Report: Assignment 3

PLAGIARISM STATEMENT

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Date: 22/11/20

Signature: SS

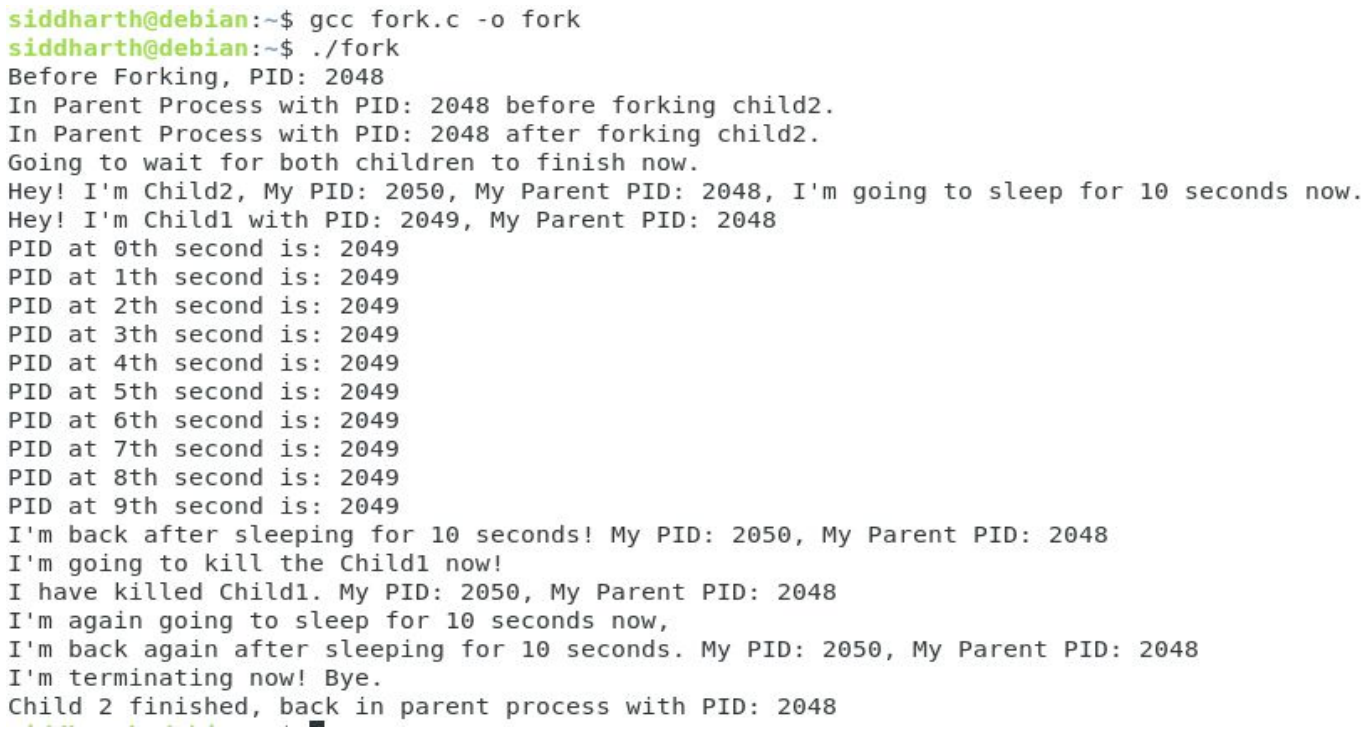
Question 1:

Solution:
We fork two child processes and apply the given conditions as given in the assignment.
The program starts from the parent process which then waits for the Child2 process to complete execution. As the Child2 process sleeps for 10 seconds, the Child1 process starts its execution and starts printing a statement every second.
Since the Child2 killed the Child1 just after waking up after 10 seconds, the child 1 could therefore print only 10 statements.
The child 2 sleeps for another 10 seconds and then gets terminated.
The parent process starts execution after this and gets terminated finally.

