	ASSIGNMENT	**DUE DATE:** 06/06/2025
UNIVERSITI MALAYSIA PAHANG AL-SULTAN ABDULLAH		**TOTAL MARK:** 60 Marks (10%)

This assignment is aimed to help you understand the statistical analysis process using software such as *Microsoft Excel* and to foster your integrity in reporting your assignment. The best way to understand statistics is by involving yourself in the whole statistical process and not just limited to studying statistics from books, videos, or the internet. This assignment requires you to follow the steps of statistical problem-solving methodology by conducting your own study. You will experience how to collect, organise, summarise, analyse, present, interpret, and draw conclusions from data, as well as prepare a report of your study.

INSTRUCTIONS:

1. Form a group of **four (4)** or **five (5)** members from your section only and name your group using any **statistical term.**

2. Obtain an **APPROVAL** of your chosen topic from your lecturer **BEFORE** you start data collection and begin your statistical analysis. Use the assessment plan template on **page 4**.

3. Data for this assignment can be primary data or secondary data (e.g. internet/ report) and it is **quantitative data**. If primary data collected is obtained using Google form or others, ensure that the questions in the form are less than 5 questions.

4. Answer **ALL** questions and use **appropriate statistical notations**. These questions will guide you to prepare a comprehensive and good report. It will demonstrate your understanding of this course. The format and report guidelines are given on **page 5**.

5. Perform **ALL** analysis using *Microsoft Excel* and the *P*-value approach.

6. **Submit** the following items for **EACH group:**
   (i) **A softcopy report (pdf file)** that includes all attachments of any relevant evidence (*Microsoft Excel* outputs, handwritten data record, photos, Google Docs, etc.) in the appendix section.
   (ii) **A softcopy** of the Excel worksheet that you worked on to complete the report.
   (iii) Attach the assignment approval in the appendix.
   (iv) **Submit via KALAM**, name your file as (Section)_(group name), for example, 01G_MEAN.

7. Progress of assignments will be checked regularly to avoid last-minute attempts.

8. Cheating and plagiarism are prohibited and penalties will be imposed.

9. Use the template on **page 6** as the cover for your assignment. Fill in all the required particulars clearly.

10. The assignment will be graded based on the given rubrics on **pages 7 and 8**.

11. LATE submission of the assignment will not be entertained, and it will not be graded.

Instruction:

Answer the following questions to help and guide you in understanding the statistical analysis methodology and prepare a good report that fulfils the requirements of the assignment.

1. **Identify** a topic/ problem that you are interested in studying. Provide a brief **description** of your study and state at least **ONE (1)** study objective.

    (2 Marks)

2. State the **population** of the study.

    (1 Mark)

3. Determine a **single quantitative variable** that is related to your chosen problem. Identify the **type of level of measurement** for the variable.

    (2 Marks)

4. Divide the data collected into **two significant groups** (e.g.: gender (male/female), faculty, year of study, etc.) that are related to the study. The sample size is **at least 50 observations** for **each group**.

    (i)   State the **name of the groups**. (1 Mark)
    (ii) Present the data collected according to the groups in a table.

Group 1	Group 2
(list of data)	*(list of data)*

    (2 Marks)

    (iii) Identify the **method of data collection** being used. Provide significant **evidence**.

    (2 Marks)

    (iv) State the **sampling method** you use to collect the data. **Explain** the sampling method process.

    (2 Marks)

5. For each set of data, obtain the **descriptive statistics** using *Microsoft Excel*. Then, summarise the **measures of central tendency (mean, median, mode, midrange)** and **measures of variation (range, standard deviation, variance)** in the following table.

Group Name	Measures of central tendency	Measures of variation
Group 1		
Group 2		

    (3 Marks)

6. **Compare** and **comment** on the measures of central tendency and measures of variation between **Group 1** and **Group 2**.

    (4 Marks)

7. Construct **box plots** for the **two** sets of data on the **same axis**. Identify the **shape of the distribution** for each boxplot. **Compare** and **comment** on the **average** and **variability** of the boxplots.

    (8 Marks)

8. What is the **best measure of central tendency** to describe your data? Give a **reason**.

(2 Marks)

9. What is the **best measure of variation** to describe your data? Give a **reason**.

(2 Marks)

10. Construct a **normal probability plot** for each data set. Do the data appear to come from an approximately normal distribution?

(4 Marks)

11. In Chapter 3, you have learnt statistical hypothesis testing concerning a parameter(s) of one and two populations. Hypothesis testing is one of the inferential statistics in statistical analysis. The parameters are the population mean, proportion, variance and standard deviation. Assuming that the data obtained in **(4)** is a normally distributed population, answer the following questions using the *P*-value approach and *Microsoft Excel*.

(**NOTE**: Create your own hypothesised mean with justification, may use the overall mean of the data)

a. Create a situation and conduct **hypothesis testing for one population mean** from one of the groups.

(8 Marks)

b. Choose one probability sampling method to select less than 30 data from each group.
   i. Identify which sampling method you choose to select the data and explain the sampling method process.

