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| **Name** | **Tashfeen Latif** |
| **Roll No** | **17P-6035** |
| **Section** | **CS-A** |
| **Course** | **Operating System** |
| **Professor** | **Dr.Muhammad Nauman** |

# Assignment #03

**1. The following code deals with basic thread creation**.

**(a) Write the following program and observe and *explain* the output.**

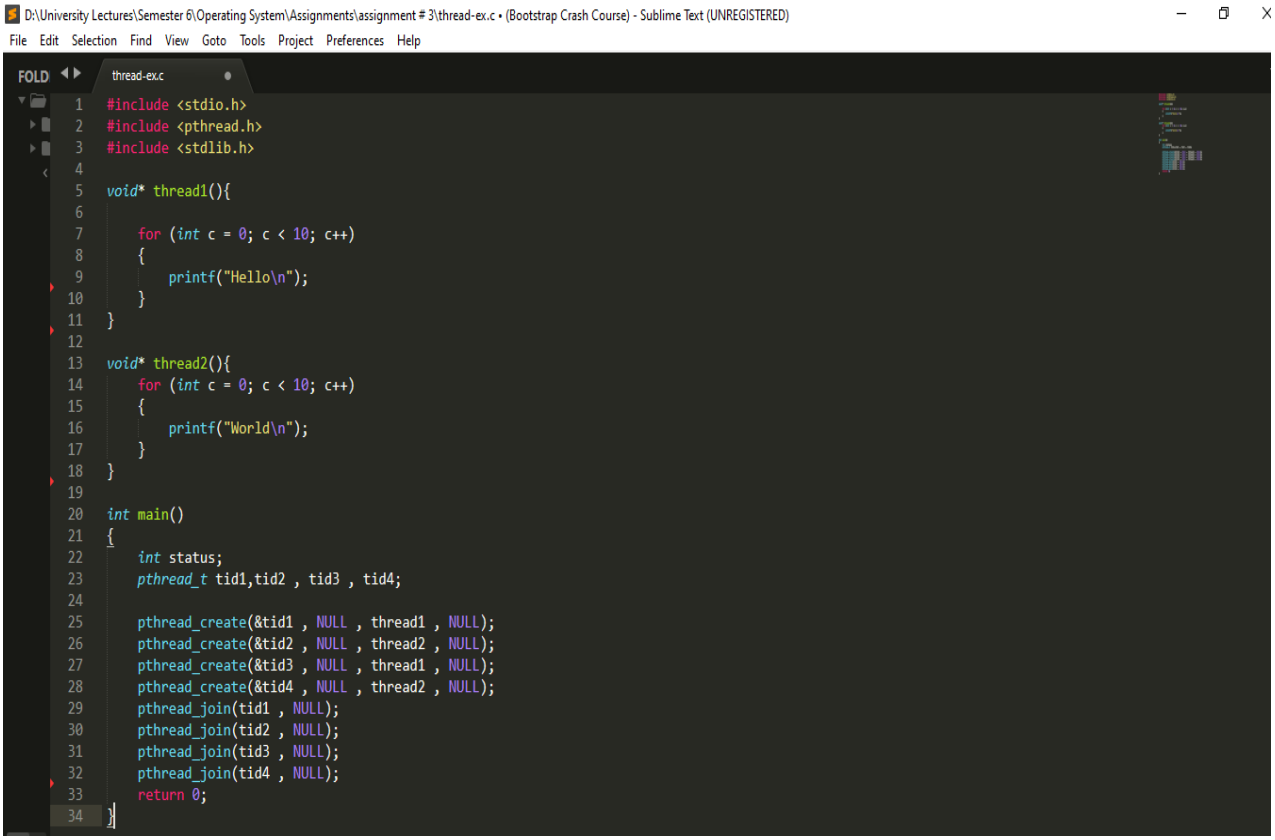
```
tashfeen222@hp /media/tashfeen222/4A902C1F902C144B/University Lectures/Semester 6/Operating System/Assignments/assignment3
$ gcc  -o thread-ex thread-ex.c  -lpthread
tashfeen222@hp /media/tashfeen222/4A902C1F902C144B/University Lectures/Semester 6/Operating System/Assignments/assignment3
$ ./thread-ex
Hello
Hello
Hello
Hello
World
World
World
World
World
World
World
World
World
World
Hello
Hello
Hello
Hello
Hello
Hello
```