Terminal:
```
siddharth@debian:~$ gcc fork.c -o fork
siddharth@debian:~$ ./fork
Before Forking, PID: 2048
In Parent Process with PID: 2048 before forking child2.
In Parent Process with PID: 2048 after forking child2.
Going to wait for both children to finish now.
```

Hey! I'm Child2, My PID: 2050, My Parent PID: 2048, I'm going to sleep for 10 seconds now.
Hey! I'm Child1 with PID: 2049, My Parent PID: 2048
PID at 0th second is: 2049
PID at 1th second is: 2049
PID at 2th second is: 2049
PID at 3th second is: 2049
PID at 4th second is: 2049
PID at 5th second is: 2049
PID at 6th second is: 2049
PID at 7th second is: 2049
PID at 8th second is: 2049
PID at 9th second is: 2049
I'm back after sleeping for 10 seconds! My PID: 2050, My Parent PID: 2048
I'm going to kill the Child1 now!
I have killed Child1. My PID: 2050, My Parent PID: 2048
I'm again going to sleep for 10 seconds now,
I'm back again after sleeping for 10 seconds. My PID: 2050, My Parent PID: 2048
I'm terminating now! Bye.
Child 2 finished, back in parent process with PID: 2048

Screenshot:



Question 2

Solution:

We take a buffer of size 12 so that we can store 10 values in it along with “in” and “out” values to keep track whether the buffer overflows and we need to start consuming or not.

We also have to give writing access to the consumer so that the consumer can update the values of out and we can keep track of it.

We put conditions related to the values at “in” and “out” and decide if we can start consuming or not.

We also make sure that the buffer doesn’t overflow and make a circular buffer so that the producer can keep on producing given that the consumer keeps on consuming.

Rest details based on codes are written in the program files as comments.

Terminal: liveproducer

```
siddharth@debian:~$ gcc liveproducer.c -lrt -o liveproducer
siddharth@debian:~$ ./liveproducer
Enter the value to write in the buffer: 34
Producer with PID: 1995 writing 34 to the 0th slot of the Buffer.
Enter the value to write in the buffer: 32
Producer with PID: 1995 writing 32 to the 1th slot of the Buffer.
Enter the value to write in the buffer: 56
Producer with PID: 1995 writing 56 to the 2th slot of the Buffer.
Enter the value to write in the buffer: 76
Producer with PID: 1995 writing 76 to the 3th slot of the Buffer.
Enter the value to write in the buffer: 87
Producer with PID: 1995 writing 87 to the 4th slot of the Buffer.
Enter the value to write in the buffer: 46
Producer with PID: 1995 writing 46 to the 5th slot of the Buffer.
Enter the value to write in the buffer: 97
Producer with PID: 1995 writing 97 to the 6th slot of the Buffer.
Enter the value to write in the buffer: 31
Producer with PID: 1995 writing 31 to the 7th slot of the Buffer.
Enter the value to write in the buffer: 6
Producer with PID: 1995 writing 6 to the 8th slot of the Buffer.
Enter the value to write in the buffer: 68
Producer with PID: 1995 writing 68 to the 9th slot of the Buffer.
```

Enter the value to write in the buffer: 97
Producer with PID: 1995 writing 97 to the 0th slot of the Buffer.
Enter the value to write in the buffer: 46
Producer with PID: 1995 writing 46 to the 1th slot of the Buffer.
Enter the value to write in the buffer: 35
Producer with PID: 1995 writing 35 to the 2th slot of the Buffer.
Enter the value to write in the buffer: 46
Producer with PID: 1995 writing 46 to the 3th slot of the Buffer.
Enter the value to write in the buffer: 75
Producer with PID: 1995 writing 75 to the 4th slot of the Buffer.
Enter the value to write in the buffer: 68
Producer with PID: 1995 writing 68 to the 5th slot of the Buffer.
Enter the value to write in the buffer: 79
Producer with PID: 1995 writing 79 to the 6th slot of the Buffer.
Enter the value to write in the buffer: 08
Producer with PID: 1995 writing 8 to the 7th slot of the Buffer.
Enter the value to write in the buffer:

