ADVANCED OPERATING SYSTEM

ASSIGNMENT -1

To read a given directory and print the following information for all files/sub-directories :

-owner

-filetype

-access permissions

-access time

It should be able to handle symbolic links and loops formed if any;

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INPUT: Path of the directory to be traversed

OUTPUT: All the files and sub-directories information present in the directory given in input;

Approach: Given a directory it will return a dirent structure using opendir() command.the readdir() command will return directory entries one by one,which will be proccessed one-by-one depending upon the file type i.e, directory/file/ symbolic links via the defined function ProcessingEntity().Any loop formed via symbolic links is handled by maintaining a vector of i-nodes. Whenever a file/directory is processed it's i-node is saved in the vectors and compared whenever a symbolic link is traversed so as to catch any loop in the directory.

USER-DEFINED FUNCTIONS:

1)void ProcessDirectory(char *): Process the entire directory. Takes pointer to the character array as input. Return type: void

2)void ProcessEntity(struct dirent *):Process any entity that is present in directory. Takes pointer to the directory structure. Return type: void

3)int CheckEntityType(struct dirent *):To check whether the entity is file/directory/symbolic links. Takes pointer to the directory as input. Return type: integer,0 for file/1 for directory/2 for symbolic link.

4)string getpermission(char * filename):get access permissions. Takes pointer to char as input. Returns string of permissions .

5)bool CheckProcessingInode(long int): check if i-node is present. Takes long integer of i-node as input. Returns true if present else false.

Let us say we have a directory named A .Within A we have sub directories B and C and files as file1,file2.Within B we have sub-directory D and file file3. Within C we have symbolic link of directory D named as D'. Within D we have files named file4 and file 5. The directory structure will look like: At D' it should represent a symbolic link and a loop exists at D. Contents of A will be printed followed by contents of B and contents of C. While printing contents of C it encounters a symbolic link and hence should indicate the presence of loop I any, which in this case is at D.