

Term Project

Goal:

The goal of the project is for each team to find something in their (non-cs) discipline that would be useful for them to know how to do, now or in a future job or in graduate school. The project needs to be able to be accomplished with the skills we are learning this semester.

Topic:

To figure out a good project you might want to ask faculty, graduate students, or people who work in the career you are interested in, what programming tasks they do (or wish they could do).

Here are examples of previous student projects:

- Simulation and Data Collection of Viruses Worldwide
- Heredity Probabilities for Single Nucleotide Polymorphism Involved in Inherited Diseases
- Dictionary of Birds: A Program written for Elementary School
- DNA and RNA Sequencing with Python
- DNA sequencing data mining for genetic markers discovery and characterization
- Water Contamination in California Schools: Visualizing Preliminary Results and Scripting Future Updates
- Downloading Parcel Data for Use in a GIS
- Leptin vs. Body Weight over Time
- Injury Recovery Statistics with Python Programming
- Organized Search Using Biochemical Assays to Identify Microorganisms
- Genome Assembler
- Simulation of the heart
- Database of Local Birds
- Mass spectrum database for spectrum evaluation of beer for complex matrix compound characterization
- Twitter and Python and Gun Rights, Oh My! Gauging Public Sentiment Toward the NRA on Twitter
- The Agricultural Impact on Squirrel Body Condition and Dispersal
- Predicting Slope Stability with Python
- Woodward Reservoir: Well Sampling Data

Another option might be to work through the computations of a scientific paper or report to see if you can replicate or extend them. Here is an example of a geography-based report:

<http://eig.org/wp-content/uploads/2016/02/2016-Distressed-Communities-Index-Report.pdf>

General Plan:

You will need to:

- Form a team
- Write a proposal
- Get data (this may involve interfacing with or creating a database)
- Pre-process, clean, reformat the data
- Do something with the data
 - compute statistics
 - create graphs
 - match sequences
 - find substrings
 - create databases
 - map
- Output as appropriate
- Write a report explaining your project and findings

Getting Started:

The first step is to meet with your assigned team members.

Next step is to choose a topic (see discussion above).

Then write a topic proposal. I will meet with each group to discuss the proposal to make sure that it is appropriate for the course.

Topic Proposal:

The proposal should include:

- Introduction: Background and Motivation
- Goals and Objectives
- The data
- Work plan with a timeline
 - Reading
 - Design
 - Programming
 - Testing
 - Writing summary
- References - in appropriate format

Note that the more of this you nail down now, the more you will be able to paste into your final report. Also, the feedback that I get from employers includes the desire to have students get more team experience.

There will be a written report required and a 15-20 minute group presentations at the final exam time.