SCHOOL OF MATHEMATICAL SCIENCES

B SC (HONS) IN INDUSTRIAL STATISTICS
B SC (HONS) IN ACTUARIAL STUDIES

ACADEMIC SESSION: APRIL 2024 SEMESTER

MST3024 MULTIVARIATE ANALYSIS

ASSIGNMENT

DUE DATE: 29 JULY 2024

INSTRUCTIONS TO CANDIDATES

1. There are **FIVE (5)** pages in this coursework excluding the cover page.

2. This is a **Group Assignment,** and will contribute **40%** to your final grade.

3. This group assignment should be carried out by student groups, which consist of FOUR (4) – FIVE (5) members.

4. All group members must be present for **Group Project Consultation** with the instructor during weeks 12 - 13.

5. A written report must be submitted by each group through *eLearn* by **12 noon**, **29 July 2024**.

DETAILS OF ASSIGNMENT

This assignment entails conducting an in-depth exploration of the World Values Survey (WVS) datasets to uncover latent patterns and relationships using exploratory, unsupervised learning or classification techniques covered in this course.

Students will analyze TWO (2) countries in the WVS dataset, create diverse visualizations to delve into the data and interpret findings through multivariate statistical methods. The focus will be on providing a contrast between two selected countries, facilitating a deeper understanding of potential similarities and differences.

The report should be organised according to these parts:

- Executive Summary
  - Mini summary or overview of the report. It should include key findings from data exploration and analysis using multivariate techniques.
- Introduction
  - This section should be brief. Generally, the background of the topic and data.
- Data Exploration & Analysis
  - This section describes the data using graphs, summary statistics, or bivariate techniques. This is then followed by multivariate techniques (e.g. principal component analysis, cluster analysis, multidimensional scaling, exploratory factor analysis, or discriminant analysis).
- Conclusion
  - This section should include a summary of the main findings and insights of the study.
- Appendices
  - R code, references, raw data tables etc…

Further instructions:

1. The report must be written using Times New Roman of 12-point font size, with 1.15 line spacing. Font size of tables and figures can be 8-point. Leave 2.5 cm for the Top, Bottom, Left and Right margins.

2. The 'Executive Summary' should <u>Not</u> exceed 2 pages.

3. The other sections (from 'Introduction' to 'Conclusion', excluding 'Executive Summary' and 'Appendices') should <u>Not</u> exceed 15 pages in length.

4. Marks will be based on the depth of analysis conducted using the R programming language, the accurate and innovative application of multivariate techniques, and the clarity of communication and interpretation of results.

DATASET
World Values Survey Wave 7 (2017-2020):
Malaysia, Australia, Japan, Singapore, South Korea.

The World Values Survey (WVS) is an international research program devoted to the scientific and academic study of people's social, political, economic, religious and cultural values. The project aims to assess the impact of values stability or change over time on the social, political and economic development of countries and societies.

The most recent 7th wave of the World Values Survey started in mid-2017 and following a 1-year postponement due to the COVID-19 pandemic, was finally closed on December 31, 2021. [Sustainable Development Goal 11: Sustainable Cities and Communities]
Source: https://www.worldvaluessurvey.org/wvs.jsp

Variables	Description
For Q1 – Q6: Important in life. *(1=Very important; 2=Rather important; 3=Not very important; 4=Not at all important)*	
Q1	Family.
Q2	Friends.
Q3	Leisure time.
Q4	Politics.
Q5	Work.
Q6	Religion.
Q46	The feeling of happiness. *(1=Very happy; 2=Rather happy; 3=Not very happy; 4=Not at all happy)*
Q47	Self-rated health. *(1=Very good; 2=Good; 3=Fair; 4=Poor; 5=Very poor)*
Q48	Freedom of choice and control in your life. *(Scale of 1 to 10, where 1= No choice at all --- --- --- 10: A great deal of choice)*
Q49	Satisfaction with life. *(Scale of 1 to 10, where 1= Completely dissatisfied --- --- --- 10: Completely satisfied)*
Q50	Satisfaction with the financial situation of your household. *(Scale of 1 to 10, where 1= Completely dissatisfied --- --- --- 10: Completely satisfied)*
Q112	Perceptions of corruption in the country. *(Scale of 1 to 10, where 1= No corruption --- --- --- 10: Abundant corruption)*
Q164	Importance of God in life. *(Scale of 1 to 10, where (1=Not at all important --- --- --- 10: Very important)*

Q165	Belief in God. *(1=Yes; 2=No)*
Q166	Belief in life after death. *(1=Yes; 2=No)*

For Q224 – Q233: Perception of how often the following occurs in the country's elections.
(1=Very often; 2=Fairly often; 3=Not often; 4=Not at all often)

Q224	Votes are counted fairly.
Q225	Opposition candidates are prevented from running.
Q226	TV news favours the governing party.
Q227	Voters are bribed.
Q228	Journalists provide fair coverage of elections.
Q229	Election officials are fair.
Q230	Rich people buy elections.
Q231	Voters are threatened with violence at the polls.
Q232	Voters are offered a genuine choice in the elections.
Q233	Women have equal opportunities to run the office.

Q250	How important is it for you to live in a country that is governed democratically? *(Scale of 1 to 10, where 1= not at all important --- --- --- 10: absolutely important)*
Q251	How democratically is this country being governed today? *(Scale of 1 to 10, where 1= not at all democratic --- --- --- 10: completely democratic)*
Q252	How satisfied are you with how the political system is functioning in your country these days? *(Scale of 1 to 10, where 1= not satisfied at all --- --- --- 10: completely satisfied)*
Q253	How much respect is there for individual human rights nowadays in this country? *(1=A great deal of respect; 2=Fairly much respect; 3=Not much respect; 4=No respect at all)*
Q254	How proud are you to be (country's nationality)? *(1=Very proud; 2=Quite proud; 3=Not very proud; 4=Not at all proud; 5=I am not [country's nationality])*

For Q255 – Q259: How close do you feel to …?
(1=Very close; 2=Close; 3=Not very close; 4=Not close all often)

Q255	Your [village, town or city].
Q256	Your [county, region, district].
Q257	Country.
Q258	Continent.
Q259	World.

Demographics	
Gender	Gender. *(1=Male; 2=Female)*
Age	Age. *(numeric)*
Marital	Marital status. *(1=Married; 2=Living together as married; 3=Divorced; 4=Separated; 5=Widowed; 6=Single)*
Employment	Employment status. *(1= Full time; 2=Part-time; 3=Self-employed; 4=Retired/pensioned; 5=Homemaker; 6=Student; 7=Unemployed; 8=Other)*
Class	Self-perception of social class. *(1=Upper class; 2=Upper middle class; 3=Lower middle class; 4=Working class; 5=Lower class)*
Urban_Rural	Settlement type. *(1=Urban; 2= Rural)*

ASSESSMENT RUBRICS (BRIEF)

Section		**Marks**
Executive Summary	• Concise, clear mini summary of key findings.	3
Introduction	• Good introduction of the topic and data.	3
Data Exploration & Analysis	• Good visualizations and labelling of charts.	3
	• Good interpretation of results.	9
Conclusion	• Deep insights into findings.	3
	• Good summary.	3
Overall	• Novelty in findings.	3
	• Well written, with proper referencing.	3
Total		**30**

The total marks of 30 will be adjusted to 40.

--END OF PAPER--