Course COMP-8567
Assignment 01
Fall 2023
Due Date: Oct/11/2023

Write a C program **dircpmvlist** that **copies or moves** a directory tree rooted at a specific path in the home directory to a specific destination folder in the home directory **along** the file types specified in the extension list (or the entire directory if the extension list is not specified)

Synopsis :

dircpmvlist [*source_dir*] [*destination_dir*] [*options*] <extension list>

- Both *source_dir* and *destination_dir* can be either absolute or relative paths but **must belong** to the home directory hierarchy.
- If the *destination_dir* is not present in the home directory hierarchy, it should be newly created.

- ***options***
  - **-cp** copy the directory rooted at source_dir to destination_dir and do not delete the directory (and contents) rooted at *source_dir*
  - **-mv** move the directory rooted at source_dir to *destination_dir* and delete the directory (and contents) rooted at *source_dir*

- **extension list:** up to 6 file extensions can be provided (c , pdf, txt etc.)

  - **If the extension list is provided with -cp**:
    - The entire sub-tree rooted at *source_dir* along with all its folders/sub-folders and the corresponding file types (only) listed in the extension list must be copied onto the *destination_dir*.
    - All the folders/sub-folders/files must be copied onto *destination_dir* as per the original hierarchy at *source_dir*.
    - File types not listed in the extension list must not be copied to the *destination dir*
    - If *desintation_dir* does not exist, it must be created.

  - **If the extension list is provided with -mv**:
    - The entire sub-tree rooted at *source_dir* along with all its folders/sub-folders and the corresponding file types (only) listed in the extension list must be copied onto the *destination_dir*.

- All the folders/sub-folders/files must be copied onto *destination_dir* as per the original hierarchy at *source_dir*.
- File types not listed in the extension list must not be copied to the *destination dir*
- If *desintation_dir* does not exist, it must be created.
- The original subtree rooted at *source_dir* **must be deleted** entirely along with its folders/sub-folders/files (All files) etc.

- **If the extension list is not provided**, all files and folders must be copied or moved as per the option chosen. (Very Important!!)

Sample Runs

- $ dircpmvlist ./folder1 ./folder2/folder3 -cp txt pdf
  - This will copy the directory tree rooted at ./folder1 to ./folder2/folder3 as per the *source_dir* hierarchy and will **copy only** the .txt and .pdf files (as per the original hierarchy)
- $ dircpmvlist ~/folder1 ~/folder3 -mv
  - This will move the entire directory tree rooted at ~/folder1 to ~/folder 3 along with all the files and folders as per the *source_dir* hierarchy

If the source directory does not exist or does not belong to the home directory hierarchy, an appropriate error message must be displayed.

Additional Requirements and Submission Instructions

You must use the **system call nftw()** that allows you to traverse a file tree. This system call will recursively visit all the files/directories present in the tree and will call you own function (a function that you pass as a parameter).

You need to read the manual of nftw() before you start working on your assignment.

Comments and explanation of the program

- You are required to include adequate and appropriate comments to explain the working of the program.
- Please see the assignment rubrics for more information

Submission Instructions:
You are required to submit the following:
1. dircpmvlist.c
2. dircpmvlist.txt //note: dircpmvlist.txt must be an identical copy of dircpmvlist.c with a .txt extension
3. Zoom/Google Drive recording link explaining the following (10-15 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 forms of links/MP4 files will NOT be acceptable.
    - Include the link in the COMMENTS section.

Please 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.
- 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.