

Test Case #1: /home

Testing the program on /home directory

```
derek@derek-VirtualBox: ~/OS/PSET #2$ ./fileChecker /home
Symlink (/home/derek/.mozilla/firefox/ewl9as96.default-release-1601000734695/lock) did not resolve
to a valid target.
Error: No such file or directory
Symlink (/home/derek/Downloads/usr/lib/kde4/kcm_adobe_flash_player.so) did not resolve to a valid
target.
Error: No such file or directory
# of block device inodes:                0.
# of character device inodes:            0.
# of directory inodes:                   210.
# of FIFO/pipe inodes:                   0.
# of symlink inodes:                     3.
# of regular file inodes:                 1325.
# of sock inodes:                        0.
Total size of all regular files:          112521553.
Total disk blocks allocated:              28165.
# of inodes with nlink > 1:               1.
# of invalid symlinks:                    2.
# of directory entries with problematic names: 12.
derek@derek-VirtualBox: ~/OS/PSET #2$
```

Figure 1: Reported results from running:
./fileChecker /home

Test Case #2: Root Directory

Testing the program on the root directory. Many errors were reported.

```
Error: No such file or directory
# of block device inodes:                0.
# of character device inodes:            0.
# of directory inodes:                   31036.
# of FIFO/pipe inodes:                   0.
# of symlink inodes:                     28513.
# of regular file inodes:                 155905.
# of sock inodes:                        0.
Total size of all regular files:          8810550701.
Total disk blocks allocated:              2233307.
# of inodes with nlink > 1:               14.
# of invalid symlinks:                    11495.
# of directory entries with problematic names: 159.
derek@derek-VirtualBox: ~/OS/PSET #2$
```

Figure 2: Reported results from running:
./fileChecker /

```

Symlink (/usr/share/help/eu/eog/license.page) did not resolve to a valid target.
Error: No such file or directory
Symlink (/usr/share/help/eu/eog/plugin-python-console.page) did not resolve to a valid target.
Error: No such file or directory
Symlink (/usr/share/help/eu/eog/plugin-picasa.page) did not resolve to a valid target.
Error: No such file or directory
Symlink (/usr/share/help/eu/eog/plugin-exif-digital.page) did not resolve to a valid target.
Error: No such file or directory
Symlink (/usr/share/help/eu/eog/plugin-rename-multiple.page) did not resolve to a valid target.
Error: No such file or directory
Symlink (/usr/share/help/eu/eog/shortcuts.page) did not resolve to a valid target.
Error: No such file or directory
Symlink (/usr/share/help/eu/eog/plugin-fullscreen-double-click.page) did not resolve to a valid target.
Error: No such file or directory
Symlink (/usr/share/help/eu/eog/plugin-send-by-mail.page) did not resolve to a valid target.
Error: No such file or directory

```

Figure 3: Example of errors from running:
./fileChecker /

Test Case #3: /dev

Testing the program on /dev directory. This directory contains block and character device inodes.

```

derek@derek-VirtualBox:~/OS/PSET #2$ ./fileChecker /dev
Attempting to access an inode (/dev/..) in a different volume.
Attempting to access an inode (/dev/hugepages) in a different volume.
Attempting to access an inode (/dev/mqueue) in a different volume.
Attempting to access an inode (/dev/shm) in a different volume.
Attempting to access an inode (/dev/pts) in a different volume.
# of block device inodes:                22.
# of character device inodes:            190.
# of directory inodes:                   25.
# of FIFO/pipe inodes:                   0.
# of symlink inodes:                     235.
# of regular file inodes:                 0.
# of sock inodes:                        0.
Total size of all regular files:          0.
Total disk blocks allocated:              0.
# of inodes with nlink > 1:              0.
# of invalid symlinks:                   0.
# of directory entries with problematic names: 0.
derek@derek-VirtualBox:~/OS/PSET #2$

```

Figure 4: Reported errors and results from running:
./fileChecker /dev

Test Case #4: No arguments

Testing the program when given no arguments.

```
derek@derek-VirtualBox:~/OS/PSET #2$ ./fileChecker
Usage: ./fileChecker <pathname>
```

Figure 5: Reported error from running:
./fileChecker

Test Case #5: Invalid path

Testing the program when given an invalid path.

```
derek@derek-VirtualBox:~/OS/PSET #2$ ./fileChecker ./nothing
Warning: Cannot open directory ./nothing for reading: No such file or directory
# of block device inodes: 0.
# of character device inodes: 0.
# of directory inodes: 0.
# of FIFO/pipe inodes: 0.
# of symlink inodes: 0.
# of regular file inodes: 0.
# of sock inodes: 0.
Total size of all regular files: 0.
Total disk blocks allocated: 0.
# of inodes with nlink > 1: 0.
# of invalid symlinks: 0.
# of directory entries with problematic names: 0.
```

