NSC574: Statistics Workshop

Credits: 1–4
Level: Multi-level
Prerequisite: Statistics (NSC123) or permission of instructor
Location: Sci 217
Times: TuTh 8.30–9.50am and by arrangement
Instructor: Matt Ollis, `matt@marlboro.edu`
Website: `http://cs.marlboro.edu/courses/fall2014/stats_workshop/home`

Content and Structure

The purpose of this workshop is to build on Statistics (NSC123) in a way that directly supports your academic goals. This could include anything from gaining a deeper understanding of some statistical techniques of particular relevance to your main field of study to analysing data you've collected as part of a plan research project.

The precise structure will depend on the number of students in the class and the various goals that you have. Each of you will submit a proposed program of study, including what you want to achieve and how you will be evaluated. Whatever your individual goals, you'll be expected to take an interest in others' work. However you choose to have your own work evaluated, in addition to that a large piece of your grade will depend on your engagement with the work of others and how you share your own work with the group. Math is a collaborative process and being part of that collaboration is a vital component of this class.

Early on in the semester I expect that most of the work will be done in groups, as you will likely have some shared general goals. As the semester progresses the groups will tend to get smaller, and probably as small as one member in each by the end. Every two weeks we'll have a session where everyone presents their work to everyone else; breaking your program for the semester into two week chunks is highly recommended (although don't feel forced to hit a big landmark every two weeks precisely; sharing work in progress is strongly encouraged).

How we spend the time between these presentation sessions is completely open. It depends entirely on the goals you all have, but it'll probably be a mix of individual meetings, working in groups, troubleshooting sessions,... and whatever else we deem most useful.

We'll use the statistical programming package `R` throughout, along with the graphing package `ggplot2`. Based on previous iterations of this class, I suspect that spending the first two weeks, at least, on a refresher/intro to these will be useful for everyone.

This course is not a replacement for Statistics (NSC123). While topping up on some topics that you haven't seen from that class if you have a different background in stats is a good

use of the first part of the semester here, if you seen very little of the content of that course you will be better served taking that in the Spring.

Here are some loose suggestions for some topics you might study. In most cases they are enough to make an entire course out of individually but you can look at any of them for smaller chunks of time: data visualisation, regression, ANOVA and related tests, non-parametric statistics, sampling, probability theory, experimental designs,... I'm sure there are lots more. I'll talk more with you about what best fits your interests and academic goals, but I also recommend talking with (potential) plan sponsors to see what they recommend. And of course if you are on plan already and have something specific in mind that you need to work on, that's perfect too.

What To Do Now

Think about what you'd like to achieve in this course and jot down a few notes. Show up to class on Thursday ready to summarise and discuss your thoughts. Think about including: a list of topics you'd like to cover; how you'd like to be evaluated; how this fits into your education; how many credits you want (remember: one credit is about an average of 3hrs/wk work over a semester); what you might want to get stuck into first. This is just to start the conversation—you won't be committed to following the path you identify, nor are you guaranteed that I'll approve what you suggest. Of course, you're very welcome to chat with me in the meantime to help refine your ideas.

Also, make sure you have access to a machine with `R` and `ggplot2` (if you have sufficient privileges then inputting `install.packages("ggplot2")` to `R` once should make it available; to use it you'll need to type `library(ggplot2)` at the start of each session).

Academic Integrity

You are expected to be aware of the college's policy on academic integrity and to abide by it. It can be found on the college website, and is linked from the course website. In particular, be careful not to "double-dip". While close links to your work outside this class are strongly encouraged, any work you do cannot count for credit twice. Please come and talk to me if anything is unclear.