Design Document

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1 Goal

The goal of this program is to write a simple shell.

2 Assumptions

The assumptions that I had to make were that I could use the code that was given to us to make a basic shell to perform commands that Unix or Linux can do.

3 Design

Some code was implemented for us. A file called 'shell.l' was written for us to help with parsing arguments passed in. By using the skeleton code given I was able to implement a shell to run Unix commands.

4 Pseudocode

The Pseudocode for the shell program is given below.

Algorithm 1 A simple shell in C

```
while true do
  ask user for input
  initialize a done to 0
  while !done do
    for i 0 to args != null do
      // count the number of arguments
    end for
    // initialize cmd done to 0
    // initialize several variables: status, redirect, cwd, pipe, read, write file descriptors
    for i to args do
      // count the next arguments
    end for
    //compare command line arguments for redirect < and >
    //compare command line arguments for redirect >>
    // check for &
    // check for pipe command
    // check for cd command
    // fork a process
    // check if process is child process:
    if pid == 0 then
      // check file descriptors duplicate any of them for pipe
      // for pipe check both previous and current pipe
      // duplicate file descriptors as necessary
      // execvp() a child process
    end if
    // in parent process
    while wait(& status) != pid do
      // check status of pid
      // close pipes
      // initialize pipes
      // bump up next command index
      // check if arguments are null end loop
    end while
  end while
end while
```