

CS631 -- Advanced Programming in the UNIX Environment - Midterm Assignment

Midterm Assignment: Implement ls(1)

Summary

The objective of this assignment is for you to write a significant system tool from scratch. In doing so, you will learn many details of the UNIX filesystem and the general system concepts we have covered in class.

Problem assignment

Implement the ls(1) command as described in the manual page provided to you [here](#).

Please note that this manual page describes a subset of the options available on most systems, so please make sure to consult only this page as reference.

Your program must follow the [general homework guidelines](#).

Your code should be easily readable and contain comments **where necessary**. You should look at [this file](#) for examples of good coding style. Follow these guidelines!

It is a good idea to make use of a *revision control system*, such as [Mercurial](#), [Git](#) or [Subversion](#) to allow you to better track your progress. Often it also makes sense to split functionality across separate files; you probably do not want to submit all code in a single file.

Deliverables and Due Date

Snapshot

You must submit a compilable and working snapshot of your project by 2015-10-05, at 16:00. By then, you should have implemented some basic functionality and some of the command-line options. It does not need to work without errors or bugs, but it shouldn't segfault either; it should just show that you are making progress. Failure to submit the snapshot on time will result in a 10% deduction from the grade for the midterm project.

Final submission

You will submit a single tar archive named *username-midterm.tar* that will extract into a directory named after your username. In that directory will be at least a file named `ls.c` and an optional Makefile. If you have any commentary on your submission, include it in a file called `README`.

For example, I would submit the file `jschauma-midterm.tar` which might and compile as follows:

```
$ tar xvf jschauma-midterm.tar
jschauma
jschauma/Makefile
jschauma/README
jschauma/cmp.c
jschauma/ls.h
jschauma/ls.c
jschauma/print.h
jschauma/print.c
$ cd jschauma
$ make
$
```

The due date for this assignment is 2015-10-19 16:00. Please attach the file to an email sent from your `@stevens.edu` email address to jschauma@stevens.edu with a subject of "[CS631] midterm".

Extra Credit

For 15 extra credit points, implement the `-c` option ("Force multi-column output; this is the default when output is to a terminal."), which nicely formats the output similar to the way the OS provided version of `ls(1)` does.

For 5 extra credit points, implement the `-x` option ("The same as `-C`, except that the multi-column output is produced with entries sorted across, rather than down, the columns.").

Both of these options take the `COLUMNS` environment variable into account.

[\[Course Website\]](#)