**Observation And Explanation:-**

The sequence of output depends on the execution of threads in the program .So every time output depends on the threads execution. This is because if we run program once again and more .output is not same in all time this is because sequence of output depends on the execution of threads.

```
┌──tashfeen222@hp /media/tashfeen222/4A902C1F902C144B/University Lectures/Semester 6/Operating System/Assignments/assignment3
└─$ gcc  -o thread-ex thread-ex.c  -lpthread
┌──tashfeen222@hp /media/tashfeen222/4A902C1F902C144B/University Lectures/Semester 6/Operating System/Assignments/assignment3
└─$ ./thread-ex
Hello
Hello
Hello
Hello
Hello
Hello
Hello
Hello
World
World
World
World
World
World
World
World
World
World
World
Hello
Hello
```

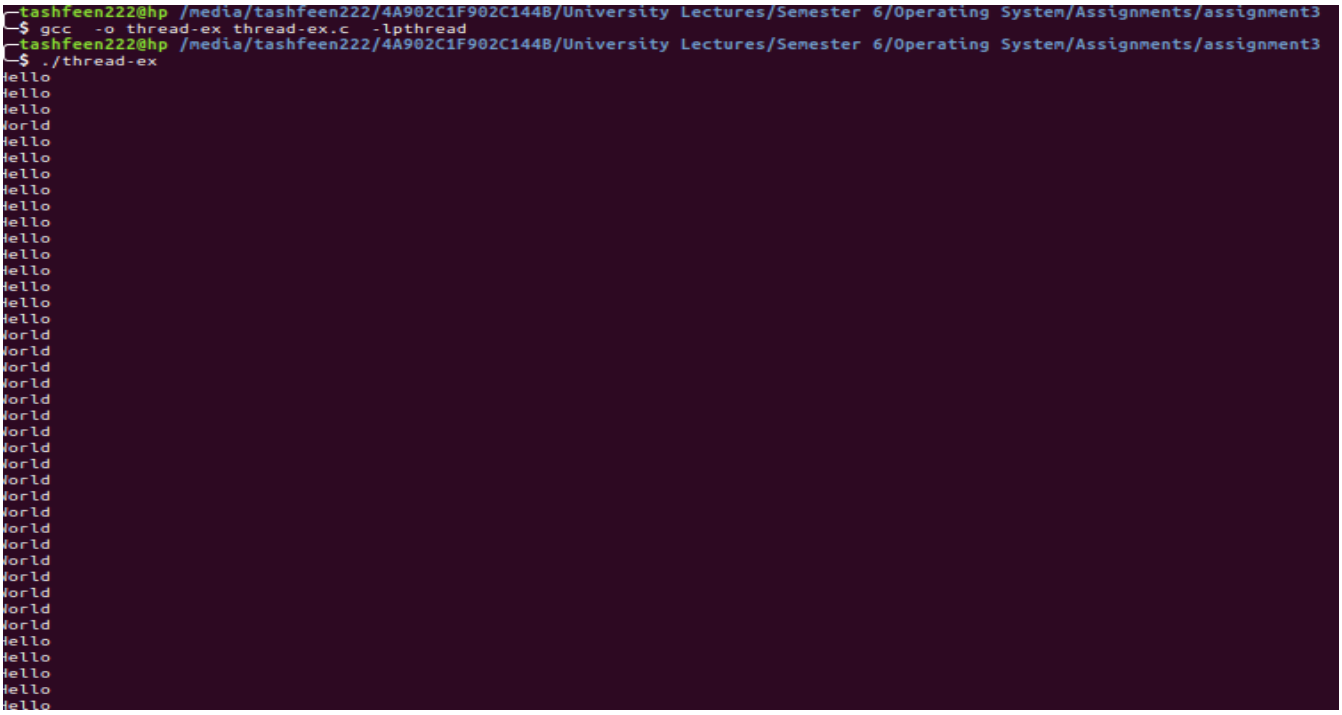
**(b) Modify the program to create four threads using the same two functions (thread1 and thread2)**



