dataset (20% - marked out of 50)</p> <ul style="list-style-type: none"> Use Jamovi software to analyse the nutrition dataset provided and respond to a series of (knowledge-based) activities and questions which are designed to assess your knowledge and application of statistical principles we have learnt during semester. The tasks completed in the statistics workshops in Weeks 5-7 will be of particular help in addressing these questions. It is expected that you will provide screenshots of computed variables, transformed variables, descriptive statistics, tables, graphs and output from statistical analysis in Jamovi where it is appropriate to do so. Descriptive statistics (6 marks) <ul style="list-style-type: none"> Calculate BMI for each of the participants and create this as a continuous BMI variable. Briefly describe your process for creating this BMI variable. Then use suitable statistical indicators and a graph to summarise the distribution of this variable. Transform BMI into a categorical variable (based on the WHO categories for underweight, normal weight, overweight and obese). Briefly describe your process for transforming this variable. Include a graph that summarizes the new categorical BMI variable. Create a table to summarize the frequency distribution for the categorical BMI variable. Please report on the proportion (%) of individuals in each category of BMI. Looking at your newly created continuous BMI variable, do you think this variable has a Normal distribution? Please explain your answer. Describe the process you used to determine this. What graph would you use to visually represent the relationship between the continuous BMI and daily energy intake (kjoules_day) variables? Create this graph and briefly interpret it. Create a box-and-whisker plot to visually represent the relationship between BMI as a continuous variable and sex. Briefly interpret the graph. Correlation (10 marks) <ul style="list-style-type: none"> In general, what does it mean if two variables are positively correlated? What does it mean if they are negatively correlated? Pick 4 continuous variables from the dataset and review the correlation matrix. Are there any pairs of
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variables that are significantly correlated and if so, which ones? Which null-hypothesis and alternative hypothesis are being tested? Please describe the process you used to determine which variables are correlated, including a justification for your choice of a suitable type of correlation coefficient.

▪ **T-test (10 marks)**

- What is the purpose of a t-test? What types of variables are used in a t-test?
- Run the most appropriate t-test to see if there is a significant difference in height between men and women. What is the null hypothesis? What is the alternative hypothesis for this test? Please describe the steps involved in comparing the groups, including your evaluation of suitability of the t-test (whether statistical assumptions were met).

▪ **Linear Regression (12 marks)**

- Choose 2 continuous variables from the dataset and carry out a linear regression analysis. Which variable is your dependent variable and which variable is your independent variable?
- What is the p-value (level of significance) and r-squared value for this linear regression analysis? How do you interpret these? (P-value and r-squared)
- Please interpret the beta-coefficient/s in the linear regression model.

▪ **Adjusted Linear Regression (12 marks)**

- Building on the above linear regression analysis, choose another variable from the dataset that you would like to investigate because of its potential to be a confounding variable of the association you assessed. Briefly explain why you think this variable may be a confounder with respect to the variables you selected for the linear regression.
- Carry out a multiple linear regression by including your potential confounding variable. Based on your analysis, do you think your additional variable is indeed a confounding variable? Why or why not? What process did you use to determine this?

Part B: Scientific report that addresses your own research question (35%)

- For this part of the assignment you will follow the scientific method to develop and answer your own research question using the dataset provided. You will then prepare a written report as a means of presenting your findings.
- In following the scientific method you will:
 1. Develop an answerable research question (based on the variables available in the dataset)
 2. Develop a hypothesis (null and alternative hypothesis)
 3. Identify and undertake appropriate statistical analyses to test your hypothesis and answer your research question. **It is expected that you will do a minimum of three statistical tests for this part of the assignment.**
 4. Present, interpret and provide critical discussion of your results using references from peer-reviewed research papers.

Example research questions: Please refer to a separate document in the Assessment 3 folder that lists a number of example research questions that could be addressed for Part B of this assignment.

Points to be aware of:

-If you assess correlations or test differences between groups by using a t-test or ANOVA, discuss whether the assumptions for these tests are met. If the assumptions are not met, you will be expected to carry out the equivalent non-parametric tests instead.

