Birla Institute of Technology & Science, Pilani, Hyderabad Campus

Programming Assignment-1

Operating System (CS F372)

Summer-Term 2019-2020

(Total Marks 2*5= 10 Marks)

Students are required to do this assignment in groups of 2 students. Form groups among yourselves. **The deadline for this assignment is June, 11, 2020.** There are 2 questions totally in this assignment and each carries 5 marks. The goal of this programming assignment is to get every student to understand and implement the functionality of shell and interprocess communication. Each of the questions are provided below:

1. **Shell:** Write a C program to implement the command line shell that does the following:
   - A prompt should be displayed upon starting the execution of a program and it should allow the user to type basic commands one after the other. The program must support at least any 6 commands such as **ls, cd, mkdir, rmdir, rm, cp, mv, etc.**
   - For each of the user's commands entered, a separate child process should be created to execute the command and display the output if any.

   Note: Execution should be terminated only when the user types the command **exit** on prompt.

2. **Interprocess Communication**
   a) Design a file-copying program named filecopy using ordinary pipes. This program will be passed two parameters: the name of the file to be copied and the name of the copied file. The program will then create an ordinary pipe and write the contents of the file to be copied to the pipe. The child process will read this file from the pipe and write it to the destination file. For example, if we invoke the program as follows:

   filecopy input.txt copy.txt

   the file input.txt will be written to the pipe. The child process will read the contents of this file and write it to the destination file copy.txt. You may write this program using either UNIX or Windows pipes.

   b) Write two programs, i.e., Program1.c, and Program2.c that communicate with each other through a shared memory. Both the programs must be run indefinitely. For each line of the input (e.g., a sequence of alphanumeric strings) entered for program 1, program2 should display the number of vowels, consonants, words and numerical digits of the input.

Submission Instructions:

- Create one main folder that contains two sub folders, which represent the source code of above two questions respectively. Each of the sub folders should contain the source code of the questions, one MS word document capturing the screenshots of the output and the observation if any. Each subfolder should also contain a read file specifying instructions to compile and run and shall also specify which program to be run first in order to see the expected output from your programs.
- The main folder must contain **one main word file** that should include the group information, i.e., **student name, roll no and email id of each student.**
- Zip the main folder and upload the zip file either on CMS or mail me by **June 11, 2020 23.59 pm**

Demonstrations:

You will be required to give the demonstration of this assignment online. Each member of the group is required to be presented at the time of demonstration and will be evaluated individually.

Note:

- Plagiarism software would be used to check the similarity scores. If a higher match is found between the submissions of two or more groups, they will be awarded a grade penalty accordingly.
- The submission link for uploading zip file on CMS would be enabled soon for Hyderabad campus students and the students of both Pilani and Goa campus students can mail the zip file.

You can drop me a mail for any other queries in this regard or you can also post your query on Piazza as well.