

System Programming Homework

We developed fully functioning terminal-based file manager that performs basic file operations (e.g. read, write, copy, delete file functions) and directory operations (e.g. ls, cd) using system class. That project taught us how to deal with the system calls and how to effectively use system calls to instruct the computer to perform specific actions in C language.

1. First in first, we decided to which operations we will use in our system and also which parameters a function takes.
2. After that, we made research about system call functions and libraries that system functions implemented.
3. Third, we decided to design menu which consist of 12 file and folder operations.
4. After completing file and folder operations, we added logging mechanism which **is centralized and puts every user interactions into /Log/log.txt file.**
5. Finally, we added color flavor to the our project.

- A. You should download our project. After that enter “make” command.
- B. Then “cd bin/“ folder to run program. There is an exec file named as ”mainProgram”
- C. Enter “./mainProgram” to run.

Here the program Menu appears..

```
===== Menü =====
1. List files and directories in current path
2. Go one directory back
3. Go one directory forward
4. Create directory
5. Delete directory
6. Find a string any specific directory path
7. change a file and directory permissions
8. Read a file
9. Write a file (truncate then write)
10. Create file
11. Delete file
12. Copy file
13. EXIT
=====
current path: /Users/halitertas/Desktop/mainProject/bin
>> |
```

Program menu shows you the operations that user can have and also the current path

- 1) Typing 1 in terminal it shows file and folders in the current path:

```
current path: /Users/halitertas/Desktop/mainProject/bin
>> 1
File and directories in current path:
Permissions File Size File Name
drwxr-xr-x    96  .
drwxr-xr-x   448  ..
-rwxr-xr-x  37032 mainProgram
Folder listing successful.
```

2) typing 2 goes one directory back:

```
>> 2
Folder has been changed.

===== Menü =====
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13. EXIT
=====

current path: /Users/halitertas/Desktop/mainProject
```

3) In order to go one directory forward, you should provide the system a folder name:

```
current path: /Users/halitertas/Desktop
>> 3
Enter directory name to get into: mainProject
Folder mainProject has been changed.

===== Menü =====
1. List files and directories in current path
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10. Create file
11. Delete file
12. Copy file
13. EXIT
=====

current path: /Users/halitertas/Desktop/mainProject
>> |
```

4) directory creation:

```
File and directories in current path:
Permissions File Size File Name
drwxr-xr-x    64      .
drwxr-xr-x   480     ..
Folder listing successful.
```

```
File and directories in current path:
Permissions File Size File Name
drwxr-xr-x    96      .
drwxr-xr-x   480     ..
drwxr-xr-x    64   deneme
Folder listing successful.
```

```
>> 4
Enter the name of the folder to be created: SystemProgHW
Folder Name: SystemProgHW has been created successfully
```

5) Directory deletion:

If directory empty, It deletes it. But directory is not empty, first it deletes what's in the directory and then deletes the directory itself.

```
.
├── Nurullah.txt
├── halit
│   └── halit.txt
└── oguz.txt

2 directories, 3 files
```

That is the SystemProgHW directory file structure.
Our purpose to delete SystemProgHW directory which has folder and files.

```
>> 5
Prompt a directory name to delete: SystemProgHW
/Users/halitertas/Desktop/mainProject/SystemProgHW
Found entry: /Users/halitertas/Desktop/mainProject/SystemProgHW/.DS_Store ---> It is file: .DS_Store | REMOVED SUCCESSFULLY!
Found entry: /Users/halitertas/Desktop/mainProject/SystemProgHW/halit ---> /Users/halitertas/Desktop/mainProject/SystemProgHW/halit
Found entry: /Users/halitertas/Desktop/mainProject/SystemProgHW/halit/halit.txt ---> It is file: halit.txt | REMOVED SUCCESSFULLY!
Folder Name: /Users/halitertas/Desktop/mainProject/SystemProgHW/halit has been successfully deleted
Found entry: /Users/halitertas/Desktop/mainProject/SystemProgHW/Nurullah.txt ---> It is file: Nurullah.txt | REMOVED SUCCESSFULLY!
Found entry: /Users/halitertas/Desktop/mainProject/SystemProgHW/oguz.txt ---> It is file: oguz.txt | REMOVED SUCCESSFULLY!
Folder Name: /Users/halitertas/Desktop/mainProject/SystemProgHW has been successfully deleted
```

6) Find a string any specific directory path:

```
.
├── Halit.txt
├── Nurullah.txt
└── Oguzhan.txt
```

Halit.txt -> halit
Oğuzhan -> Oğuzhan
Nurullah -> Nurullah
inside files.