-If you carry out linear regression analysis, make sure that your dependent and independent variables are both continuous variables. A covariate in the model that you evaluate as potential confounder, can be a categorical variable.

Layout of the report for Part B

- Your report should consist of the following sections:
 1. **Introduction (importance of the topic and Research Question/Hypothesis)**
 - Based on the potential relationships you have chosen to investigate, briefly provide a rationale as to why these associations may be of interest (use scientific literature to support your argument).
 - State your main research questions in PICO (or other suitable format).
 - State your null and alternate hypotheses (for each of the tests you are going to undertake).

	<p>(Note: Your research questions, hypotheses and statistical tests should be based directly on the variables available in the dataset or variables that you choose to compute/generate or transform from these variables.)</p> <p>2. Methodology (Statistical analysis)</p> <ul style="list-style-type: none"> Describe the variables that you will use to test your hypothesis (ie. Which are dependent and independent variables? What type of variables are they? Why have you chosen these variables?) What statistical test/s will you use to test your hypotheses? Please describe what test/s and why? <p>3. Results (Findings from your analysis)</p> <ul style="list-style-type: none"> Present appropriate graphical representations of your results (ie. Descriptive/summary statistics and graphs). Present appropriate output from statistical tests that you have undertaken to generate your results. Describe and interpret your results in detail. <p>4. Critical Discussion (of your results in the context of available literature) and Conclusion</p> <ul style="list-style-type: none"> Discuss what your results mean. (Do the results support or refute your hypotheses? Was this expected or unexpected? Why might this be the case?) Discuss your findings in the context of available literature. (What does the published research say regarding your research question/hypotheses?) Consider discussing potential confounding variables (even when you did not formally test confounding in your analyses) State your final conclusion. <p>Formatting requirements:</p> <ul style="list-style-type: none"> Please use Times New Roman in size 11 font; margins at 2cm; and 1.5 line spacing. Please include a title page with your name and student number, and the general topic and word count of your report for Part B. Please write this piece of assessment like a formal essay/report. Do not use Appendices.
What you need to submit:	<p>This assignment task requires you to submit the following items:</p> <ol style="list-style-type: none"> One Adobe PDF or Microsoft Word file that contains (1) <u>Part A</u>: your responses to the questions in Part A, (2) <u>Part B</u>: your report written for

	<p>part B, (3) <u>reference list</u>: a short reference list correctly formatted in APA format.</p> <p>Note: please do not include appendices.</p>
How to submit:	<p>This assessment task must be submitted in electronic format via Turnitin within QUT Blackboard.</p> <p>Disclaimer: <i>On submission you are declaring that, unless otherwise acknowledged, this submission is wholly yours and/or the group's own work. You understand that this work may be submitted for plagiarism check and consent to this taking place.</i></p>

Academic Integrity

As a student of the QUT academic community, you are asked to work to uphold the principles of academic integrity during your course of study. QUT sets expectations and responsibilities of students, more specifically it states that students are expected to adopt “an ethical approach to academic work and assessment in accordance with this policy and the Student Code of Conduct. E/2.1” (QUT Manual of Policies and Procedures C/5.3.3 Academic Integrity, Roles and responsibilities).

Students are expected to demonstrate their own understanding and thinking using the ideas provided by ‘others’ to support and inform their work, always making due acknowledgement to the source. While we encourage peer learning, it is not appropriate to share assignments with other students unless your assessment piece has been stated as being a group assignment. If you do share your assignment with another student, and they copy part of or all of your assignment for their submission, this is considered collusion and you may also be reported for academic misconduct. If you are unsure and need further information you can find this at http://www.mopp.qut.edu.au/C/C_05_03.jsp#C_05_03.03.mdoc.

