Sample Lab Report

and some points to obtaining a good lab grade

0. Preface, Introduction, and/or Abstract

Every good lab report begins with a preface, introduction, and/or abstract. Even though it is the first item in a lab, it is usually written last. Choose "preface" if you are a novelist; choose "introduction" if you are a humanities major; and choose "abstract" if you believe your lab report is a journal-quality submission—i.e., it uses words like "novel", "et al.", and "a posteriori". This section should describe what you demonstrate in the lab. No more than five sentences should be necessary; in the age of information overload, a short, succint, precise, informative, technical abstract (and report style in general) that goes to the point is more likely to have impact. In practice, professionals and researchers often decide only on the basis of title and/or abstract whether or not to continue reading the remainder. Less is more.

1. Sections

Each section in the lab guide (lab note) should have a corresponding section in the lab report. Answers to questions, including code and figures, should appear under corresponding section numbers. At the beginning of each section, describe what you will demonstrate/explore in that section. Just like the introduction section, this part is written once the section is complete. No more than two clear and carefully written sentences should be necessary.

When answering questions posed in the lab, *prose* is preferred to "No", "Yes", "Nah", "Yep", "Hmm", "Umm", "Maybe", "Dunno", "ROFL", "JFGI", etc. These type of answers will not receive full credit, even if they are correct.

For text, do not use double spacing, and if possible, do print double-sided. The objective of the lab report is not to impress your professor with a lab report that

looks like a PhD dissertation from several feet away. Feel free to use this sample lab report as a template for your own. You can copy and paste the figure table, with autonumbering, into your own document.

Including code in your lab report should be formatted like `CODE`: NO DOUBLE SPACED CODE. Use the "Courier" font for code and **single space**, different from the font of the text. Your **code must be copy-pastable** from your PDF report with standard PC tools, so that it can be executed in MATLAB for evaluation and marking after submission. Here is an example:

```
10 INPUT "What is your name: "; U$
20 PRINT "Hello "; U$
30 REM
40 INPUT "What percent grade do you deserve (0-100): "; N
50 S$ = ""
60 FOR I = 1 TO N
70 S$ = S$ + "HA"
80 NEXT I
90 PRINT S$
100 REM
110 INPUT "Do you want me to laugh more (Y/N)? "; A$
120 IF LEN(A$) = 0 THEN GOTO 110
130 A$ = LEFT$(A$, 1)
140 IF (A$ = "Y") OR (A$ = "y") THEN GOTO 40
150 PRINT "Goodbye you silly weasel!";
```

All figures should have captions, and be appropriately included. You can make image files from MATLAB by choosing "Save" from the figure window menubar, or if you get smart you can have MATLAB automatically save the figure to the desired file format (`help print`). You can deposit them into your Word document by dragging. Images should not take up entire pages; on the other hand, all content in each plot should be legible without needing magnification (recall that the reader may have printed the report and may not have access to electronic magnification). Appropriately size them within Word. Take special care of the font size for axes labels, ticks, and legend text (use `plot(…,'Fontsize',<number>)`). Consider using (semi-)logarithmic scales where these show particularly simple relationships (`semilogx()`, `semilogy()`, `loglog()`).

Here is an example that is undersized:
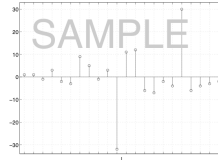
Figure 1: An undersized figure. Notice how much your eyes strain.

