

NENS 230, Final Project Guidelines

Proposal Due: **December 2nd, 2014 before class**

Report Due: **December 9th, 2014 at midnight. This is a hard deadline!**

Goals

- Explore a dataset of your own choosing
- Build a complete data analysis pipeline, from importing a dataset to analyzing it to writing up your results
- Concisely and clearly communicate conclusions from your analyses

Description

For your final project, we want you to explore on your own and develop an independent project using Matlab. This should consist of a complete data analysis pipeline, where you import a dataset, analyze it, generate figures to demonstrate your results and convey those results and your conclusions in a concise write-up.

The dataset that you choose to work with is completely up to you, and can be something you have collected in your own lab, from a friend or colleague, or from a publicly available dataset. One potential source for data are the built-in datasets in Matlab, which are listed at http://www.mathworks.com/help/stats/_bq9uxn4.html. The analysis can be a completely new project or part of something larger that you are working on. We want this to be fun and useful, so work on data that you care about!

We will ask that you submit both your code and your data so that we can run your code and check out the analysis, rather than just looking at printed figures (we will keep your data and write-ups confidential). As for the scale of the project, it should take you roughly the time of 2-3 problem sets (and subsequently, you have three weeks to work on the project). Please email us if you have questions about the scope of your project. If you choose to work on a very hard or large-scale project, you can submit partial progress, it doesn't have to be a completely polished product.

Proposal

E-mail us with a paragraph describing the basic idea of your project, the dataset you are going to work with, and any problems or progress you have made by December 2nd, 2014. This is for us to make sure your project is reasonable. (December 2nd is the day of the last class).

Write-up

For the final report, you will submit a write-up of your work along with your code, figures, and data. The write-up should contain no more than two (2) pages of text. You should also include and describe any figures in your write-up, these don't count towards the two page limit. We will use the write-up as a guide to figure out what you did, what parts of the code we should run in what order to test it, and the meaning/significance of your project. Specifically, make sure to include the following:

- A problem statement / introduction describing the motivation and significance of your project. This does not have to be fancy or impersonal: we just want to know why you care about the particular dataset you chose, and why you decided on a certain kind of analysis.

- A layman’s introduction to your dataset, and a description of how you collected or obtained your data.
- A clear distinction regarding what code you wrote for this project, what was written previously, and what (if any) you used from other sources.
- Figure captions for all of your figures. Please make sure that your figures labels are readable, your labels have units if necessary, and include legends where appropriate.

You should write the report for a generic scientific audience. Please avoid jargon specific to your subfield of biology! An example write-up is given on the course website (this is just the write-up, no code is provided). Make sure your write-up is more detailed than our example, ours skims on lots of details.

Grading

You will be graded according to the same check/check+ scale we have been using all quarter. We will grade you based on how well your code is written, your write-up, and if we are able to cleanly run your code. We expect your code to be have extensive comments documenting your analysis.

Submission

To submit your project, zip up all of your code and data and send it to `nens230-aut1415-staff@stanford.edu` with the text ”+[Final Project]+” in the subject line. Alternatively, you can share a link to a shared Dropbox folder with your code and data in it. In addition, send us your write-up (preferably in PDF format). *Please don’t use the publish command, as it is much easier to run your code if we have the original m-files!* The submission deadline is a strict deadline.