1   System design

I laid the program out into three main parts: parser, sorters, and suppressor. I originally planned on forking all three from one function (and then passing the run function to utilize through a function prototype) but this proved to be infeasible so I went with specialized forking functions.

2   Work log

```
Date:    Mon Feb 4 22:05:40 2013 -0800
Date:    Mon Feb 4 17:57:20 2013 -0800
    Fixed errors preventing writeup from compiling
Date:    Mon Feb 4 17:48:32 2013 -0800
    Switched to provided template, won't compile..
Date:    Mon Feb 4 17:23:21 2013 -0800
    Update to writeup
Date:    Mon Feb 4 17:05:21 2013 -0800
    Deletes
Date:    Mon Feb 4 17:02:40 2013 -0800
    Changed hierarchy, working on writeup
Date:    Mon Feb 4 11:03:13 2013 -0800
    Finished makefile
Date:    Mon Feb 4 10:41:22 2013 -0800
    Begin work on write up
Date:    Sun Feb 3 17:47:34 2013 -0800
    Everything happy apparently maybe hopefully
Date:    Sun Feb 3 16:26:18 2013 -0800
    Style, error checking fixes
Date:    Sat Feb 2 22:09:14 2013 -0800
    Finished extraction, finished main functions

    TODO:
    -expand and clean up error checking
    -extra credit function
    -extra credit duplicates
    -make file
    -header file?
    -LaTeX writeup
Date:    Sat Feb 2 21:05:28 2013 -0800
    Add error checking, rebased mistake
Date:    Sat Feb 2 20:12:43 2013 -0800
    Finished "append all" method
Date:    Sat Feb 2 15:36:05 2013 -0800
    Fix for delete func, added more test files
Date:    Sat Feb 2 13:56:24 2013 -0800
    Delete unnecessary function, fix for perms, adding
Date:    Fri Feb 1 22:56:25 2013 -0800
    Remove unnecessary define
Date:    Fri Feb 1 22:41:31 2013 -0800
    Fix for issue involving files starting at odd byte
Date:    Fri Feb 1 22:14:42 2013 -0800
    Added broken ar archive for testing
Date:    Fri Feb 1 22:10:30 2013 -0800
    Append option working (on some ar modes, need test)
Date:    Fri Feb 1 12:32:15 2013 -0800
    Delete function changed, still doesn't work...
Date:    Wed Jan 30 21:35:38 2013 -0800
```

```
        Sketched out file from archive delete logic
Date:    Wed Jan 30 17:19:11 2013 -0800
    Fix formatting issues associated with ar -tv
Date:    Wed Jan 30 08:11:33 2013 -0800
    Structure change (LaTeX template removed)

    Switching to McGrath's makefile based LaTeX approach.
Date:    Tue Jan 29 22:59:08 2013 -0800
    Got complex printing done (minus formatting)
Date:    Mon Jan 28 21:02:19 2013 -0800
    Got basic printing working, no lstat yet.
Date:    Sun Jan 27 19:47:48 2013 -0800
Date:    Sun Jan 27 19:44:29 2013 -0800
    ASSIGNMENT 2: begin work
```
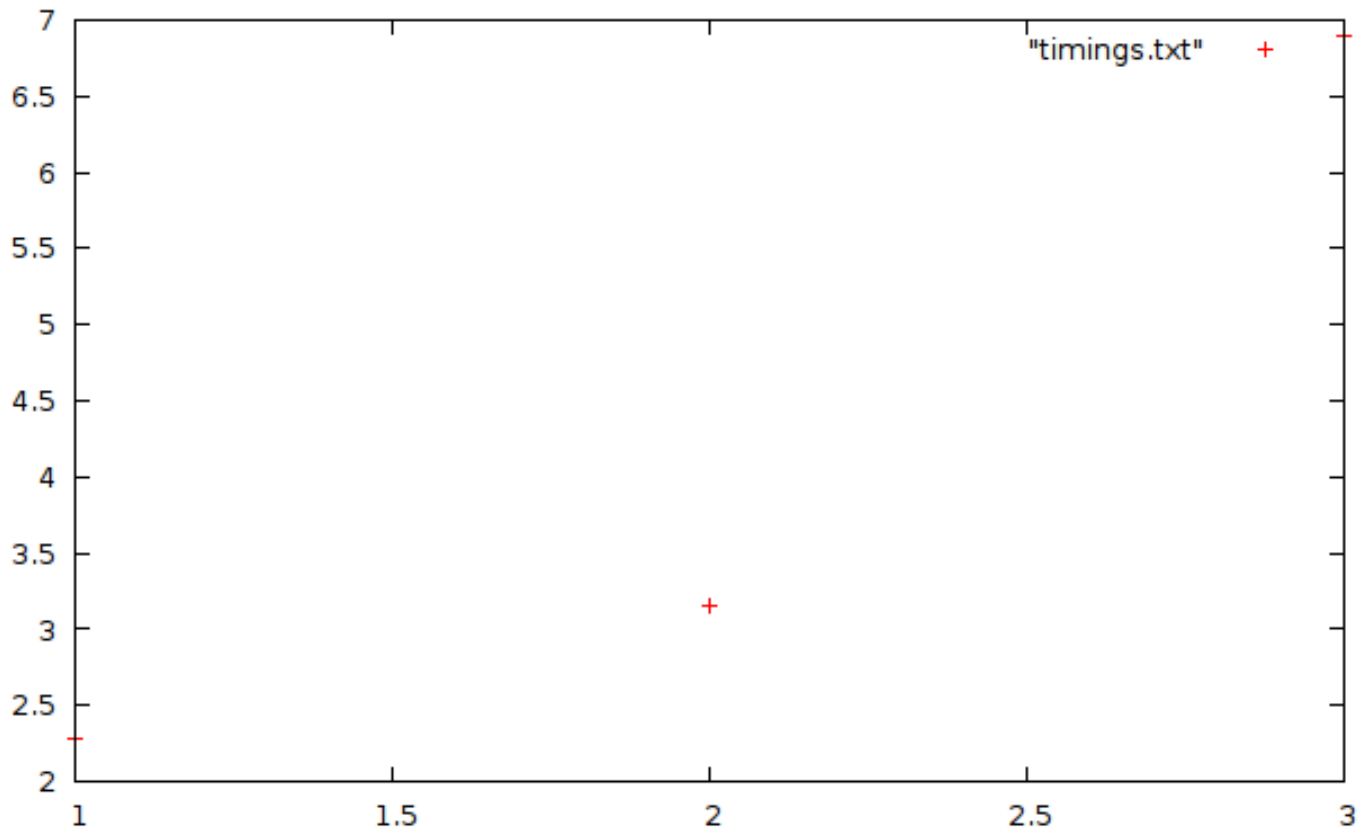
3   Challenges

Biggest challenge was definitely getting the pipes to behave correctly. I also struggled with debugging (using gdb) on multiple processes. Even using the "set follow-fork-mode parent/child" command was still a pain to do.

4   Output

Figure 1: Run times with various file sizes

5   Questions

5.1   Main point of the assignment

Multiple processes (fork()) and pipes specifically. Probably also some general system knowledge, fd manipulation, etc.

5.2   Solution testing

gdb, valgrind. Mostly testing on files from Project Gutenburg with different numbers of processes and checking output. Checked on small input files at first to get an expected output.

5.3   I learned...

How to handle pipes correctly and deal with the issues caused by forking off multiple child processes within a single application.