MEEN2250 Dr. Matthew J. Traum
Computer Aided Engineering University of North Texas (UNT)
Spring Semester 2009

Group Project 03:
Report Experimental Results Using Excel
[25 Points]

Last Updated 3/21/2009
By Dr. Matthew J. Traum

Proposed Experiment Write-Up Due: Monday, March 30, 2009

Spreadsheet File and Oral Presentation Due: Monday, April 13 2009 @ 1:30pm

The spreadsheet portion of this assignment is to be submitted digitally on your MEEN 2250 jump drive.

The oral portion of this assignment is to be presented in front of the class

Only one submission of each deliverable per team is required.
Associate all team members' names with the code file and final report.

Background

Engineers both in research and industry settings design and execute experiments, and they report the results to colleagues and superiors. MS Excel and MS PowerPoint are two important software tools used to analyze experimental results and showcase them respectively. To simulate these activities, teams will devise some sort of quantitative experiment in which a dependant variable changes as an independent variable is modulated. Teams will take experimental data from the research they devise; they will process and analyze this data using a spreadsheet; and they will summarize the results in a short PowerPoint presentation, which will be given to the class.

Grading

The assignment grade has three components which together total 25 points: 1) the proposed experiment write-up, 2) the spreadsheet file, and the oral project report. A maximum of 4 points will be given based on the proposal write-up, a maximum of 14 points will be given based on the spreadsheet file, and a maximum of 7 points will be given based on the oral presentation.

The following grading rubric items will be applied for the proposal write-up. [4 points total]

A. The proposal is well written; uses college-level English; follows proper technical writing protocols; and applies flawless grammar, spelling, and style in the narrative. (Note: technical writing protocols, style, and format were taught in ENGL 2700 and will not be repeated in MEEN 2250 – you should know them by now.) [1 point]

B. A meaningful research question is posed that can only be answered by carrying out an experimental study (in other words, the answer cannot be found on the Internet or within the technical or popular literature). A literature search with at least three references is required to demonstrate the state of the art. [1 points]

C. The proposal includes a plan of what will be measured and how it will be measured, and there is an identifiable independent variable and dependant variable. [1 point]

D. The proposed experiment can be realistically carried out within the resource constraints of the group and with the time allotted for the assignment. Groups must convince Dr. Traum that they can actually conduct the experiment they propose. [1 points]

Please include the word count of your essay in the header portion of your proposal. Proposals may not exceed 250 words (roughly one typed, double spaced page). Reports that do not include a word count or that exceed the 250-word limit will not be graded.

Dr. Traum must approve each group's experimental proposal for originality, rigor, and viability before work can begin. <u>Don't perform an experiment unless it is approved by Dr. Traum.</u>

The following grading rubric items will be applied for the spreadsheet file. [14 points total]

I. The spreadsheet presents experimental data in columns with dependant data correlated to dependant data, and columns are properly labeled and include units for variables. [1 point]

II. Evidence exists that some spreadsheet calculation operator or function was used to process the data (for example, an operator for conversion from minutes to seconds or a function to take average or standard deviation of data). [1 point]

III. In generating the spreadsheet data chart, the proper chart tool was used (for example, XY Scatter Charts for correlated data, NOT line charts). [1 point]

IV. On the chart, both the X-axis and Y-axis have sensible min/max values, correct intervals, and are sized to maximize use of space. [1 point]

V. On the chart data labels and axis labels are of appropriate size, are centered under axes, and do not obscure data. [1 point]

VI. On the chart, X-axis and Y-axis labels correctly represent the measured values and carry proper units. [1 point]

VII. On the chart, experimental data is represented by discrete points, not continuous lines. [1 point]

VIII. On the chart, proper error bars are added to all experimental data with respect to the dependant variable and (if necessary) the independent variable. [1 point]

IX. On the chart, data markers are discrete geometric shapes (no "X" or "*" or "–" makers) with a unique shape to discern independent data streams. [1 point]

X. Appropriate colors represent each data set. Colors are easily distinguishable and are common shades (i.e., red and blue NOT lavender and mauve). When possible, colors should represent intuitive data trends (i.e., 'hot' temperature data is red while 'cold' temperature data is blue'). [1 point]

XI. Individual data markers are of an appropriate size and uniform color showing discrete nature of experimental data. Supplemental effects such as shading and color gradients are removed. [1 point]

XII. All meaningful data is represented; there are no erroneous gaps in data representation, and superfluous data is omitted. [1 point]

XIII. Gridlines for both X and Y axes are present and appropriately linked to major axis delineations. [1 point]

XIV. An appropriate curve fitting routine is used in an attempt to correlate the data and an R value is given to determine the quality of fit. [1 point]

The following grading rubric items will be applied for the oral presentation. [7 points total]

α. All team members are present and everyone speaks at least once. [1 point]

β. An overview of the team's research experiment is given on no more than one slide, which explains what research was done and why it was meaningful. [1 point]

γ. A schematic of the test apparatus is given on no more than one slide to show how the experiment worked. [1 point]

δ. Pictures of experimental execution are given on no more than one slide to prove that the group actually completed the proposed research. [1 point]

ε. Proper oral presentation protocols are followed; speakers are clear, concise, understandable, and speak loudly enough; it is evident that the presentation was rehearsed prior to delivery. (Note: oral presentation protocols were taught in ENGR 2060 and will not be repeated in MEEN 2250 – you should know them by now). [1 points]

ζ. Font on all slides is uniform and of appropriate size and style to be seen, even in the back of the room [1 point]

η. The team finishes its talk within the allotted time (5 minutes). [1 point]

Notes:
1. Each member of the group will share the same grade on this assignment, and group assignments will not be dropped when calculating students' course grades.