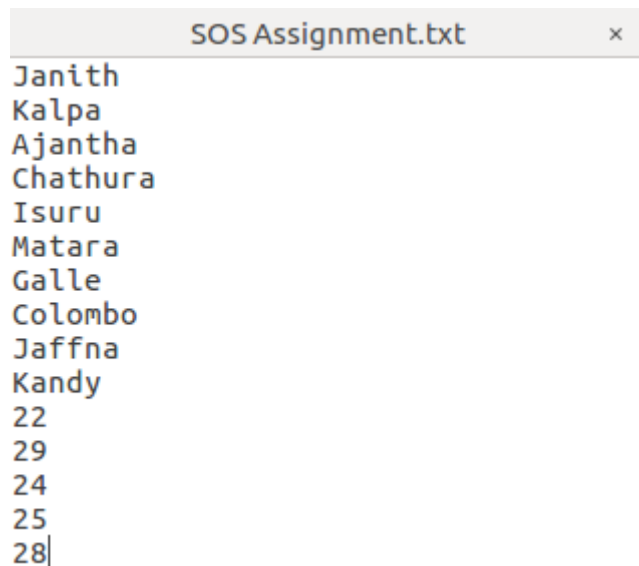


Operating Systems (IE2050) / Operating Systems Security (IE2032) Assignment I – 2019

Task 1

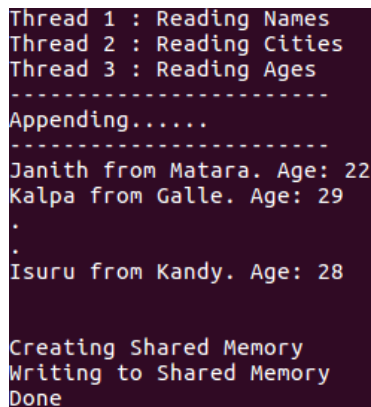
Create a text file which contains 5 names, 5 ages, and 5 cities. Each word and number should start in a new line as shown below.



```
SOS Assignment.txt
Janith
Kalpa
Ajantha
Chathura
Isuru
Matara
Galle
Colombo
Jaffna
Kandy
22
29
24
25
28|
```

Figure 1: Text file content example

Write a C program to read those 3 categories by using **3 separate threads** and display them on the terminal. The lines which you displayed must be **written into a shared memory location** (RAM), which should be accessible from another process later (Figure 2).



```
Thread 1 : Reading Names
Thread 2 : Reading Cities
Thread 3 : Reading Ages
-----
Appending.....
-----
Janith from Matara. Age: 22
Kalpa from Galle. Age: 29
.
.
Isuru from Kandy. Age: 28

Creating Shared Memory
Writing to Shared Memory
Done
```

Figure 2

Create and run another C program on a separate terminal which will access and display the contents stored in the shared memory (RAM)

```

Reading Shared Memory Content
Printing...

Janith from Matara. Age: 22
Kalpa from Galle. Age: 29
.
.
Isuru from Kandy. Age: 28
Done..!
  
```

Figure 3

Task 2

Develop a program which implements an application which contains two parties - HR and accountants. The two entities should access a shared location to view, upload, download and delete case studies.

A file called database is there and the information inside the database file looks like this.

Name	Attendance	Salary per day	Total salary
Emp 1000	20	1500	30000
Emp 1005	25	1800	45000
Emp 1010	23	1300	29900

HR should be able to perform the following tasks

- Add new employees to the database
- Edit / Delete employees
- Add / Edit / Delete attendance of employees
- Add / Edit / Delete employees' salary
- View total salary of employees

The accountants should be able to perform the following tasks

- View employees
- View attendance of employees
- View employee's salary per day
- **Calculate** the total salary of employees
- Add / Edit / Delete employees' total salary

Total salary = attendance X salary per day

Total salary can be only calculated by the accountants.

There should not be any interruptions for any process that takes place. (When HR people editing the file, accountants can't perform any action to the file). There should be only one file (database) and you can't create 2 or more files. Use mutex to lock and unlock the file.

Deliverables

Write a C program to cater to the above-mentioned requirements.

Important

- This is an individual assignment and submission is compulsory.
- This assignment carries 20% from your final grade.
- The due date for upload the work (C files) to course web is on or before 20th September 2019, 11.55pm.
- Viva schedule will be uploaded to the course web.