MATU9D2: Practical Statistics
Project 1

N.B. The grade for this project makes up 15% of the final grade for the unit.

Write a short report on your answers to the four questions on page 2.

Each answer should include, where appropriate,

- (a) Details of the question
- (b) The hypotheses
- (c) Informal analysis
- (d) Information on the choice of formal statistical test
- (e) Details of the formal statistical analysis
- (f) Conclusions
- (g) Appropriate computer output
- (h) Any comments on the data and results

Analysis MUST be undertaken using Minitab. Your report need not be typed but must be legible.

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

This report should be submitted via the box marked **"ANTHONY O'HARE** 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).

Your answers should be submitted by 5pm on Friday 24th February

1 Analyse the data in the file Project1.csv which contains the daily change in the price of Royal Bank of Scotland Group (The) PLC (RBS.L) stock from 1st January 2013 to 28th February 2014 (you will find the file on Suceed in the Projects folder). Your analysis should include the appropriate graphical and descriptive summaries.

2 A fizzy drinks manufacturer claims that their cans contain 330ml of 'refreshing, sugar-free rehydration'. A sample of 36 cans from their manufacturing line was tested and the amount of liquid in each can is given in the table below.

328.60	334.34	327.13	335.06	328.35	337.36	331.31	325.18	329.46
330.83	327.64	329.90	333.26	333.91	323.75	335.35	327.61	339.42
329.09	331.22	328.62	330.40	336.72	336.94	327.12	333.45	334.61
329.65	329.37	328.70	331.51	329.30	333.06	329.41	331.72	332.76

Investigate the assumption that the mean liquid level in each can is 330ml at the 5% significance level. You can assume that the amounts of liquid are normally distributed with a standard deviation of 3.67ml.

3 The average daily high temperature in the city of Stirling for the years 2000-2012 is given in the table below.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
7	8	10	12	15	17	19	19	17	13	10	7

Table 1: Average Daily High Temperature

Test the hypothesis that the temperature in Stirling is independent of the month of the year at the 5% significance level.

4 The salt content in a popular breakfast cereal was measured in a sample of 40 boxes of cereal and the measurements recorded in the table below.

3.44	3.37	3.45	3.48	3.50	3.49	3.53	3.55	3.47	3.56
3.46	3.52	3.54	3.52	3.43	3.42	3.60	3.47	3.37	3.51
3.53	3.57	3.50	3.42	3.36	3.59	3.55	3.37	3.40	3.50
3.46	3.47	3.48	3.39	3.41	3.37	3.49	3.35	3.46	3.51

Perform an appropriate hypothesis test to validate the manufacturers claim that the breakfast cereal contains no more than 3.5g salt with a standard deviation of 0.07. Use a significance level of 5%.