Figure 6: Reported error and results from running:
./fileChecker ./nothing

Test Case #6: Looped Symlinks

Testing the program on a directory with looped symlinks.

```
derek@derek-VirtualBox:~/OS/PSET #2$ ln -s a b
derek@derek-VirtualBox:~/OS/PSET #2$ ln -s b a
derek@derek-VirtualBox:~/OS/PSET #2$ ls
a b fileChecker fileChecker.c Group testMulti
derek@derek-VirtualBox:~/OS/PSET #2$ ./fileChecker ./
Symlink (./b) did not resolve to a valid target.
Error: Too many levels of symbolic links
Symlink (./a) did not resolve to a valid target.
Error: Too many levels of symbolic links
# of block device inodes: 0.
# of character device inodes: 0.
# of directory inodes: 2.
# of FIFO/pipe inodes: 0.
# of symlink inodes: 2.
# of regular file inodes: 4.
# of sock inodes: 0.
Total size of all regular files: 20860.
Total disk blocks allocated: 8.
# of inodes with nlink > 1: 1.
# of invalid symlinks: 2.
# of directory entries with problematic names: 0.
```

Figure 7: Reported error and results from running:
./fileChecker ./

Test Case #7: Valid Symlink

Testing the program on a directory with a valid symlink.

```
derek@derek-VirtualBox:~/OS/PSET #2$ ls
fileChecker  fileChecker.c  Group  testMulti
derek@derek-VirtualBox:~/OS/PSET #2$ ln -s Group a
derek@derek-VirtualBox:~/OS/PSET #2$ ls
a  fileChecker  fileChecker.c  Group  testMulti
derek@derek-VirtualBox:~/OS/PSET #2$ ./fileChecker ./
# of block device inodes:          0.
# of character device inodes:      0.
# of directory inodes:             2.
# of FIFO/pipe inodes:             0.
# of symlink inodes:               1.
# of regular file inodes:          4.
# of sock inodes:                  0.
Total size of all regular files:    20860.
Total disk blocks allocated:        8.
# of inodes with nlink > 1:        1.
# of invalid symlinks:              0.
# of directory entries with problematic names: 0.
```

Figure 8: Reported results from running:
./fileChecker ./

Test Case #8: /proc

Testing the program on /proc directory. This contains the enormous fake file.

```
# of block device inodes: 0.
# of character device inodes: 0.
# of directory inodes: 6110.
# of FIFO/pipe inodes: 0.
# of symlink inodes: 24744.
# of regular file inodes: 68243.
# of sock inodes: 0.
Total size of all regular files: 140737477888768.
Total disk blocks allocated: 0.
# of inodes with nlink > 1: 0.
# of invalid symlinks: 17106.
# of directory entries with problematic names: 0.
```

Figure 9: Reported results from running:
./fileChecker /proc

```
Symlink (/proc/4043/task/4043/exe) did not resolve to a valid target.
Error: Permission denied
Warning: Cannot open directory /proc/4043/fd for reading: Permission denied
Warning: Cannot open directory /proc/4043/map_files for reading: Permission denied
Warning: Cannot open directory /proc/4043/fdinfo for reading: Permission denied
Warning: Cannot open directory /proc/4043/ns for reading: Permission denied
Symlink (/proc/4043/cwd) did not resolve to a valid target.
Error: Permission denied
Symlink (/proc/4043/root) did not resolve to a valid target.
Error: Permission denied
Symlink (/proc/4043/exe) did not resolve to a valid target.
Error: Permission denied
Symlink (/proc/4069/map_files/5591fdb92000-5591fdb94000) did not resolve to a valid target.
Error: Operation not permitted
Symlink (/proc/4069/map_files/5591fdd93000-5591fdd94000) did not resolve to a valid target.
Error: Operation not permitted
```

Figure 10: Example of errors from running:
./fileChecker /proc

Test Case #9: Multiple hard links

Testing the program on a directory with a file with multiple hard links. It is only counted once.

```
derek@derek-VirtualBox:~/OS/PSET #2$ ls testMulti/
abc.txt
derek@derek-VirtualBox:~/OS/PSET #2$ link testMulti/abc.txt testMulti/copy
derek@derek-VirtualBox:~/OS/PSET #2$ ls testMulti/
abc.txt  copy
derek@derek-VirtualBox:~/OS/PSET #2$ ./fileChecker ./testMulti
# of block device inodes:      0.
# of character device inodes:  0.
# of directory inodes:        1.
# of FIFO/pipe inodes:        0.
# of symlink inodes:          0.
# of regular file inodes:     1.
# of sock inodes:             0.
Total size of all regular files: 9.
Total disk blocks allocated:   1.
# of inodes with nlink > 1:    1.
# of invalid symlinks:         0.
# of directory entries with problematic names: 0.
```

Figure 11: Reported results from running:
./fileChecker ./testMulti