Terminal: liveconsumer

siddharth@debian:~$ gcc liveconsumer.c -lrt -o liveconsumer
siddharth@debian:~$ ./liveconsumer
Consumer with PID: 1996 reading 34 from 0th slot.
Consumer with PID: 1996 reading 32 from 1th slot.
Consumer with PID: 1996 reading 56 from 2th slot.
Consumer with PID: 1996 reading 76 from 3th slot.
Consumer with PID: 1996 reading 87 from 4th slot.
Consumer with PID: 1996 reading 46 from 5th slot.
Consumer with PID: 1996 reading 97 from 6th slot.
Consumer with PID: 1996 reading 31 from 7th slot.
Consumer with PID: 1996 reading 6 from 8th slot.
Consumer with PID: 1996 reading 68 from 9th slot.
Consumer with PID: 1996 reading 97 from 0th slot.
Consumer with PID: 1996 reading 46 from 1th slot.
Consumer with PID: 1996 reading 35 from 2th slot.
Consumer with PID: 1996 reading 46 from 3th slot.
Consumer with PID: 1996 reading 75 from 4th slot.
Consumer with PID: 1996 reading 68 from 5th slot.
Consumer with PID: 1996 reading 79 from 6th slot.
Consumer with PID: 1996 reading 8 from 7th slot.

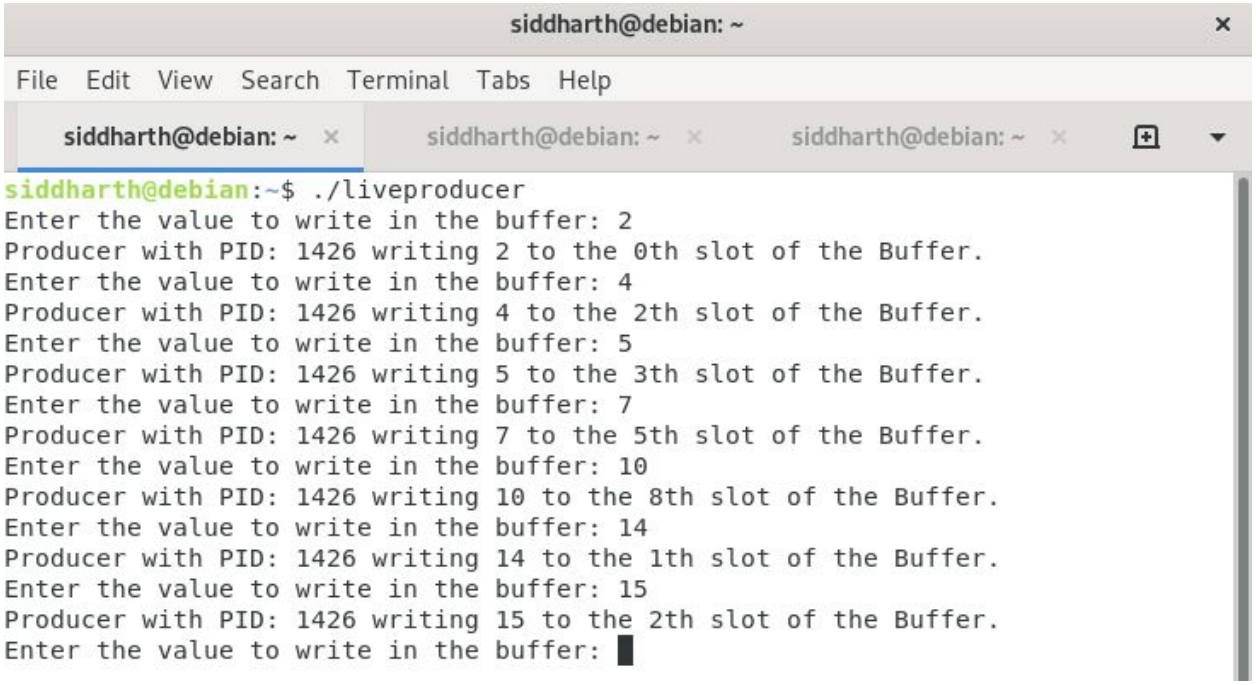
Screenshots:

