IAM 550 Lab Report Guide

Prof. Raeder, Fall 2019

All laboratory reports are to be submitted in technical memo format. These are concise and to-the-point reports. The maximum length of the written portion is 2 pages, 12 point, Times Roman or Calibri font, one inch margins. Each student will submit their own report. All reports must be typed, and all plots and tables must be computer generated. Furthermore, all reports must be proofread and subsequently signed by another student in the class. Memos that are not proofread will not be accepted for grading. (This is how it is done in business. For bigger reports/proposals it is called red-teaming.) Everyone (memo writer, proofreader, teaching assistant) benefits from this process of constructively critical proof-reading. Lab reports are due as hard copy (printout) at the next lab unless otherwise stated. The memos should be organized as follows (copy this as a template, replace instructions with your text and figures):

Heading:

This portion of the memo contains the title plus the student's name and signature, the date, and the name and signature of the proofreader, e.g.,

IAM 550 Laboratory 4: Non-linear Springs

Report author: Jane Writey   (signature)
Author e-mail: writey@spymail.com
Proofed by: Joe Proofy   (signature)
Date: October 14, 2017
Grader: leave open

Introduction:

The topic and numerical methods pertinent to the lab are introduced in this section. As with all sections, be concise. Make sure to state both the physical situation given in the lab assignment as well as the numerical technique(s) being utilized. Everything must be written in your own words. Do not copy and paste any portion of the given assignment into your report.

Methods:

The methods section gives a general overview of the numerical method and MATLAB programming techniques used in the laboratory. DO NOT include a play-by-play of your MATLAB procedure. Except in rare cases, there should be no MATLAB syntax or variable names

in the body of your report. The goal of the methods section is to give the reader a broad sense of how you modeled the given physical scenario; the code attached in your appendix will give the details. Don't let the details distract you from the broad picture, and tailor your memos to focus on the pertinent material.

Include any equations explicitly given or methods referenced in the assignment using an equation editor (Word or LaTeXiT). All equations should be on their own line, numbered, and include a brief description. For example, the backward difference formula, used to approximate the derivative at a point, is

$$\frac{df}{dt}(t_i) \approx \frac{f(t_i) - f(t_{i-1})}{t_i - t_{i-1}} \qquad (1)$$

Results:

The results of the laboratory are referenced and described in this section. For the purposes of keeping the written portion of the memo less than two pages, the actual code, tables and plots of results are numbered and put in the appendix, but you refer to them here. Describe the main relevant features exhibited by your findings. For each graph or table presented in the appendix, assume that the reader may not notice even blatantly obvious patterns or features—succinctly direct your audience to the relevant points of interest.

Please read the lab report carefully to make sure you are including all the required deliverables. If the lab asks you to calculate something, that result needs to be included in the results section of your report. This is an area that students often needlessly lose points on.

Conclusions:

The conclusion section should briefly state what the implications of your results are. Include scientific conclusions only. Your discussion/conclusion should be free of all personal judgments or opinions. You will want to avoid any, "I learned . . . " type statements. You should also be careful with phrases like, "the solution makes sense" or, "the solution seems reasonable". These are fine beginnings to a conclusion sentence, but they are missing a, "because . . . " where you justify the validity of your solution with facts. Phrases like, "Herein we have found . . . " or, "The results indicate . . . " may help to get you started.

Appendix:

This section should include all scripts and any tables of computed results, graphs, equation, or hand calculations. When we start working with functions, do not forget to include the code for your function as well as your main script. Your diary should not be included in the appendix.

Further Comments about Lab Reports:

- Do not write lab reports together. Changing the wording slightly between papers does not a new paper make. This is not acceptable, and will result in a zero for both students.

- Avoid "filler" words. As long as all the necessary information is included, a well thought-out paper will not be docked points for being too short.

- Please read the comments that we write on your individual lab reports. We take the time to comment to help you highlight issues to avoid in the future. If you have any questions, please join us in our office hours—we're more than happy to help!

- Please proofread your writing. Your proofreader should also be able to help you improve your clarity, layout, and grammar as well as check for completeness. You should strive to complete the first draft of your report early enough that your proofreader has adequate time to look it over. This is a great opportunity to help each other improve your writing. The ability to clearly convey ideas is an important skill not only in academia but more importantly in your future job.

- Your reports should not include bullet lists. Please use full sentences and full paragraphs.

- Do not include code snippets in your report. To talk about a specific section of the code, reference the line number and location in the appendix where it may be found.

- No screen-shots. All MATLAB figures should be saved as a graphics file (jpeg, png, etc.) and imported into your document. Equations should be entered using an equation editor and should never be clipped from the assignment sheet.

- All graphs, tables, and scripts should be numbered and located in the appendix. Include a caption as well as a title, legend, and axis labels. If there are multiple plots on a single graph use different colors or line styles to differentiate between them. Keep in mind that if you print in black and white you should use different line styles because colors will often look the same.