



Inspiring Excellence

**LAB ASSIGNMENT 02**

**SPRING 2024**

**COURSE CODE: CSE321**

**COURSE TITLE: Operating Systems**

**PREPARED BY**

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The following questions are related to C programming (struct and function):

### Task 1:

```
ubuntu@ubuntu-VirtualBox: ~/Desktop
ubuntu@ubuntu-VirtualBox:~$ cd Desktop
ubuntu@ubuntu-VirtualBox:~/Desktop$ gcc hello.c -o hehe
ubuntu@ubuntu-VirtualBox:~/Desktop$ ./hehe
Quantity Of Paratha: 25
Unit Price: 10
Quantity Of Vegetables: 5
Unit Price: 20
Quantity Of Mineral Water: 20
Unit Price: 20
Number of People: 6
Individual people will pay: 125.00 tk
ubuntu@ubuntu-VirtualBox:~/Desktop$
```

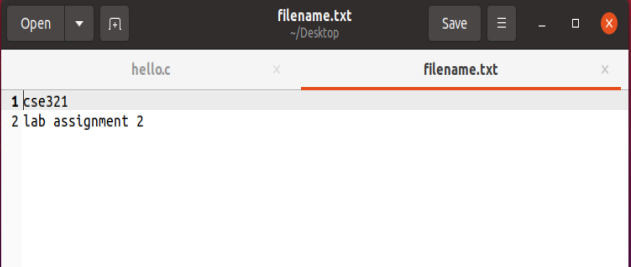
### Task 2:

```
ubuntu@ubuntu-VirtualBox: ~/Desktop
ubuntu@ubuntu-VirtualBox:~$ cd Desktop
ubuntu@ubuntu-VirtualBox:~/Desktop$ gcc hello.c -o hehe
ubuntu@ubuntu-VirtualBox:~/Desktop$ ./hehe
1
10000
6
28
496
8128
ubuntu@ubuntu-VirtualBox:~/Desktop$
```

The following questions are related to system call:

### Task 1:

```
ubuntu@ubuntu-VirtualBox: ~/Desktop
ubuntu@ubuntu-VirtualBox:~$ cd Desktop
ubuntu@ubuntu-VirtualBox:~/Desktop$ gcc hello.c -o hello
ubuntu@ubuntu-VirtualBox:~/Desktop$ ./hello filename.txt
Enter strings to write to the file. Enter "-1" to stop.
Enter string: cse321
Enter string: lab assignment 2
Enter string: -1
Strings have been written to filename.txt.
ubuntu@ubuntu-VirtualBox:~/Desktop$
```



### Task 2:

```
ubuntu@ubuntu-VirtualBox: ~/Desktop
ubuntu@ubuntu-VirtualBox:~$ cd Desktop
ubuntu@ubuntu-VirtualBox:~/Desktop$ gcc hello.c -o hello
ubuntu@ubuntu-VirtualBox:~/Desktop$ ./hello
I am grandchild
I am child
I am parent
ubuntu@ubuntu-VirtualBox:~/Desktop$
```

### Task 3:

```
ubuntu@ubuntu-VirtualBox: ~/Desktop
ubuntu@ubuntu-VirtualBox:~/Desktop$ gcc hello.c -o hello
ubuntu@ubuntu-VirtualBox:~/Desktop$ ./hello
Total number of processes created: 4
ubuntu@ubuntu-VirtualBox:~/Desktop$
```

### Task 4:

```
ubuntu@ubuntu-VirtualBox: ~/Desktop
ubuntu@ubuntu-VirtualBox:~$ cd Desktop
ubuntu@ubuntu-VirtualBox:~/Desktop$ gcc hello.c -o hello
ubuntu@ubuntu-VirtualBox:~/Desktop$ ./hello 8 5 9 2 1 6 10
Sorted array in descending order: 10 9 8 6 5 2 1
ubuntu@ubuntu-VirtualBox:~/Desktop$
```

```
ubuntu@ubuntu-VirtualBox: ~/Desktop
ubuntu@ubuntu-VirtualBox:~$ cd Desktop
ubuntu@ubuntu-VirtualBox:~/Desktop$ gcc hello.c -o hello
ubuntu@ubuntu-VirtualBox:~/Desktop$ ./hello 22 33 1 66 88 44
Odd/Even status:
22 is even
33 is odd
1 is odd
66 is even
88 is even
44 is even
ubuntu@ubuntu-VirtualBox:~/Desktop$
```

