Operating Systems
CSC 341/641

Program 1

Shell

Part A:
Write a C (NOT C++) program that will act as a shell command line interpreter for the Linux kernel. Your shell program should use the same style as the Bourne shell for running programs. In particular, when the user types a line such as:

```
identifier  [identifies [identifier] ]
```

your shell should parse the command line to build `argv`. It should search the directory system (in the order specified by the PATH environment variable) for a file with the same name as the first identifier (which may be a relative files name or a full pathname). If the file is found, then it should be executed with the optional parameter list, as is done with `sh`. You can use any variation of the `exec` command.

Part B:
Add functionality to the shell so that a user can use the "&" operator as a command terminator. A command terminated with "&" should be executed concurrently with the shell rather than the shell waiting for the command to terminate before it prompts the user for another command,

Part C:
Modify your shell program so that the user can redirect the `stdin` and/or `stdout` file descriptors by using the "<" and ">" characters as filename prefixes. Also allow the users to use the pipe operator, "|", to execute two processes concurrently, with `stdout` from the first process being redirected as the `stdin` for the second process.