Criteria	7	6	5	4	3	2	1
Introduction Weighting: 20%	Exceptionally well researched and justified background information on the chosen topic, leading to a highly specific and answerable research question and a clear, testable hypothesis.	Very well researched and justified background information on the chosen topic, leading to a highly specific and answerable research question and a clear, testable hypothesis.	Background information on the topic is well researched and justified ; a good research question and hypothesis are presented, but may not be entirely specific, measurable or testable.	Background information on the chosen topic is somewhat researched and justified ; a sound research question and hypothesis are presented, but may not be entirely specific, measurable or testable.	Background information on the topic is limited, lacks relevance and clarity and contains many flaws and the research question is not specific or answerable; and the hypothesis is not testable.	Background information on the topic is very limited, lacks relevance and clarity and contains many flaws and misunderstandings ; the research question is not specific or answerable; and the hypothesis is not testable.	No Evidence
Methodology Weighting: 20%	Choice of descriptive statistics, graphs and statistical tests to answer the research question are highly appropriate and exceptionally well justified .	Choice of descriptive statistics, graphs and statistical tests to answer the research question are highly appropriate and very well justified .	Choice of descriptive statistics, graphs and statistical tests to answer the research question are mostly appropriate and fairly well justified, but may contain some inaccuracies and lack depth in parts .	Choice of some descriptive statistics, graphs and/or statistical tests to answer the research question are appropriate, however not all are justified and there are inaccuracies and lack of depth.	Choice of descriptive statistics, graphs and/or statistical tests are not appropriate and demonstrate limited understanding of statistical data analysis	Choice of descriptive statistics, graphs and statistical tests are not appropriate and demonstrate little to no understanding of statistical data analysis	No Evidence
Results Weighting: 20%	All relevant results are presented and interpreted with a very high level of accuracy .	All relevant results are presented and interpreted with a high level of accuracy .	Most relevant results are presented and interpreted, but may contain some inaccuracies and lack depth in parts .	Some results are presented and interpreted but with flaws and misunderstandings .	Limited results are presented and interpreted, which contain many flaws and misunderstandings .	Little to no results are presented and interpreted.	No Evidence
Discussion Weighting: 20%	A very insightful and highly critical discussion of results with highly appropriate and relevant links and comparisons made to existing literature on the topic.	An insightful and very good critical discussion of results with highly appropriate and relevant links and comparisons made to existing literature on the topic.	A good critical discussion of results with mostly appropriate and relevant links and comparisons made to existing literature on the topic, but may contain some inaccuracies and lack depth in parts.	Some critical discussion of results, but links and comparisons to existing literature on the topic contain inaccuracies and lacks depth.	Limited critical discussion of results in the context of existing literature on the topic, which contains many inaccuracies.	Little to no critical discussion of the results in the context of existing literature on the topic.	No Evidence

Criteria	7	6	5	4	3	2	1
<p>Written communication and quality of literature</p> <p>Weighting: 20%</p> <ul style="list-style-type: none"> – fluent & persuasive with a logical flow of ideas – adheres to assignment specifications including word limit – key terminology is evident & used in correct context – technically correct citations in text & reference list using a consistent style of referencing 	<p>Sourced literature referenced in report is of extremely high quality.</p> <p>Assessment is exceptionally well written, highly coherent and professionally presented in terms of style, format & English conventions.</p>	<p>Sourced literature referenced in report is of very high quality.</p> <p>Assignment is very well written, very coherent and professionally presented in terms of style, format, assignment specifications & English conventions.</p>	<p>Sourced literature referenced in report is of high quality.</p> <p>Assignment is well written, mostly coherent and well presented in terms of style, format, assignment specifications & English conventions, but may contain some errors</p>	<p>Sourced literature referenced in report is of acceptable quality.</p> <p>Assignment is written to an acceptable level, but is not coherent in parts and presentation in terms of style, format, assignment specifications & English conventions contains errors.</p>	<p>Sourced literature referenced in report is of poor quality.</p> <p>Assessment is poorly written, very incoherent and poorly presented in terms of style, format, assignment specifications & English conventions, which contain many errors.</p>	<p>Sourced literature referenced in report is of very poor quality.</p> <p>Assignment is very poorly written, very incoherent and very poorly presented in terms of style, format, assignment specifications & English conventions.</p>	<p>No Evidence</p>

This rubric and grading scale is in accordance with the QUT Manual of Policies and Procedures (MOPP C/5.2.3 QUT Grading scale).