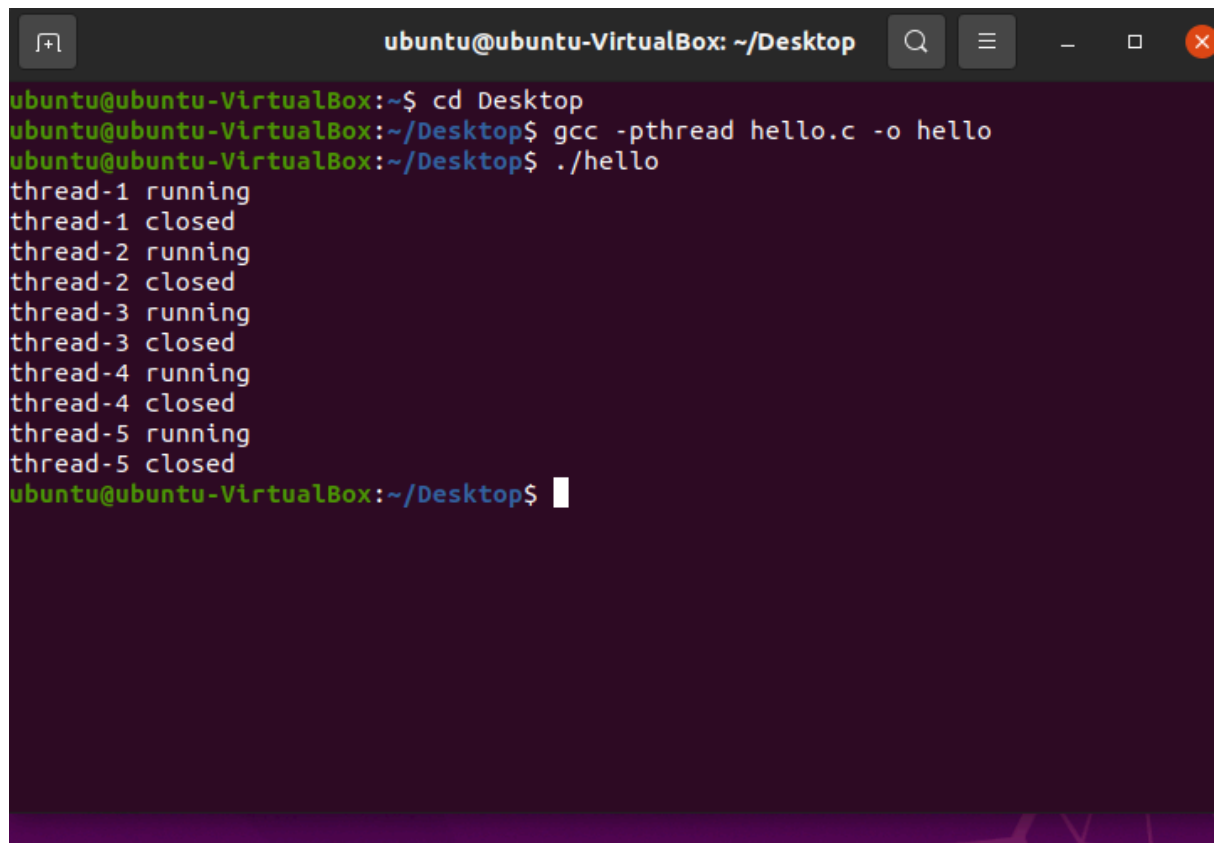
```
ubuntu@ubuntu-VirtualBox: ~/Desktop
ubuntu@ubuntu-VirtualBox:~/Desktop$ gcc hello.c -o hello
ubuntu@ubuntu-VirtualBox:~/Desktop$ ./hello 33 88 99 22 44 26
Sorted array in descending order: 99 88 44 33 26 22
Odd/Even status for each number in the sorted array:
33 is odd
88 is even
99 is odd
22 is even
44 is even
26 is even
ubuntu@ubuntu-VirtualBox:~/Desktop$
```

