

CSCI 3194 (Seminar (UNIX Power Tools)), Fall 2014

Homework 4

Credit: 20 points.

1 Reading

Be sure you have read the assigned readings for classes through 11/05.

2 Programming Problems

Do the following (sort-of-)programming problem. Turn in your finished makefile by sending mail to `bmassing@cs.trinity.edu`, with the file as an attachment. Please use a subject line that mentions the course number and the assignment (e.g., “csci 3194 homework 4”). You can do this assignment on any system that provides the needed functionality, but I will check it on one of the department’s Linux machines, so you should probably make sure it works in that environment before turning it in.

1. (20 points) Suppose you have a C program consisting of the following files:
 - `some-defs.h` containing macro and constant definitions.
 - `foo.h` containing constants and prototype definitions for function `foo`.
 - `foo.c` containing code for function `foo`. This file contains `#include` directives to include `some-defs.h` and `foo.h`.
 - `bar.h` containing constants and prototype definitions for function `bar`.
 - `bar.c` containing code for function `bar`. This file contains `#include` directives to include `some-defs.h` and `bar.h`.
 - `main.c` containing code for the main program, which calls functions `foo` and `bar`. This file also contains `#include` directives to include `some-defs.h`, `foo.h`, and `bar.h`.

Write a makefile that:

- When you type `make main`, creates executable `main` from the source files, compiling just the parts of this program that need to be recompiled (because either source code has changed or an `#include`’d file has changed). Compile using any C compiler (`cc` or `gcc`) but using the flags `-Wall`, `-pedantic`, and `-O`.
- When you type `make clean`, deletes all the object files for the program.
- When you type `make xclean`, deletes all the object files for the program and the executable.

You can make use of the implicit rules defined by `make` if they will help. (They probably will.) Here are some test files you can use to test your makefile:

- `some-defs.h`¹

¹http://www.cs.trinity.edu/~bmassing/Courses/CS3194_2014fall/Homeworks/HW04/Problems/some-defs.h

- [foo.h](#)²
- [foo.c](#)³
- [bar.h](#)⁴
- [bar.c](#)⁵
- [main.c](#)⁶

Be advised that the command `touch` can be used to change a file's timestamp without opening it in an editor, etc. (This may be helpful in testing.)

²http://www.cs.trinity.edu/~bmassing/Classes/CS3194_2014fall/Homeworks/HW04/Problems/foo.h

³http://www.cs.trinity.edu/~bmassing/Classes/CS3194_2014fall/Homeworks/HW04/Problems/foo.c

⁴http://www.cs.trinity.edu/~bmassing/Classes/CS3194_2014fall/Homeworks/HW04/Problems/bar.h

⁵http://www.cs.trinity.edu/~bmassing/Classes/CS3194_2014fall/Homeworks/HW04/Problems/bar.c

⁶http://www.cs.trinity.edu/~bmassing/Classes/CS3194_2014fall/Homeworks/HW04/Problems/main.c