

# CS311 - FA13: Uniqify

Trevor Bramwell

November 18, 2013

## 1 Design

To implement the given system, I will first setup a 3D array to hold pipes, and use this in each of the processes. After that I will setup the parser to get data, round robin style, into each pipe. I will then fork off N processes, and close all unneeded file descriptors. Each process will then exec sort and return it's input to the pipe. The rest of the program will be merging and suppressing the output from the pipes, and waiting for the sort processes to finish.

### 1.1 Deviation

The first thing I found out as I got going was that a 3D array was too confusing for me to handle. I split it up into two separate arrays for holding the pipes. The second issue I had was setting up the parser before forking the sort processes. I solved this by forking at three points in my program so that the execution would be easy to follow. I did not plan on it, but later decided to refactor the code for readability. This also helped for understanding the program logic, as there was less text to read for each fork.

## 2 Questions

What do you think the main point of this assignment is?

The main point of this assignment was to teach us how to register signals, setup pipes, and handle multiple processes.

How did you ensure your solution was correct? Testing details, for instance. This section should be very thorough.

I tested my solution by first creating a file that held 6 copies of war and peace. I then used this for the basis of my tests, using different numbers of pipes and almost always specifying an output file.

To ensure the output and input streams were correct, I tried all permutations of each. I was satisfied when they all output to the correct places.

What did you learn?

Sometimes the problems you think will be the simplest to solve, are the hardest. When going about the assignment I put off suppressing to the last minute because I thought it would be pretty straight forward. Little did I know it would be what I spent the majority of my time on, and I would still not get it right.

Having a working solution is more important than having a correct solution. Had I ignored the fact that suppression wasn't working correctly, and would take more time than I had, I could have turned this assignment in on time, and not have lost as many points as I probably will.

### 3 Work Log

commit c4da73e65baddb6641d015b3c2b43a1de828d5e6  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Mon Nov 18 22:33:25 2013 -0800

CS311: Switch to ICC.

commit 3df95f1340055efdda168071f12ecbb67d1ce1e7  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Mon Nov 18 22:29:02 2013 -0800

CS311: Clean up signal handling.

If SIG(QUIT|HUP|INT) received, stop all the processes by sending SIGHUP.  
This is because sort will continue to work when receiving SIGQUIT.

commit efa633a0d88164ccc6a9cba0f13a6e0049b7f018  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Mon Nov 18 21:50:04 2013 -0800

Revert "CS311: Ignore signals for now."

This reverts commit d9ef30b1f6fdd2813bf22a9b64de6709c8673fa2.

commit 514b1fd1299ab81c6997ad1b45ac835e620c546a  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Mon Nov 18 21:49:11 2013 -0800

CS311: Only take in alpha character input.

commit d9ef30b1f6fdd2813bf22a9b64de6709c8673fa2  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Mon Nov 18 08:00:56 2013 -0800

CS311: Ignore signals for now.

commit a69b3c74f76c5f08f1b58ae9593b6edd3559a599  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Mon Nov 18 02:35:48 2013 -0800

CS311: Add better suppressor.

commit 2bc9a1229090f09592c1a567e73611aa5d228fe1  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Sun Nov 17 21:53:18 2013 -0800

CS311: Ensure we finish reading words from all pipes.

commit dbaa77f5ea7299c27ee7ee7e645be20572180e50  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Sun Nov 17 15:27:59 2013 -0800

CS311: Add broken suppressing logic.

commit 6311530cc37df4080645279693578710a55f2354  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Thu Nov 14 22:24:40 2013 -0800

CS311: Add signal handling for SIGCHLD.

This is taken directly from The Linux Programming Interface, by Michael Kerrisk.

commit 8e5c848e75bc1b02d393437f15e7bfd8785e232a  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Thu Nov 14 21:11:08 2013 -0800

CS311: Update function headers with TODOs.

commit 116f397422b0c0ad0134f562e37bbfe3910cd5cb  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Thu Nov 14 21:10:34 2013 -0800

CS311: Lets save some memory. Reduce buffer to 64.

commit a398d8be1ba7acf91e21bba7b702448bbc1934f2  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Thu Nov 14 21:00:55 2013 -0800

CS311: Succinctify supervisor.

commit 65048b3a333147c1d1a8900ccb5d5f0f4c37f179  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Thu Nov 14 20:57:28 2013 -0800

CS311: Move sorting to own function.

commit 3b8cee27d1ef872a6bca3cb050e5d6ffcb7b3fef  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Thu Nov 14 20:54:13 2013 -0800

CS311: Move suppressor to own function.

commit cdec3ffac86bf4c751b4b1ef6ebb55f2ad113d95  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Thu Nov 14 20:50:14 2013 -0800

CS311: Move parser out to own function.

commit eb75769fd9b43b59702e91ada113042a4ae1b337  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Thu Nov 14 20:39:08 2013 -0800

CS311: Enabled input/output files.

commit f4344139b3201f370766fe57b037a5ef5718edb4  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Thu Nov 14 00:14:17 2013 -0800

CS311: Setup parser and supressor, RR put and get

commit f1144d6dccc3064eac2e56df38df7682ba490a28  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Wed Nov 13 23:17:13 2013 -0800

CS311: Update pipe closing code for processes.

Accept multiple sort processes creation.

commit 2e7f0040a5d6d24cc6eea0ecf3825b9bd3423874  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Wed Nov 13 22:48:02 2013 -0800

CS311: Setup multiple pipes for sort processes.

Move macros to header file.

commit 5ffb9132b4b7f2db2425c9a2e81c9e71c3e1f640  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Wed Nov 13 08:57:24 2013 -0800

CS311: Fix pipe setup for uniqify.

commit 5fb60638dc36d81a042bcc7c4b2574606c62165a  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Mon Nov 11 09:12:02 2013 -0800

CS311: 3 seperate processes

Setup input and output pipes.  
Add pipe examples from book.  
Add possible test scenarios.

commit 63e32ec7821029a0207278194ab2fbf24592d391  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Sat Nov 9 19:23:55 2013 -0800

CS311: Create 4N pipes, Fork processes, Wait.

commit acc95a2efa04c6d9c01ef66535de7a55d9f9ebd0  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Fri Nov 8 01:07:25 2013 -0800

CS311: Updated examples section.

commit b187a32c21f8a85facd452bec79a4f5e18c633d5  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Wed Nov 6 22:45:39 2013 -0800

CS311: Switch -i option to first argument.

Sets Makefile default to compile uniqify.  
Currently copies argument, or stdin, byte by byte to -o, or stdout.

commit 4028379ee55a4d5ec03fd1e6f708ce87598e2825  
Author: Trevor Bramwell <trevor@bramwell.net>  
Date: Wed Nov 6 01:20:11 2013 -0800

CS311: Assignment 3 - First steps.