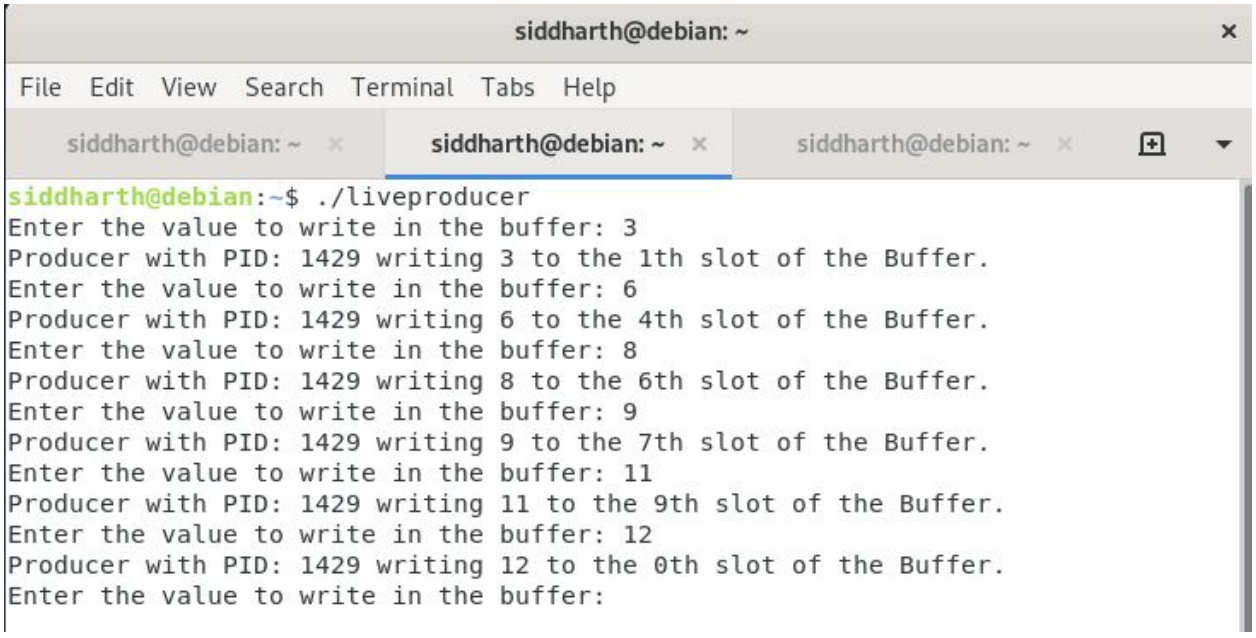
```
siddharth@debian:~$ gcc liveproducer.c -lrt -o liveproducer
siddharth@debian:~$ ./liveproducer
Enter the value to write in the buffer: 34
Producer with PID: 1995 writing 34 to the 0th slot of the Buffer.
Enter the value to write in the buffer: 32
Producer with PID: 1995 writing 32 to the 1th slot of the Buffer.
Enter the value to write in the buffer: 56
Producer with PID: 1995 writing 56 to the 2th slot of the Buffer.
Enter the value to write in the buffer: 76
Producer with PID: 1995 writing 76 to the 3th slot of the Buffer.
Enter the value to write in the buffer: 87
Producer with PID: 1995 writing 87 to the 4th slot of the Buffer.
Enter the value to write in the buffer: 46
Producer with PID: 1995 writing 46 to the 5th slot of the Buffer.
Enter the value to write in the buffer: 97
Producer with PID: 1995 writing 97 to the 6th slot of the Buffer.
Enter the value to write in the buffer: 31
Producer with PID: 1995 writing 31 to the 7th slot of the Buffer.
Enter the value to write in the buffer: 6
Producer with PID: 1995 writing 6 to the 8th slot of the Buffer.
Enter the value to write in the buffer: 68
Producer with PID: 1995 writing 68 to the 9th slot of the Buffer.
Enter the value to write in the buffer: 97
Producer with PID: 1995 writing 97 to the 0th slot of the Buffer.
Enter the value to write in the buffer: 46
Producer with PID: 1995 writing 46 to the 1th slot of the Buffer.
Enter the value to write in the buffer: 35
Producer with PID: 1995 writing 35 to the 2th slot of the Buffer.
Enter the value to write in the buffer: 46
Producer with PID: 1995 writing 46 to the 3th slot of the Buffer.
Enter the value to write in the buffer: 75
Producer with PID: 1995 writing 75 to the 4th slot of the Buffer.
```

