

I will update this periodically to fill in more concrete details.

This is a more open-ended lab than the previous ones and the expected scope of the lab is also a bit larger. I will not regularly be assigning homework throughout the remainder of the course because I want this lab project to be your primary focus. You may work in pairs or alone; if you work together, the scope of your project will be slightly larger.

1. Think about what kind of question you would be interested in studying. Come to office hours or set up a meeting to chat about your question. I should know what your plan is by Monday, November 6th.
2. Get your hands on the data. I can help if need be. You will probably want to load your data into a separate Mathematica file, the program will naturally communicate between windows as long as you don't quit the kernel. Write some code to implement whatever tests you want to do. Alternatively, start working on the problem (if it's a more theoretical question).
3. Questions to ask yourself at this point: What are the interesting features of my data? Where is the difficulty? What methods are likely to be helpful or accurate? What am I answering? What do I have hope of being able to find?
4. ~~If things go according to plan, I will have found a relevant journal article for you to read. The other possibility is that I ask you to learn something, eg. computing Lyapunov exponents in higher dimensions. If I give you a paper, read it and make annotations throughout about the usefulness of the techniques that they implement, how you might apply it to yours, any notes that you need to understand the theorems Turn this journal article in with your assignment. If I ask you to learn a new technique, do at least one example by hand and turn it in.~~
5. Run some tests, make some figures and caption them nicely. Look in a few scientific or applied math journals to see how this is done.
6. Write a summary of your work. Describe the question that you sought to answer and include some relevant background (you do *not* need a full literature review). Report the results of your tests and why you applied them. Give some interpretation of your findings - if they are wildly inconclusive and inaccurate, tell me that. If it is not, well, tell me why. This write-up should be approximately one page single-spaced (or the equivalent), not including figures.

7. I will ask for a rough draft on Friday, November 10th and will turn around and give feedback then. You are welcome to run anything by me (including a rough draft) beforehand.
8. On the last day of class, Monday, November 13th, we'll have an informal chat about the projects that everyone worked on.

Further notes: If you have ever wanted to get started on LaTeX, now is your chance and I am happy to help. Otherwise, Word should certainly work well enough. If you want to work in Matlab, that is fine. Alex Barnett has some resources on his course webpage, although I will be less able to assist with coding in that language.