

## MATH 204 - MID-TERM

*Please Hand in Scripts in the Lecture on Monday 11th February.*

An experimental study of a number of cholesterol reduction therapies was carried out in two cities in the UK (Bristol and Leeds). In each city, subjects from a number of age groups were recruited, and randomly assigned to one of a number of therapies. Before the therapy, a basal measure of cholesterol was obtained from a blood sample. Each subject underwent their allocated therapy for four weeks, and at the end of the trial, another measure of cholesterol level was obtained. Thus the following data were recorded:

- Factor A: Age Group
- Factor B: Therapy
- Factor C: City
- Response Y: change in cholesterol level.

The data sets are available separately for the two cities, and pooled, in SPSS format (MidTermBristol.sav, MidTermLeeds.sav, MidTermPooled.sav), and plain text format, from the course website

[www.math.mcgill.ca/~dstephens/204/](http://www.math.mcgill.ca/~dstephens/204/)

Write a report on the analysis of the data sets, including annotated SPSS output where appropriate, addressing the following issues.

- (i) Summarize the design by finding the numbers of levels of the three factors and the number of replicates. Is this a balanced complete design? Justify your answer.

*5 Marks*

- (ii) Analyze the data from the two cities **separately**. Report the results of ANOVA-F tests of the hypotheses you deem appropriate, and comment on the validity of the analysis for these data.

*10 Marks*

- (iii) Analyze the **pooled** data in a similar way, assuming a **three factor** factorial design (that is, use Factor A, Factor B and Factor C). Report the conclusions of the three factor analysis.

*10 Marks*

- (iv) Given the results of all your analyses, report a conclusion as to whether the therapies alter cholesterol level, and whether the data from the two cities should be pooled into a single ANOVA analysis, giving a brief justification on each point.

*5 Marks*

**NOTE: Your report should consist of no more than EIGHT sides of paper (8.5in x 11in or 215.9mm x 279.4mm), including all SPSS printout.**