## Task 5:

```
ubuntu@ubuntu-VirtualBox: ~/Desktop
ubuntu@ubuntu-VirtualBox:~$ cd Desktop
ubuntu@ubuntu-VirtualBox:~/Desktop$ gcc hello.c -o hello
ubuntu@ubuntu-VirtualBox:~/Desktop$ ./hello
1. Parent process ID: 121348
2. Child process ID: 121349
3. Grandchild process ID: 121350
3. Grandchild process ID: 121351
3. Grandchild process ID: 121352
ubuntu@ubuntu-VirtualBox:~/Desktop$
```

The following questions are related to Threading:

## Task 1:

A terminal window titled 'ubuntu@ubuntu-VirtualBox: ~/Desktop' with standard window controls. The terminal shows a user navigating to the Desktop directory, compiling a C program 'hello.c' with pthread support, and running it. The output shows five threads (thread-1 to thread-5) each in a 'running' state followed by a 'closed' state, indicating successful execution and termination of all threads.

```
ubuntu@ubuntu-VirtualBox:~$ cd Desktop
ubuntu@ubuntu-VirtualBox:~/Desktop$ gcc -pthread hello.c -o hello
ubuntu@ubuntu-VirtualBox:~/Desktop$ ./hello
thread-1 running
thread-1 closed
thread-2 running
thread-2 closed
thread-3 running
thread-3 closed
thread-4 running
thread-4 closed
thread-5 running
thread-5 closed
ubuntu@ubuntu-VirtualBox:~/Desktop$
```

**Task 2:**

```
ubuntu@ubuntu-VirtualBox: ~/Desktop
ubuntu@ubuntu-VirtualBox:~$ cd Desktop
ubuntu@ubuntu-VirtualBox:~/Desktop$ gcc -pthread hello.c -o hello
ubuntu@ubuntu-VirtualBox:~/Desktop$ ./hello
Thread 0 prints 1
Thread 0 prints 2
Thread 0 prints 3
Thread 0 prints 4
Thread 0 prints 5
Thread 1 prints 6
Thread 1 prints 7
Thread 1 prints 8
Thread 1 prints 9
Thread 1 prints 10
Thread 2 prints 11
Thread 2 prints 12
Thread 2 prints 13
Thread 2 prints 14
Thread 2 prints 15
Thread 3 prints 16
Thread 3 prints 17
Thread 3 prints 18
Thread 3 prints 19
Thread 3 prints 20
Thread 4 prints 21
Thread 4 prints 22
Thread 4 prints 23
Thread 4 prints 24
Thread 4 prints 25
ubuntu@ubuntu-VirtualBox:~/Desktop$
```

### Task 3:

```
ubuntu@ubuntu-VirtualBox: ~/Desktop
ubuntu@ubuntu-VirtualBox:~/Desktop$ gcc -pthread hello.c -o hello
ubuntu@ubuntu-VirtualBox:~/Desktop$ ./hello
Enter the names of three users:
User 1: a
User 2: a
User 3: a
Youreka
ubuntu@ubuntu-VirtualBox:~/Desktop$ gcc -pthread hello.c -o hello
ubuntu@ubuntu-VirtualBox:~/Desktop$ ./hello
Enter the names of three users:
User 1: a
User 2: a
User 3: b
Miracle
ubuntu@ubuntu-VirtualBox:~/Desktop$ gcc -pthread hello.c -o hello
ubuntu@ubuntu-VirtualBox:~/Desktop$ ./hello
Enter the names of three users:
User 1: a
User 2: b
User 3: c
Hasta la vista
ubuntu@ubuntu-VirtualBox:~/Desktop$
```