Ali Cenker Yakışır PA1 Report

This is an explanation of Shell simulation in C named as alicenker_PA1.c

This file replicates the shell command in Ubuntu OS (22.04). The command which is executed is written in the file named as command.txt. the command is *man grep | grep "-c," -A 2*

Command

The reason this command chosen is that in the lectures, grep with -c argument is used a lot in the examples. And it always returned a number. I did not understand that in the first time so, it would be great to investigate manual of the grep. Yet since grep command also used with many arguments like regular expressions, etc. it has lots of descriptions. Therefore, specifying what am I looking for exactly would be much faster instead of scrolling. So, I have looked for the "-c,".

Since '-' is used for the special arguments. I have passed the "-c," to execvp() function with backslash in front of the '-'. Also '\' is a special character for string, I have used another backslash front of it (strdup("\\-c,")).

Also, I used it with -A 2 argument. This argument will give us the consecutive 2 lines when "-c," is seen.

Process hierarchy

There is a process hierarchy in this program. The main process replicates the Shell. it does the regulations such as opening output file and creating a new file descriptors which are fd[0] and fd[1]. Most importantly, newly created fd is piped with the pipe() command. It will be used to interprocess communication.

First fork() operation will create the man process which is the child of the Bash. This process executes the man grep command with execvp() function. Since after the execvp(), we cannot be able to write any code after it so, Fork() will be done before the execvp(). This fork() will create the grep process, which is the child of the man process, simulates grep command.

Man and grep processes are communicating with pipe channel. These processes are working at the same time. Man writes to pipe and grep reads from the pipe simultaneously. greps output is directed to file instead of the console.

Output

   Output of the grep process is in the file named as output.txt. This file will be created in the C program so that program needs to be compiled and executed.