BCSE – 3rd year – 1st Semester – 2019
Assignment – I
Operating Systems Laboratory

1. Write a shell script that has 2 user created variables, userv1 and userv2. Ask for the values of the variables from the user and take in any type (real/integer/character) for the 2 variables.
   Try to perform the following operations on the variables: (a) add, (b) multiply and (c) division. Print appropriate error message/s if the operation cannot be performed, otherwise print the result appropriately: like, "the sum of 'userv1' and 'userv2' is ….". Execute the shell script as many number of times the user wants. Show all possible combinations of the types of variables and result/s of the corresponding operation/s.
2. Write a shell script that counts and prints the total number of files in current working directory and in all of its sub-directories. Also (i) print total no. of files (not directories) in each subdirectory with the name of the subdirectory, (ii) print only those file names that have been created within the past 2 days.
3. Write a shell script that counts the number of disk blocks occupied by a file (the file name is passed as an argument and the file may be assumed to be in the current directory).
4. Write a shell script that takes 4 file names (C programs) as command line arguments and prints the frequency of the occurrences of the following 3 strings "printf", "scanf", "int" in each file. The output (in tabular format) should clearly denote the frequency of the occurrences of each string in each file.
5. Write a shell script that accepts a file name as an input. The program then asks for a string of characters (that is, any word) to be provided by the user. The file will be searched to find whether it contains the given word. (i) If the file contains the given word, the program will display the total number of occurrences of the word. (ii) The program is also required to display the line number/s in which the word has occurred as well the frequency of the word in that line. (Note: the word may occur multiple times in a given line). (iii) If the file does not contain the word, an appropriate message will be displayed.
6. Extend the shell script written in question (5) to perform the following task: User is asked to enter another word. (i) The first word (entered in question (5)) will have to be matched with the contents of the file and replaced by the second word, if a match occurs, (ii) Ignore replacing Partial matches, but show that partial matches do exist.
7. Develop a Linux shell *BCSEIII-2019*, that will display a prompt, accept user commands and execute.

The overview of the functions of *BCSEIII-2019* is as follows:

- At startup, the shell will display the prompt string: BCSE!!, and ready to accept command.
- A command line has the following syntax: command [argument/s]
- When a valid command is entered by the user, the shell will execute the command. Commands may run in the foreground as well as in the background.
- The shell will return an appropriate error message when the command is invalid, or when there are problems with either the arguments or the execution of the command.

The commands to be executed by *BCSEIII-2019* are given below:

(i) **dirnew** *directoryname* <action: creates a new directory>

(ii) **editfile** [*filename*] ([] denotes that the argument is optional)
<action : the file will be opened with the vi editor if filename is given otherwise
the vi editor for a new file will be opened.>

(iii) **info** [*filename*] ([] denotes that the argument is optional)

action: displays essential information about the file specified, it must list the following:

- full path of the file, size of the file, last modification date, name of the creator

(iv) **exitnewshell** <action: this will quit the shell>

Last Date for submission and viva: September 09/10, 2019 (all groups)