

Programming Assignment (PA) -1

(Shell Command Execution Simulation)

CS 307

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This project is a C program which is a simulation of pipe execution of man and grep commands.

Command

This shell command picked for this program:

```
man df | grep -e -h -A 1 -m 1 > output.txt
```

“df” displays the amount of disk space available on the file system containing each file name argument. “-h” print sizes in powers of 1024 (e.g., 1023M) to ensure readability for user. “-h” is very useful command for “df”. “-e” option use given pattern as the patterns while searching input and then if given pattern matches any of patterns, it select input row. This option is useful because when “-e ”

Used multiple times or combined with -f (--file) option, search for all patterns given. “-e” option ensure protection against patternn beginning with “-”. “-A *number*” option prints number of trailing line of context after each match. The option “-m *number*” option stops after number matches. “> outp.txt” writes the output to the given file.

Program Implementation

In c file, “Shell” process begins and print its pid to the console. Then Two child processes were created “Man” and “Grep” processes.

The file descriptor defined as “fd [2]” to piping the “Man” and “Grep” processes. After that fork () function is used and pid of the process “Man” defined as id1, thus “Man” process has started. After that After that id2 is defined with fork () for “Grep” child process.

The grep process execute dup2() and execlp () functions.

If this process created, process print pid of subprocess to the console. Finally, output file (output.txt) is created, results of the “Grep” process is printed to output.txt. Shell waits until both child process finish, and then end program with ending output. (I’m SHELL

process, with pid – execution is completed, you can find the results in output.txt.)