Gebze Technical University
Computer Engineering

System Programming

CSE344 – 2021

HW1-REPORT

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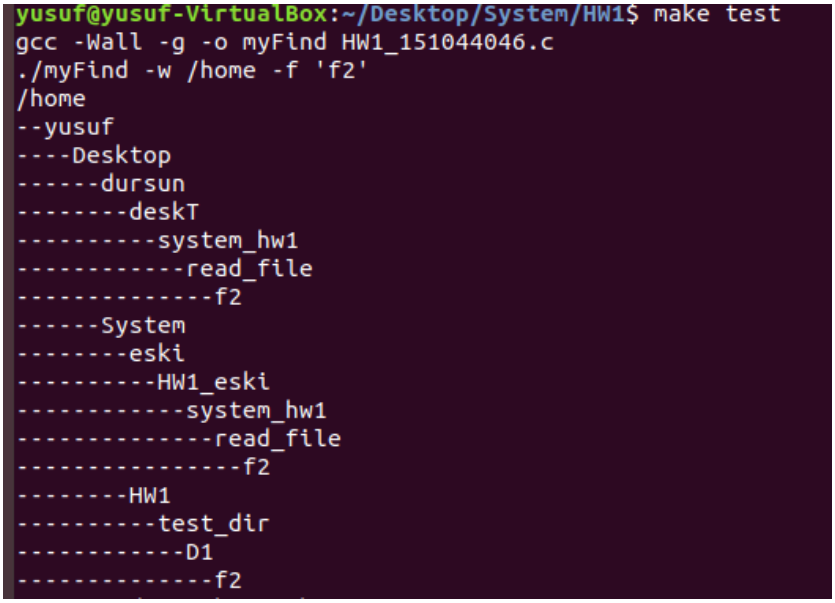
Implemented Requirements

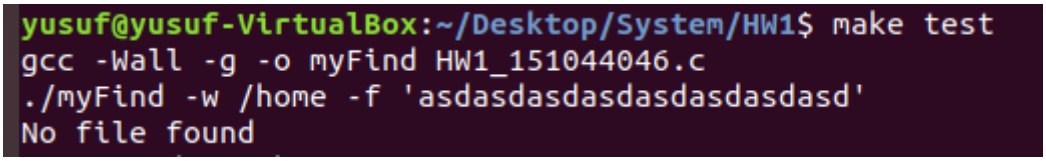
1-) The program can search for any combination of the following file properties.

- Filename
- File size
- File type
- Permissions
- Number of link

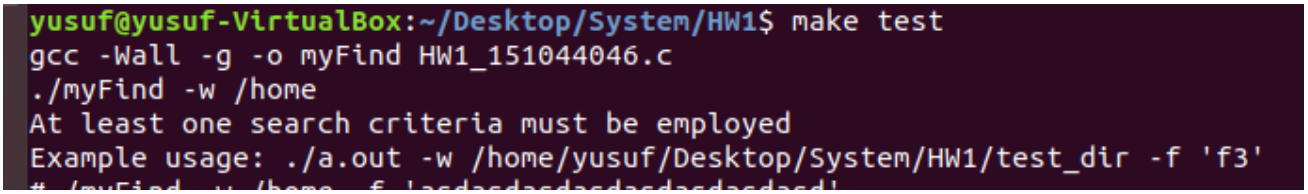
Output printed as nicely formatted tree. Sample output is in below:



2-) If no file satisfying the search criteria has been founded "No file found" message printed.



3-) If the required command line arguments are missing/invalid, The program prints usage information and exit.



4-) The program tested with Valgrind. Program has no memory leek.

```
==4448== HEAP SUMMARY:
==4448==     in use at exit: 0 bytes in 0 blocks
==4448==   total heap usage: 92,435 allocs, 92,435 frees, 2,998,758,544 bytes allocated
==4448==
==4448== All heap blocks were freed -- no leaks are possible
==4448==
```

4-) In case of CTRL-C the program stops execution, return all resources to the system and exit.

```
^CCtrl + z pressed
all resources returned to the system
yusuf@yusuf-VirtualBox:~/Desktop/System/HW1$
```

Searching File

The program search given directory recursively. When a target file founded, it added to the tree data structure.

walk_in_dir(directory):

    Iterate on element of directory:

        If(element == target_file):

            Tree.add(element)

        If(is_directory(element)):

            walk_in_dir(element)

Tree Data Structure

Founded target files added to tree data structure. After all target files founded, the tree printed to screen.

```
35  typedef struct dir_entry_s{
36      char fname[256];
37      int size;
38      int capacity;
39      struct dir_entry_s * sub_entries;
40
41  }dir_entry;
42
```

Tree data structure consists of directory entries. You can see the structure of directory entry from above.

Every directory and file represented as dir_entry in the tree. Every directory has a dir_entry pointer. The pointer points to an array. Initially array size is 20. During the program, size of array can be increased with realloc() function.

The files in the tree also has a dir_entry pointer. But it always points to NULL. Because regular files can't hold other files inside of it.

You can see the structure of the tree from below.