**(c) Run both versions and include screenshots of the output.**

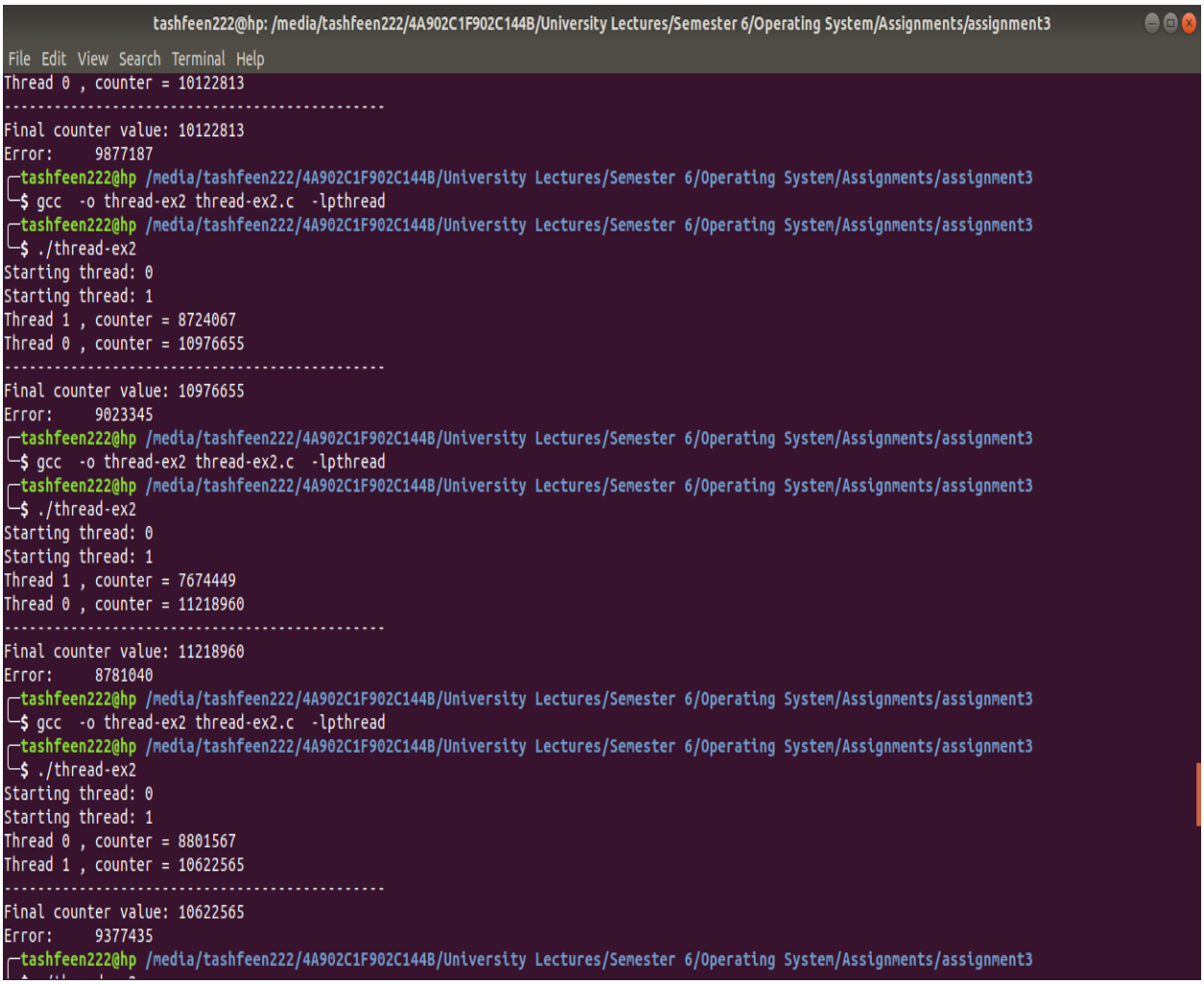
**Two Thread Execution:-**


**Four Thread Execution:-**




**2. Take a look at the following code:**

**(a) Compile and execute the program.**




## (b) Answer the following questions:

### i. What should be the value of the counter variable at the end?

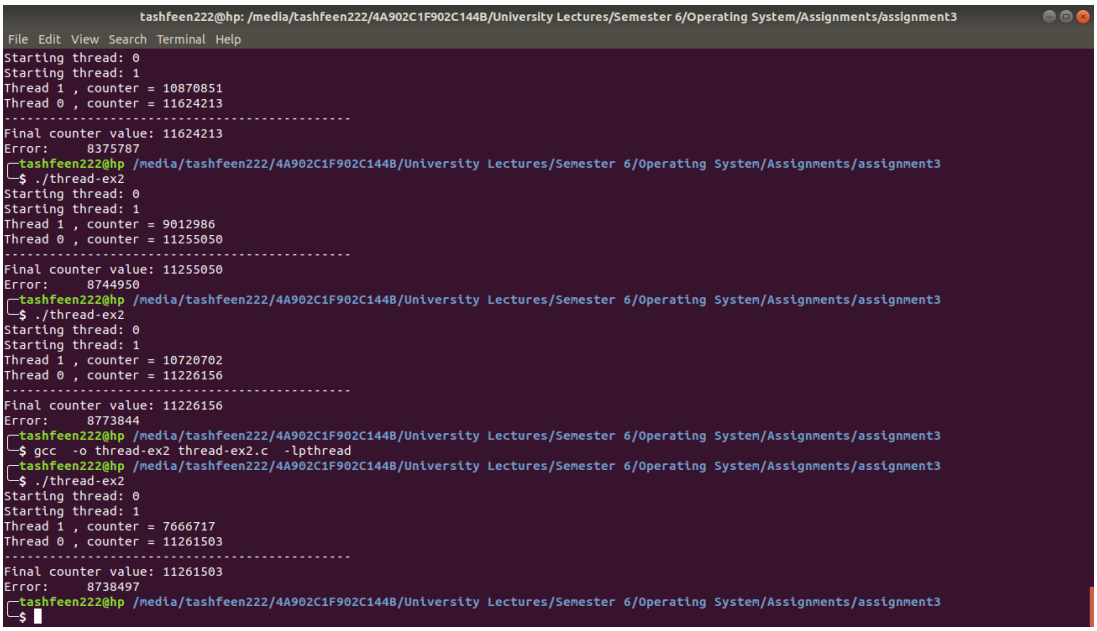
Final counter variable value is the same value of last thread execution counter.
Its mean

if thread1 execution end at last final counter value is same as the value of thread1
if thread0 execution end at last final counter value is same as the value of thread0

