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| **Academic Year** | **2025** |
| **Semester** | ☐ Fall ☒ Winter ☐ Summer |
| **Course Code - Name** | CSCI 3310 – System Programming |
| **Instructor** | Dr. Ghadeer Abdelkader |
| **Assessment** | Assignment 2 |

**Instructions:**

In order to obtain maximum marks in this assignment, please ensure the followings:

- Please submit your C file (.c) for this assignment.
- This assignment has a grade weight of **10%** marks of the course work.
- The assignment deadline is **March 24 at 11.59pm**. Submissions after the deadline will not be accepted.

Please note the followings:

- You are free to create directory structure anywhere, e.g., current directory or Desktop etc.
- You are free to create a log file anywhere e.g., current directory or Desktop etc.
- Make sure the log file in a text file.
- Create functions in your C program where appropriate to make your program more readable.
- Comment your C code to make it understandable by your TAs.

**Rubric**

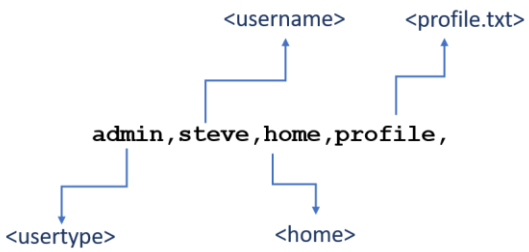
| **Rubric** | **Marks** |
|---|---|
| **Correct implementation of reading from a text file** | **2 marks** |
| **Correct implementation of the whole "creating directory structure"** | **4 marks** |
| **Correct implementation of setting the permission of profile.txt** | **2 marks** |
| **Correct implementation of log file** | **2 marks** |

**Question**

Silicon Consulting is planning to move from their legacy server to a modern server. You as a System Administrator has been given the responsibility of moving the directory structure to the new server. You are a smart administrator and hence decided to automate this process. So, you decided to write a C program that would serve as a script for creating the required directory structure on the new Linux server. To start with, you decided to test your script by creating only few directories for some of the consultants in your organization. Hence, you created a text file with the following content:

```
admin,steve,home,profile,
admin,bill,home,profile,
user,elon,home,profile,
user,jeff,home,profile,
```

The figure below shows the details of each entry per line in the file:




This text file is to be translated in to a Linux directory structure in the following way: `<usertype>/<username>/<home>/<profile.txt>` where:

- `<usertype>` is a directory either `admin` or `user`
- `<username>` is a directory with the name of the user in the organization
- `<home>` is a directory called home
- `<profile>` is a `profile.txt` file containing the text "`<username> profile created on <current system data and time>`, e.g., `Mon Jan 23 17:53:43 2025`"

**Requirement 1:**

As described above, you are required to write a C program that should read the entries from a text file and based on each entry per line of the file should create a directory structure. For example, your C program should read the first line of the text file and create a directory structure like below:

The program should keep reading lines of the file and keep creating directory structures based on the content of the file. You are free to read line by line and create directory structure or first read the whole file in an array and then create a directory structure. Please note that file read and creation of directory structure should work for as many numbers of lines and should not be limited to only 4 lines. Make sure the content of `profile.txt` file is as mentioned above and should have name of the username along with the date and time of the system.

**Requirement 2:**
After done creating the directory structure, you are required to set the permissions for the `profile.txt` file using a C program. Your program should be able to set the permissions of `profile.txt` file for each user to read only which shows the permissions of `profile.txt` for steve:

**Requirement 3:**
Once you are done with first two requirements, make sure to update your C program by adding a feature of creating a log file for your program, so that at each operation the action is logged into a text file. Besides having those entries in the log file, you are required to show those messages on the console as well.