THE UNIVERSITY OF AUCKLAND
BUSINESS SCHOOL

INFOSYS 750, Test 1

(Total Time Allowed: **2** hours, including reading time)

	Marks
Question 1:	15
Question 2:	15
Quiz-Test 1	10
Total marks for the test	40

Instructions:

1. This test counts for 25% of your overall grade.
2. The test contains 2 data analysis questions and a quiz (that is available on Canvas); attempt ALL questions. The test is marked out of 40.
3. Total time allowed is 2 hours.
4. This is an open book/notes (lecture and lab notes on Canvas) test.
5. You may use a calculator if you need.
6. You can start as soon as test is available on Canvas.

Before you start:

1. Your submission (on canvas) should be in the form of a report that responds to the parts of this test. **Please name of extra packages that you have used and upload the R script (Test1_UPI.R) along with your report**.
2. Sections from your R output should be embedded in appropriate places in your report. PLEASE NOTE THAT INCLUDING NON-RELEVANT OUTPUT MIGHT BE PENALIZED.
3. You will need to use different datasets to answers these questions. Datasets are available on Canvas:

Question 1

Use Data Set "test1-2022.csv".

This dataset (200 records) comes from a survey of high school students. This dataset reports students' standardized tests scores.

Variable	*Description*
ID	Student ID
Female	Gender (1=Female, 0=male)
Prog	Type of program (1=general 2=academic 3=vocational)
Read	Standardized reading score.

1. Run ANOVA model examining two factors- Prog and Female (Gender) with Read as dependent variable looking for main and interaction effects. Briefly explain your results.
2. Is interaction effect significant? If yes, which combination of Prog and Female produces the highest mean difference for the dependent variable? Use Tukey to report your answer. **Assumption check not required.**

Question 2

Use Data Set "alumnigiving.csv".

Alumni donations are an important source of revenue for colleges and universities. If administrators could determine the factors that could lead to increases in the percentage of alumni who make a donation, they might be able to implement policies that could lead to increased revenues. Research shows that students who are more satisfied with their contact with teachers are more likely to graduate. As a result, one might suspect that smaller class sizes and lower student/faculty ratios might lead to a higher percentage of satisfied graduates, which in turn might lead to increases in the percentage of alumni who make a donation. Data file: AlumniGiving.xlsx shows data for 48 US universities. The Graduation Rate column is the percentage of students who initially enrolled at the university and graduated. The % of Class Under 20 column shows the percentage of classes with fewer than 20 students that are offered. The Student/Faculty Ratio column is the number of students enrolled divided by the total number of faculty. Finally, the Alumni Giving Rate column is the percentage of alumni who made a donation to the university.

1. Develop a simple linear regression model that can be used to predict the alumni giving rate, given the graduation rate. Discuss your results and findings.
2. Develop a multiple linear regression model that can be used to predict the alumni giving rate, using the Graduation Rate, % of Class Under 20 and Student/Faculty Ratio as independent variables. Discuss your findings. Test for multicollinearity assumption. Compare models in part 1 and part 2.