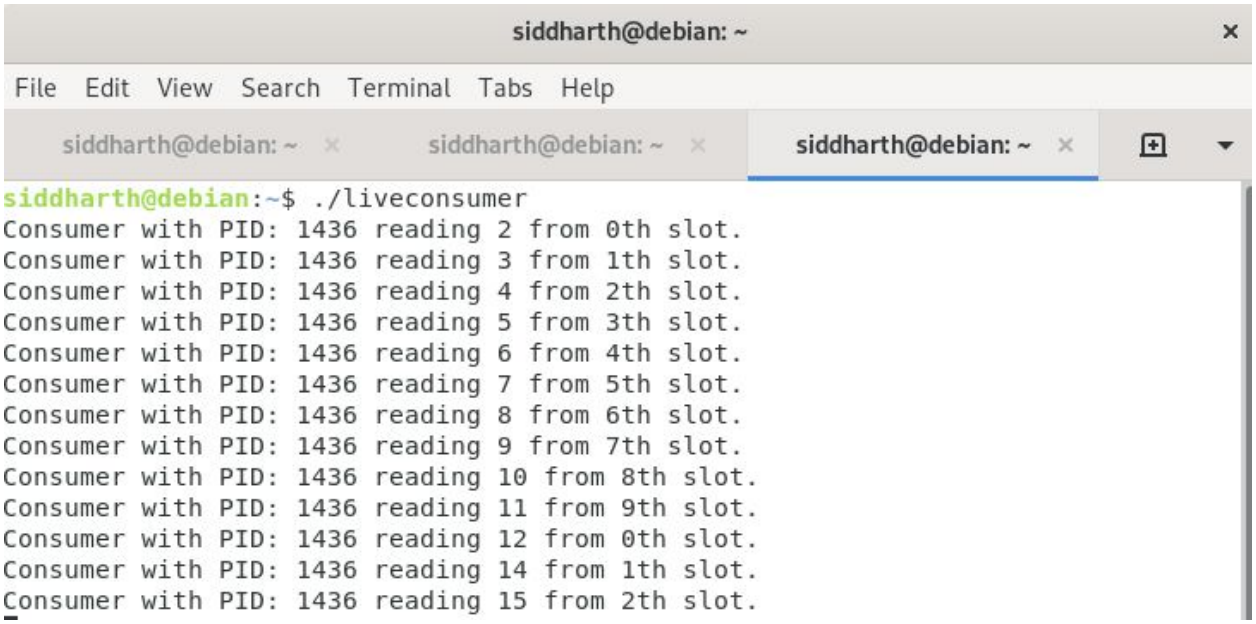
```
siddharth@debian:~$ gcc liveconsumer.c -lrt -o liveconsumer
siddharth@debian:~$ ./liveconsumer
Consumer with PID: 1996 reading 34 from 0th slot.
Consumer with PID: 1996 reading 32 from 1th slot.
Consumer with PID: 1996 reading 56 from 2th slot.
Consumer with PID: 1996 reading 76 from 3th slot.
Consumer with PID: 1996 reading 87 from 4th slot.
Consumer with PID: 1996 reading 46 from 5th slot.
Consumer with PID: 1996 reading 97 from 6th slot.
Consumer with PID: 1996 reading 31 from 7th slot.
Consumer with PID: 1996 reading 6 from 8th slot.
Consumer with PID: 1996 reading 68 from 9th slot.
Consumer with PID: 1996 reading 97 from 0th slot.
Consumer with PID: 1996 reading 46 from 1th slot.
Consumer with PID: 1996 reading 35 from 2th slot.
Consumer with PID: 1996 reading 46 from 3th slot.
Consumer with PID: 1996 reading 75 from 4th slot.
Consumer with PID: 1996 reading 68 from 5th slot.
Consumer with PID: 1996 reading 79 from 6th slot.
Consumer with PID: 1996 reading 8 from 7th slot.
```

We can also execute 2 or more producers at a time and one consumer to consume whatever is produced by both the producers.
The consumers would be consuming both from producer1 , producer2 … , producers.

Here's an example of the same where I used 2 producers in Tab1 and Tab2 and 1 consumer in the Tab3.







The inputs are given randomly in any of the producers as shown above but all those inputs get consumed by the consumer.