DATA ANALYSIS/ANALYTICAL AND NUMERICAL METHODS

Coursework 1: Numerical Data Handling

Aim

The aim of this coursework is to enable you get used to handling data in Excel, to making statistical decisions, and to presenting your work in a clear and easily understood format.

Assessment

This coursework is worth 10% of the whole module, or 1.5 credits.

Starting Instructions

Download the spreadsheet from Moodle by following the link from *Coursework 1 Data*. Enter your name in the cells indicated, but apart from this do not edit any of the existing cells.

You will see a set of horizontal coordinates (expressed in eastings and northings) that have been observed with GPS: this constitutes your data set. Copy the data and paste it into a new spreadsheet that will form the basis of your submission. You should do this using "paste special" and select "values". This will freeze the data, and avoid later complications.

Important note: you MUST enter your first and last names in the two cells marked ENTER & ENTER before you copy the data into a new spreadsheet. This will generate your own personal set of data. No marks will be awarded if you analyse the data belonging to someone called Enter Enter.

All students should clearly mark on their submissions the names that they have used to generate the dataset. Note that two-character names will not work, and so students should repeat characters to get at least three in each name (e.g. use "Xii" instead of "Xi").

Analysis

Generally you will notice that the positions determined are subject to noise, and this is noticeable as random errors. Occasionally, however, something goes more seriously wrong (probably caused by someone wandering past the receiver and blocking out the satellite signal) – this causes a gross error in the position.

You are required to find the mean position, and the standard errors in eastings and northings. However, you are also required to edit the data to remove any gross errors.

For the purposes of this exercise you may assume that the eastings and northings are essentially independent of each other, with separate normal distributions. Establish the z-score for each point in each direction, and reject any that fall outside the 99% distribution limits in either direction. Remember that as you reject points the original mean and standard errors will change.

Submission

There are two elements to the submission:

1) A report containing information on all relevant statistical tests, summaries of data, diagrams, etc. *Marks will be awarded for presentation*, as well as for getting the correct answer and following the right procedures.

   This report is limited to *one side of A4* and should be in PDF format.

   The file should be named:

   DAN CW1 Yyyyy_Xxxx

   where Yyyyy_Xxxx is your surname, followed by your given name.

2) The spreadsheet that you used to derive all the information in your report. We shall use this to check how the computations were carried out in case of errors and so on, but the PDF report should stand on its own without needing to refer to the spreadsheet.

Both these elements should be submitted via the link on the Moodle page for this module.

Deadline

The submission deadline is by 5 pm on the day one week after the coursework was set.

JCI
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