Course COMP-8567
Assignment 03
Summer 2023
Due Date: Jun/19/2023
50 Marks

Write a C program **shell23s** (**mshell$**) that goes into an infinite loop waiting for user's commands. Once a command is entered, the program should assemble and execute each command using fork(), exec() and other system calls as required with the following rules and conditions.

Rule 1: The argc of any individual command or program should be >=1 and < =5

- **mshell$ ls -1 ~/chapter2 -S -n //valid**
- **mshell$ cat new.txt //valid**

Rule 2: The argc of induvial commands or programs that are used along with the special characters listed below should be >=1 and <=5

- Ex: **mshell$ ls -1 ~/chapter2 -S -n | wc -w** //the first command has argc=5 and the second command has argc=2 which are used along with the special | character

Special Characters

The program should handle the following special characters (In accordance to Rule 2 and the additional rules listed below)

- | **Piping** (up to 7 piping operations should be supported)

  Ex mshell$ cat ex1.c|grep std|wc| wc -w

  // Every command/program can have argc >=1 and <=5 as per Rule 2
- >, <, >> **Redirection**

  Ex: mshell$ ls -1 >>dislist.txt
- && **Conditional Execution** // upto 7 conditional execution operators should be supported and could possibly be a combination of && and ||

Ex : mshell$ ex1 && ex2 && ex3 && ex4 && ex5

- **mshell$ c1 && c2 || c3 && c4**

- || **Conditional Execution** // see &&
- & **Background Processing**
  - **mshell$ ex1 &** //should run ex1 in the background
- ; **Sequential execution** of commands (up to 7 commands) the argc of each command should be >=1 and <=5 as per Rule 1

  Ex: mshell$ cat e1.txt; cat e2.txt ; ls ; date

Note:

- **You must include comments throughout the program reasonably explaining the working of the code.**
- You have to use **fork() and exec() along with other pertinent system calls** to run commands from minishell
- Appropriate **error messages** must be displayed by the program based on the specifications.

Submission Instructions:

You need to submit the following:

1. shell23s.c
2. shell23s.txt //note: shell23s.txt must be an identical copy of shell23s.c with a .txt extension
3. Zoom/Google Drive recording link explaining the following (not more than 15 minutes)
   - Overall working of the code and various modules (around 8-9 minutes)
   - Execution of the code under various inputs/conditions as per the requirements of the assignment (around 6-7 minutes)
   - Other form of links/MP4 files will NOT be acceptable.
   - Include the link in the COMMENTS section.

Note:

- You are required to follow the Submission Instructions carefully and email the instructor reasonably ahead of the submission deadline in case of any questions.
- Incorrect submission of files/purported inadvertent submission of empty

files, or absence of any file/link/requirement as outlined in the submission Instructions will be deemed as a missed assignment and will be assigned a mark of zero.

- After your submission, you will be able to view the **Turnitin similarity report** that compares your submission with all the remaining submissions in the section/all the sections of the course.