

CS/SE 4348: Operating Systems

Programming Assignment 1

Instructor: Ravi Prakash

Assigned on: June 7, 2022

Due date and time: June 17, 2022; 11:59 pm

This is an individual project. Sharing of code is strictly prohibited and will be dealt with as per the university's rules governing academic misconduct. You are expected to demonstrate the operation of your project to the instructor or the TA. You can download the prepared Linux Virtual Machine from <http://www.os-book.com/> for this project. Your code should be in **C, C++ or Java**.

In this project, you will use ordinary pipes to implement an inter-process communication scheme for message passing between processes. Assume there are two directories, *d1* and *d2*, and there are different files in each one of them. the names of files in *d1* are different from the names of files in *d2*. Each file contains a short-length string of characters. You have to use a parent process that forks two children processes, and have each child process check one of the directories.

- Assume that child 1 (child 2) is responsible to check the directory *d1* (directory *d2*, respectively). This child process has to create a list of names of the files in the directory and be able to open and read the contents of the files.
- After creating the list, each child process will send its list to the other child process using a pipe.
- Upon receiving the list, child 2 (child 1) will create the files listed by child 1 (child 2) in directory *d2* (directory *d1*, respectively);
- Each child process will send to the other child process, using pipes, the contents of the files in its directory. The receiving child should populate the files with their corresponding received contents.

After these steps, the directories *d1* and *d2* should be identical in terms of the list of files, and the contents of the files. In your code you should not make any assumption about the size of files.

Submission Information

The submission should be through eLearning in the form of an archive consisting of:

1. File(s) containing the source code.
2. The makefile.
3. The directories and files you used to test the execution of your code.

Please do “make clean” before submitting the contents of your directory. This will remove the executable and object code that is not needed for submission.

Your source code must have the following, otherwise you will lose points:

1. Proper comments indicating what is being done
2. Error checking for all function and system calls