CIS3110 Operating Systems Winter 2021

Assignment 4: File System Reports

This assignment asks you to generate reports (to STDOUT) about the file system that display information about the files and directories that appear in a directory that you have supplied to your program as a command line argument.

Your program will be called FSreport and will take 2 arguments:

- First argument is the type of report to be generated
    - -tree for tree directory structure format
    - -inode for inode format
- Second argument is the full path name of the root directory (where the descriptions will start)

Example: $ ./FSreport -tree /home/myname/rootDir

You will use the **fstat** or **stat** command to retrieve information about the files and **opendir** and other related functions for information about directories.

Your report can have 2 forms:

Tree directory structure (-tree)

- Sorted alphabetically by file/directory name
- For each file/directory display the following:
    - Line 1: owner name (group name), inode number, permissions, size in bytes, file/directory name
    - Line 2: Date of last access, Date of last modification (to data or status whichever is most recent)
- Each sub-directory in the file systems tree structure (starting with the given root directory) should be explored.
    - Indicate in your README if you can only report on the files/directories in the root directory (one level only) or if you can display multiple sub-directory levels (indicate the number of levels or the fact that your code can handle any number of levels).

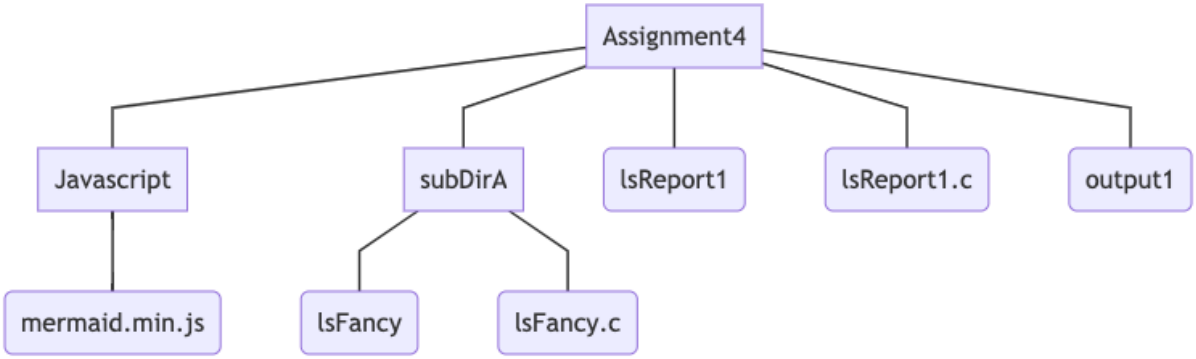
An example of this type of report is in Example A.

Inodes Format (-inode)

- Sorted by inode number – smallest to largest
- For each file/directory display the following:
    - Inode number: size (in bytes), number of 512-byte blocks allocated to the file, file size/512, file/directory name

An example of this type of report is in Example B.

The following examples are reporting on the directory structure in the following diagram:



Level 1 is Assignment4 (you would have specified its entire pathname as a command line argument.
Level 2 are the contents of the sub-directories Javascript and subDirA.

Example A: Tree Directory Structure Report

File System Report: Tree Directory Structure

Level 1: /home/faculty/dastacey/CIS3110/Winter2021/Assignment4
Directories
dastacey (faculty) 38412 drwxr-xr-x 3 Javascript
Sun Mar 14 11:39:28 2021 Sun Mar 14 14:24:39 2021
dastacey (faculty) 38333 drwxr-xr-x 4 subDirA
Sun Mar 14 11:22:23 2021 Sun Mar 14 11:22:48 2021

Files
dastacey (faculty) 38712 -rw-r--r-- 4642 lsReport1.c
Sun Mar 14 15:08:31 2021 Sun Mar 14 15:08:31 2021
dastacey (faculty) 38714 -rwxr-xr-x 17416 lsReport1
Sun Mar 14 15:08:33 2021 Sun Mar 14 15:08:33 2021
dastacey (faculty) 38591 -rw-rw-rw- 0 output1
Sun Mar 14 14:30:39 2021 Sun Mar 14 15:09:03 2021

Level 2: Javascript
Files
dastacey (faculty) 38565 -rw-r--r-- 757704 mermaid.min.js
Sun Mar 14 14:20:40 2021 Sun Mar 14 14:24:09 2021

Level 2: subDirA
Files

dastacey (faculty) 38230 -rwxr-xr-x 16872 lsFancy
    Tue Mar 9 14:15:00 2021 Tue Mar 9 14:15:00 2021
dastacey (faculty) 38446 -rw-r--r-- 2944 lsFancy.c
    Sun Mar 14 12:56:57 2021 Sun Mar 14 12:56:57 2021

Level Formatting:
Level x: Directory name (if this is Level 1 then put the full path name otherwise just the directory name)
Directories (this header does not appear if there are no sub-directories)
...directories
Files (this header does not appear if there are no files)
...files

Example B: Inode Format Report

File System Report: Inodes

Level 1 Inodes: /home/faculty/dastacey/CIS3110/Winter2021/Assignment4

38333:	4	1	17	subDirA
38412:	3	1	17	Javascript
38591:	1248	3	9	output1
38859:	5175	11	9	lsReport1.c
38861:	17416	35	17	lsReport1

Level 2 Inodes: subDirA

38230:	16872	33	17	lsFancy
38446:	2944	6	9	lsFancy.c

Level 2 Inodes: Javascript

38565:	757704	1480	841	mermaid.min.js

Note: the separator between columns is a tab (\t).