CS 307 OPERATING SYSTEMS
PROGRAMMING ASSIGNMENT – 1
REPORT

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1. Introduction

This report is prepared for Sabanci University CS307 Operating Systems course Programming Assignment 1, to give details about chosen command and its option, along with the process hierarchy implemented in C code.

2. Command & Option

For this programming assignment, the command that was chosen to be explained by the man command is “ls” (list) and the option chosen for this command is “-R”.

a. What are they for?

Command ls is short for “list”, and it basically lists directory contents.[1] When used with option “-R”, which stands for “recursive”, it lists subdirectories recursively.[1] To be more specific, it doesn’t just list the subdirectories of the current directory but also continues with what is inside these subdirectories and prints them to the console in an ordered manner. As the name suggests, it recursively displays subdirectories until there is no more subdirectory to get into.

b. Why have I chosen them?

What they are doing may seem very basic, they are just listing directory content. However, not many of us remember where they put all their files with exact paths. Personally, before learning about this option, to be able to write the path for a specific directory, I was checking the directories manually via GUI. With this option, even if I recall roughly which higher-level directory the folder, I am looking for is in, I can find the path to it readily and only on Shell, without GUI. This fundamental command and option help me with saving time in this sense.

[1]https://man7.org/linux/man-pages/man1/ls.1.html

3. Process Hierarchy

The process hierarchy of the program starts with the process that will correspond to the shell, namely the “parent” process. This parent process, shell, then forks to have the “child” process. This child process is corresponding to the grep command execution. Finally, the child process forks to have the “grandchild” process, which is corresponding to the man command execution. The reason behind this hierarchy is that in this way, grep can wait for the man to terminate (child waits for grandchild process) and shell can wait for grep to terminate (parent process waits for child process). In other words, we can be sure that piped commands finish their execution in order. It also prevents the shell bug that we have seen in the lectures.

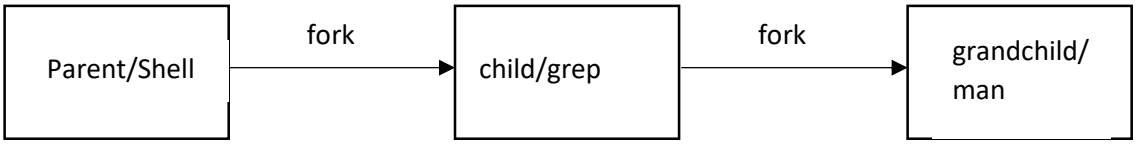

Figure 1. Process Hierarchy