And here is an example that is just right: (on the next page)
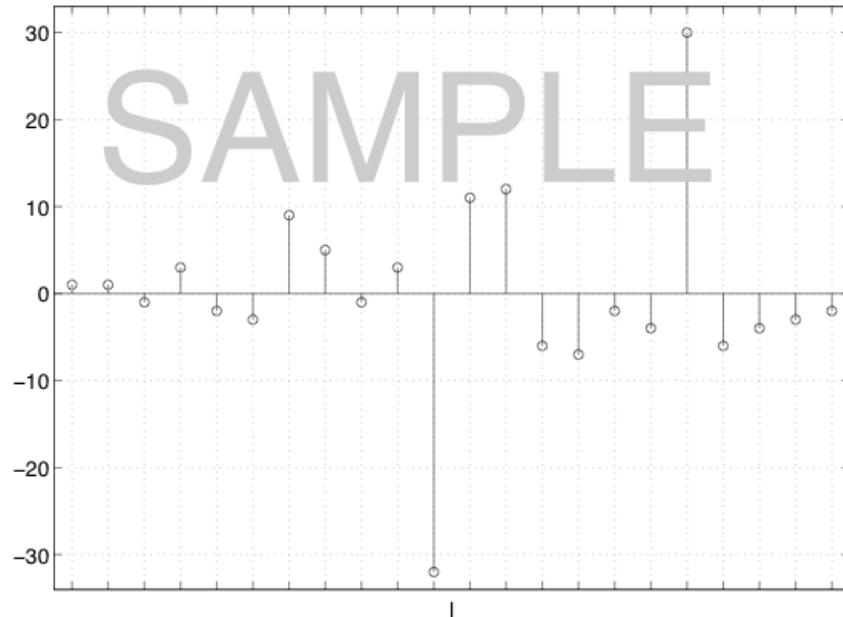
Figure 2: A perfectly sized figure. Note how little your eyes strain to read the ordinate units.

2. Conclusion

All good articles, papers, lab reports, include a conclusion. In part, it should reword key results, findings, and parts that already appeared in the abstract and/or introduction, with some additional comments informed by the analysis, lessons learnt. No more than five sentences should be necessary; and they should not be the same five sentences of the introduction, no matter how they are permuted.

3. Acknowledgments

If you feel so inclined, you can include this section to acknowledge those people and/or organizations that have helped you get where you are today, for instance,

a particularly helpful demonstrator or professor, a scholarship, a family pet, etc. This section should definitely not be longer than your introduction or conclusion!

4. Turning In

The lab is due when your professor says it is due where your professor says it is due. Do not get behind, as the work will become unbearable, and you, like a moth to a flame will become, young *Icarus*.

You can store draft versions of your report without limits, but QM+ allows you only **one** submission attempt. So carefully check your final version. Make sure you actually submit your work by hitting the Submit button in QM+. Draft work (even if it was saved on QM+) that has not been formally submitted will **not** be marked or otherwise assessed.

After uploading, double-check that your file has not been corrupted in the process, by downloading your report from QM+ and opening it in Adobe Acrobat immediately after submission. Any problems with opening or viewing your submission for assesment cannot be accepted after the submission deadline has passed.

No hardcopies nor e-mail attachments are acceptable as submissions.

5. Tips

A great lab is short and to the point, and should make a professor weep. The answers given are complete; and the figures are understandable. A bad lab is long and circumlocutious, and will make a professor cry. The answers given are confused and confusing; and the figures are drawn in crayola embellished with coffee stains. Either way, the professor should shed tears and scream.

Get to know your demonstrator and lab section by attending! Doing work at home is isolating and not recommended. It's a precursor to professional life and what

will be expected then from you. Lab section can be fun and sociable, especially since we do not need chemical hoods.

The internet, and the World Wide Web in particular, is a wonderful resource. In my years of teaching this module, I have seen more and more students take advantage of that seemingly endless information resource. I have also seen more and more students "solve" lab questions in the strangest ways learned from stackexchange and sources like it. When I ask such a student to explain their solution, they usually shrug furiously to try to get an A for effort. All that you need to know is covered in the tutorial (lab 1), and introduced in each lab. *Do not use the symbolic toolbox*. Use "help" in MATLAB. Do not use someone else's code.

Carefully check to make sure you have actually submitted the correct thing. Once the lab solutions are posted, we cannot accept any other work nor updates.

Finally, lab work is individual, <u>not</u> group-based! You can work together to solve problems, but the report and all its contents that you submit must be your own!

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