Assignment 4

OPERATING SYSTEMS, SPRING 2020

Instructions: Do not copy material from other sources, if it is necessary, then provide the references. Plagiarized assignment will get negative marks, and can be called for DC action.

***NOTE:** You may submit this assignment in groups of 2 persons each.*

DEADLINE: 11.55 PM of 26th May, 2020.

You have to implement your own file systems. The first time your utility will runs, it will ask user following arguments

- Block size of the virtual hard drive you will create
- Name of the file which will be treated as the new virtual hard drive
- Path of a directory which you will import as a root file system into your virtual hard drive

In the subsequent runs, if the virtual hard drive should already be present in the same directory, your utility should not ask any of the above things.
In the virtual hard drive there will be two portions

- Volume Control block which will store the directory tree along with the FCBs. It will also have the FAT table to keep track of the data and free space
- All other blocks will be treated as Data blocks. Number of data blocks should be 1000 regardless of the size of the block.

You need to implement following five commands

- **ls** lists the contents of a directory
- **rm** removes a directory or a path
- **mkdir** creates a directory
- **cd** changes the present working directory
- **import** imports a file from the host system to the path specified in the arguments.

Directory tree and FCBs can be implemented using JSON (you may have to search on how this can be done). In the JSON there will be three types of keys:

- **Keys with no value:** they will represent empty directories
- **Keys with dictionary value:** they will represent directories containing one or more directories or files

- **Keys with integer value:** they will represent a file control block, integer being the starting data block number.

Submission: The submission should contain only following things. If there is one missing then the assignment will be given 0 marks. Additional things will also be penalized.

1. `Assign-4.cpp` the code of the assignment
2. `Makefile` which makes executing make command in the respective directory compile the code into an executable.

After executing make an executable should be created named `assign-4.o`. Executing that executable should generate all the respective output files.

For more help and clarification, contact the TA.
Email TA: Muhammad Abdullah Aziz: l164085@lhr.nu.edu.pk

Submission platform:

As per the updated university policy, you have to submit this assignment via **SLATE**. However, in case SLATE is temporarily down, you may submit it via google classroom in case of last-minute submission. Submission via both platforms will be available. Default submission platform however, is SLATE.