System ask you to enter full file path.

Our purpose to find “a” character in the files which all have it.

```
>> 6
Enter the full path of the folder to search: /Users/halitertas/Desktop/mainProject/SystemProgHW
Enter the text you want to search for: a
--- Searching Results (a) ---
Found: /Users/halitertas/Desktop/mainProject/SystemProgHW/Nurullah.txt
Found: /Users/halitertas/Desktop/mainProject/SystemProgHW/Oguzhan.txt
Found: /Users/halitertas/Desktop/mainProject/SystemProgHW/Halit.txt
--- Searching Completed ---
```

Searching for “u” character in which only Oğuzhan and Nurullah file have.

```
>> 6
Enter the full path of the folder to search: /Users/halitertas/Desktop/mainProject/SystemProgHW
Enter the text you want to search for: u
--- Searching Results (u) ---
Found: /Users/halitertas/Desktop/mainProject/SystemProgHW/Nurullah.txt
Found: /Users/halitertas/Desktop/mainProject/SystemProgHW/Oguzhan.txt
--- Searching Completed ---
```

7) Changing permissions (file and folder)

```
File and directories in current path:
Permissions File Size File Name
drwxr-xr-x   160 .
drwxr-xr-x   480 ..
-rw-r--r--    8 Nurullah.txt
-rw-r--r--    8 Oguzhan.txt
-rw-r--r--    5 Halit.txt
Folder listing successful.
```

—>

```
File and directories in current path:
Permissions File Size File Name
drwxr-xr-x   160 .
drwxr-xr-x   480 ..
-rw-r--r--    8 Nurullah.txt
-rw-r--r--    8 Oguzhan.txt
-rwxrwxrwx    5 Halit.txt
```

```
>> 7
Enter the file or folder you want to change: Halit.txt
Enter new permissions (for example 0755): 0777
Permissions changed successfully: Halit.txt -> 777
```

8) Reading a file

```
current path: /Users/halitertas/Desktop/mainProject/SystemProgHW
>> 8
Enter the the file name to be read: Halit.txt
File read Halit.txt (5 bytes)

----- File Content (Halit.txt) -----
halit
```

```
>> 9
Enter the name of the file to be written: Halit.txt
If the file exists and will be overwritten (y), if not, will be created (n):y
Enter the text to be written to the file: halit halit halit
Written file Halit.txt (18 bytes)

--- File Content (Halit.txt) ---
halit halit halit
```

9) Creating a folder

```
File and directories in current path:
Permissions  File Size File Name
drwxr-xr-x   160    .
drwxr-xr-x   480   ..
-rw-r--r--    8  Nurullah.txt
-rw-r--r--    8  Oguzhan.txt
-rwxrwxrwx   18  Halit.txt
```

-->

```
File and directories in current path:
Permissions  File Size File Name
drwxr-xr-x   192    .
drwxr-xr-x   480   ..
-rwxr--r--    0  Unal.txt
-rw-r--r--    8  Nurullah.txt
-rw-r--r--    8  Oguzhan.txt
-rwxrwxrwx   18  Halit.txt
```

```
>> 10
Enter the name of the file to be created: Unal.txt
File created successfully: Unal.txt
```

11) Deleting a file

```
>> 11
Enter the name of the file to be deleted: Unal.txt
File deleted successfully: Unal.txt
```

12) Copying a file to another directory

```
.
├── CopyFile
├── Halit.txt
├── Nurullah.txt
└── Oguzhan.txt
```

2 directories, 3 files

----->

```
.
├── CopyFile
│   └── Halit.txt
├── Halit.txt
├── Nurullah.txt
└── Oguzhan.txt
```

2 directories, 4 files

```
>> 12
Enter the file name to copy: Halit.txt
Enter the name of the folder to copy (full path): /Users/halitertas/Desktop/SystemProgHW/CopyFile
File copied successfully: Halit.txt -> /Users/halitertas/Desktop/SystemProgHW/CopyFile/Halit.txt
```