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/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 t
arget.
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