University of Stirling
Computing Science & Mathematics
Faculty of Natural Sciences

MATU9D2 : Practical Statistics
PROJECT 2

1. REPORT

Write a short report on your answers to the **four questions** on pages 2, 3 and 4. Your report need not be typed but must be legible.

Each answer should include

(a) Details of the question
(b) Information on the choice of formal statistical test
(c) Full details of the formal & informal statistical analysis
(d) Conclusions
(e) Appropriate computer output
(f) Any comments on the data and results

2. ANALYSIS

Analysis MUST be undertaken using Minitab (include information on which version you are using).

3. GRADING

(i) The grade for this project makes up 15% of the final grade for the unit.

(ii) Marks are allocated for the write-up as well as the mathematics / statistics.

4. SUBMISSION

(i) Your answers should be submitted by **12noon on Friday 7 April 2017.**

(ii) The report should be submitted via the box marked ***"KATE HOWIE"*** outside **room 4B89**. **Ensure that you use the title page (download the version in Succeed) – enter your Registration Number (Do not put your name on any part of the project).**

(ii) You **MUST also submit your report and Minitab Project files** via Turnitin.

Work which is submitted for assessment must be a student's own work. All students should note that the University has a formal policy on plagiarism which can be found as item 6.8.4 on http://www.quality.stir.ac.uk/ac-policy/assessment.php.

CAH
17/3/17

QUESTION 1

Two samples A and B of plants of the same species growing on opposite slopes of a valley were dug up and weighed. The results were

A	27.1	41.3	15.7	3.9	22.2	36.4	12.8	16.3	14.7	16.2
	32.0	15.7	12.9	27.5	8.9	14.4	24.8	6.2		
B	11.7	15.3	19.1	22.0	5.7	15.1	19.1	23.4	15.8	12.3
	28.7	27.9								

Is there a difference between the average weight of plants on the two slopes?

QUESTION 2

A study of blood alcohol levels (mg/100ml) at post mortem examination from road accident victims involved taking one blood sample from the leg, A, and another from the heart, B. The results were

Case	A	B	Case	A	B
1	44	44	11	265	277
2	265	269	12	27	39
3	250	256	13	68	84
4	153	154	14	230	228
5	88	83	15	180	187
6	180	185	16	149	155
7	35	36	17	286	290
8	494	502	18	72	80
9	249	249	19	39	50
10	204	208	20	272	290

Do these results indicate that in general blood alcohol levels is greater in blood samples from the heart?

QUESTION 3

A study of immunoglobulin levels in mycetoma patients in the Sudan involved 20 patients to be compared with 20 normal individuals. The levels of IgG recorded for the 220 mycetoma patients are shown below.

The mean level for the normal individuals was calculated to be 1173 mg/100ml and the standard deviation as 150 mg/100ml before the data for this group was lost overboard from a punt on the River Nile. Is there any evidence that the IgG levels of the patients differ from the levels of the normal individuals in any way?

1047	1135	1350	1122	1345	1210	1067	1032	1002	1053
1377	1375	804	1062	1204	1103	907	960	960	936

(Question 4 overleaf)

QUESTION 4

The following data were collected during a study involving patients with cystic fibrosis. The variable of interest is PEmax (Maximal Static Expiratory Pressure in cm H_2O) which is a good measure of malnutrition.

The explanatory variables measured are age (years), height (cm), weight (kg), FEV1(Forced Expiratory Volume in 1 Second) and TLC (Total Lung Capacity). Several of these variables relate to lung function or body size.

The aim of our investigation is to identify from the possible explanatory variables a model which predicts PEmax well and also to assess how well the 'best model' predicts PEmax.

(i) Investigate whether FEV1 on its own is a good predictor of PEmax. i.e. look at both correlation and regression techniques to examine the relationship.

(ii) Find the 'best model' using the information we have to predict PEmax and discuss the results.

N.B. The data for Question 4 is on the Succeed – Project 2

You should copy this to your folder before performing any calculations.

You should answer the following four questions in relation to this data.