(2 Marks)

   ii. Present the selected data in a table.

Group 1	Group 2
(list of data)	*(list of data)*

(2 Marks)

c. Create a situation to conduct a **hypothesis testing** using the data selected in **(b)** to **compare two population means** between the groups**.**

(12 Marks)

12. Based on your problem/topic stated in (1), give any relevant **conclusion** for the study.

(1 Mark)

ASSIGNMENT REPORT FORMAT AND GUIDELINES

Section: _____ **Group Name**: _____ **PIC**: _____

SECTION	EXPLANATION	PROGRESS STATUS
COVER PAGE	Use the cover page provided and fill in the information	Week 2-4 Approval of topic
CONTENT	List of content and pages	
1. INTRODUCTION Q1	Describe what and why you choose the topic to study. State the objective of your study.	
2. DATA DESCRIPTION (Chapter 1) Q2 – Q3	State the population involved and the quantitative variable you choose to study. Example: Population -Students of UMP Gambang, UMP staff etc. and height is the quantitative variable. Note: Data collected from each population should be **at least 50 observations.** Describe the collected data in terms of type and level of measurement.	
3. DATA COLLECTION METHOD (Chapter 1) Q4	Describe the data collection method/ process and state the sampling method used. Note: Include the list of data in a table.	
4. DATA SUMMARY (Chapter 1) Q5 – Q9	(i) Numerical Summary - Descriptive statistics - Include a summary table of measures of central tendency and measures of variation - Compare and comment on measures of central tendency and measures of variation (ii) Graphical summary - Box plot - Compare and comment on average and variability **Note:** Include the *Microsoft Excel* output.	Week 5-9
5. DATA NORMALITY (Chapter 1) Q10	Present a normal probability plot for each population and comment on the normality properties. **Note:** Include the *Microsoft Excel* output.	
6. HYPOTHESIS TESTING FOR ONE POPULATION MEAN (Chapter 3) Q11(a)	Create a situation to demonstrate hypothesis testing for one population. Describe the hypothesis testing analysis conducted on one population (testing mean for one of the groups) and **Note:** Include the *Microsoft Excel* output.	Week 10-11
7. HYPOTHESIS TESTING FOR TWO POPULATION MEANS (Chapter 3) Q11 (b,c)	Create a situation to demonstrate hypothesis testing for two populations. Describe the data selection process and present the data in a table. Describe the hypothesis testing analysis conducted on two population means (testing mean from both groups). **Note:** Include the *Microsoft Excel* output.	
8. CONCLUSION	Summarise and conclude the findings from the study.	Week 12 Submission
APPENDIX	List and include all the evidence such as Google form, data and other related documents. Also, attach the assignment plan and approval form.	

BUM2413 APPLIED STATISTICS
ASSIGNMENT MARKING SCHEME RUBRICS

Section: _____**Group Name**: _____

NO.	ELEMENTS	MARKS		MARKS GIVEN	
1	Identify a problem	**1**	**2**		
	Description of your study	**1**			
2	State population	**1**	**1**		
3	Determine a single variable	**1**	**2**		
	Level of measurement of the variable	**1**			
4	(i) State the name of the groups	**1**	**7**		
	(ii) Data collected for 2 groups	**2**			
	(iii) Identify the method of data collection	**1**			
	Evidence	**1**			
	(iv) Identify the sampling method	**1**			
	Explain the sampling method process	**1**			
5	Descriptive statistics (from *Microsoft Excel*) for each set of data	**1**	**3**		
	Summary of measures of central tendency and measures of variation in a table.	**2**			
6	Compare and comment on measures of central tendency	**2**	**4**		
	Compare and comment on measures of variation	**2**			
	Use the wrong correct notation	**-1**			
7	Box plots for all data sets on the same *x*-axis	**2**	**8**		
	The shape of the distribution for each boxplot	**2**			
	Compare and comment on the averages	**2**			
	Compare and comment on the variability	**2**			
8	Best measure of central tendency	**1**	**2**		
	Reason	**1**			
9	Best measures of variation	**1**	**2**		
	Reason	**1**			
10	Normal Probability Plot	**2**	**4**		
	Comments for each plot	**2**			
11 (a)	**One Population**				
11 (a)	Create a situation	**1**	**8**		
	Hypothesis statement	**1**			
	Test Statistics	**2**			
	P-value	**1**			
	Decision	**2**			
	Conclusion	**1**			

NO.	ELEMENTS	MARKS		MARKS GIVEN	
11 (b)	**Two Populations**				
11 (b)(i)	Identify sampling method	1	**2**		
	Explain the sampling method	1			
11 (b)(ii)	Present the data	2	**2**		
11 (c)	Create a situation	1	**12**		
	Hypothesis for variance equality	1			
	The P-value for variance equality	1			
	The decision for variance equality	2			
	Conclusion for variance equality	1			
	Hypothesis for two population means	1			
	Microsoft Excel Output for two population means	1			
	P-value	1			
	Decision	2			
	Conclusion	1			
12	Conclusion of the study	1	**1**		
	TOTAL	**60**			