### ii. What is the value you get?

I get the value same as

if thread1 execution end at last final counter value is same as the value of thread1
if thread0 execution end at last final counter value is same as the value of thread0

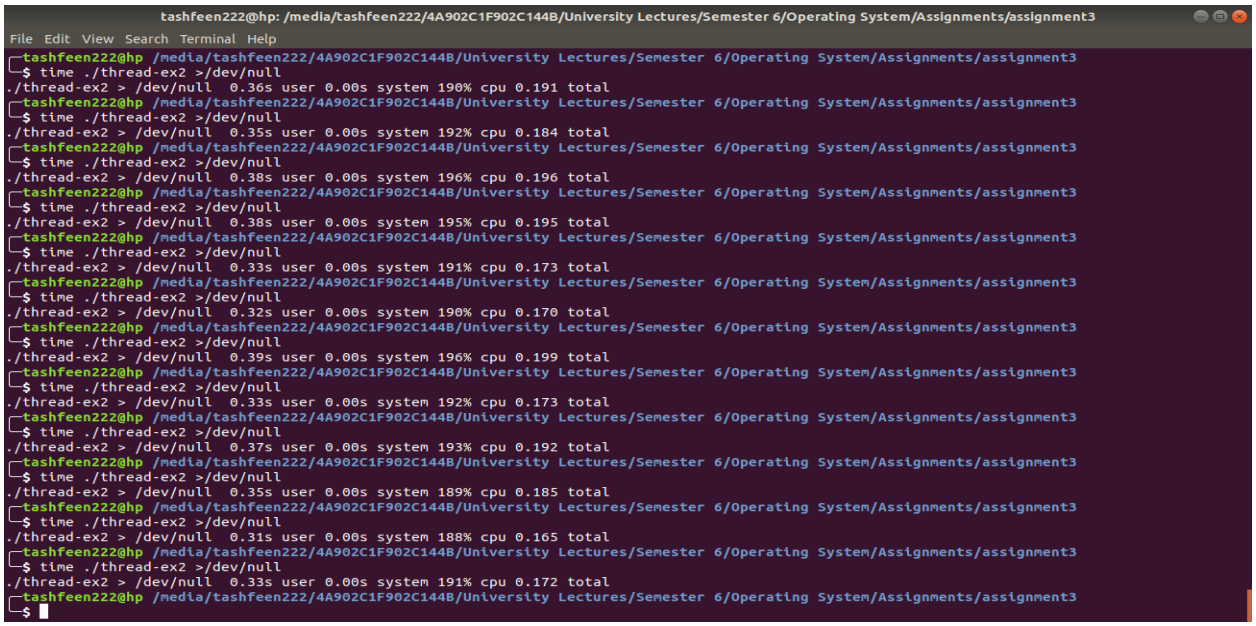



### iii. How large is the error and how much does it vary on different runs?

Error is so large in every time program running. And it actually vary in each time running the program .And its range approximately 7700000 to 10700000 on my system approximately

### iv. How much *user time* (rougly) does the program take to run on your system?

Approximately 0.35s

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