Major projects

30 pts (negotiable)

These are very basic ideas for projects. You must flesh out the details of what the project will involve, and get it okayed by me. It should be something that will require perhaps 3-4 weeks of work. In all cases the project should involve coding by you, not just amount to (for instance) installing Wordpress and building a site with their tools; you *can* use tools like Wordpress, you just have to build on them.

Minor/medium tasks can be part of a major project, for separate points.

- interactive video (using HTML5)
- multiplayer online game
- real-time, graphical, browser-based game
- build and run a twitterbot
- design a social media site (you're not going to completely replicate Facebook or the like, but make a working prototype of something, preferably based on some new idea that makes it different from existing sites)
- online data / web service mashup, e.g. using one or more services listed at http://www.programmableweb.com/; see also http://buffaloopendata.com/
- electronic poetry generator (browse http://epc.buffalo.edu/)
- digital humanities tool (what does this mean? we'll have to see)

Starting tasks

(only available to those who haven't taken DMS 110, CSE 113, CSE 115, or equivalent)
Some things to get you comfortable with your programming language of choice, and basic coding elements (loops, if/then, lists, etc).
These tasks may be done twice, for two different languages, if desired (eg once in Javascript, once in PHP). A maximum of 5 points, total, may be earned.

1pt given a list of numbers, compute the average
1pt given a list of numbers, find the largest number
1pt given a list of words, compute the average length
1pt given a list of words, concatenate them into 1 string

Minor tasks

In subsections with lists (eg "web development tools"), you can do as many as you like; each line is worth the specified points, but "or"s are mutually exclusive (you can earn 2 pts for heroku OR 2 pts for openshift, plus another 2 pts for github, etc)

2pt learn web development tools – download a package or sign up for a service, then go through a

step-by-step introductory tutorial:
    - jquery
    - scriptaculous
    - heroku or openshift or ...
    - github or bitbucket
    - Twine
    - Undum
    - HTML5 canvas (nothing to download or sign up for, just find the tutorial)
    - QR codes

2pt   encryption using a simple substitution cipher
    1. given a table {'a':'o', 'b':'p', ... }, write functions to encipher or decipher a string; your code should run them on some predefined text
    2. compute the table for a particular offset, then use it

2pt   write a Euclidean distance function, use it to find the point in a list which is nearest to some given point

2pt   ask for a password, use a one-way hash function to compare it to a saved password, print a message saying whether it matches

3pt   text processing:
    - given a large text file, read it, and report how many bytes are in it

    - given a string, split it into words & print an HTML list with 1 word per line

    - given a large text file, read it, and
        1. report how many words are in it
        2. count # of times a given word occurs (see
http://www.nytimes.com/interactive/2008/09/04/us/politics/20080905_WORDS_GRAPHIC.html?_r=0
for a more advanced application of this)
        3. find the most popular word(s)

    - censor some text - replace all occurrences of certain words by '[redacted]'
    - make it replace a series of target words by a single '[redacted]'

    - spam filter - check text for target words; if more than some number or percentage are found, tag it as spam

Medium tasks

5pt   use a database: create a database using MySQL or other DB tool, query it / store information in it from a program

5pt   using HTML5 canvas or drawing package (GD in PHP, PIL in Python, etc):
    - given a list of points, draw dots or lines on a map image
    - read an image, find the min, max, and average R G & B

5pt   Markov chains:
    1. given a set of words, build Markov table for letters, generate a new word
    2. do the same for a text file, with words as the atomic element (ie generate random sentences)

5pt   simple interactive fiction
    - make a branching story with a command-line interface - print text, ask user for choice
    - make a branching story on web (ie output HTML, use links for branches) – must be done in code, not pure HTML
    - do the same, but storing all the narrative & connections in a data structure, rather than hard-coding all the branches as if/thens

5pt   password cracker: given a hashed password & a list of common words, test the password - try to guess it. add '1', '2', etc to the words

5pt   draw a Mandelbrot set using ASCII art

Theory / Research

30 pts

Topics to research and give a presentation, write a short paper, or make a project around. As with the "major projects", this should involve significant work and revisions.

- online privacy (NSA snooping, monitoring by big companies, etc)

- Wikileaks

- free software development

- diversity in the tech industry and/or education

- a major web artist

Responses

1 pt for each in-class written response to a lecture or topic