

# CS311 Project 4

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## **1 a design for your system, as well as places your implementation deviated from this design**

My initial system design was to create the appropriate number of processes from within the main function, pass words to each process, then merge-sort the outputs of pairs of processes to create the list. I planned to then uniquify and print the list.

I had planned to figure out a way of getting each process to detect when the other end of its pipe was closed. This turned out to be impossible, so I decided to send an EOF instead to signal to a process that it had recieved all the words and should sort them, then reverse the direction of the pipe and give the words back in sorted order.

For my final design, I discovered that it was simpler to create the generic sorter processes from a separate function. I asked about alternate merge sort implementations at Linux Users Group, and heard about a technique where you take the lowest of the next words from each of an arbitrary number of sorters, rather than pairwise merging.

## **2 a work log, detailing what you did when**

During the week of 10/29 to 11/3, I researched the concepts necessary to create the program, and drafted an outline of the code. On 11/4, I created an extremely detailed outline of the code, with the control structures in place and comments detailing the exact functionality of every line. After verifying that the proposed code fulfilled project requirements and was possible based on my research, I implemented and tested it on 11/4 and 11/5.

## **3 any challenges you overcame in completing this assignment**

The main challenge that I faced was being extremely busy with midterms and assignments for other classes. Although starting the serious coding on Sunday rather than Monday is an example of terrible work ethic, it's actually an improvement over my prevoius tactic of not starting the project until Monday.

The technique I used to overcome my fear of the seemingly complex assignment was to break its behavior down into extremely simple pieces before beginning to code. It worked well, and I plan to use it on the next assignment and start sooner.

## **4 answers to the following questions:**

### **4.1 what do you think the main point of this assignment is?**

I think the main point of this assignment is to acquaint us with creating processes and using pipes, so that we're prepared for the next assignment and final project in this class.

### **4.2 how did you ensure your solution was correct?**

I know the exact correctness of my system, inasmuch as I know that it is not correct at all. I know this because it segfaults instead of running.

### **4.3 what did you learn?**

I learned that the development process works immensely better when one compiles the code early and often. At first, I tried to write the entire program and test it afterwards. But I learned that it's much faster and generates much more reliable code to test in the tiniest possible increments, rather than all at once.