Government Engineering College, Thrissur

CS334 – Network Programming Lab

Documentation -

Exp 8 – First Reader Writer Problem

Date of Submission

06 June 2021

Submitted By

Kowsik Nandagopan D

Roll No 31

TCR18CS031

GECT CSE S6

Experiment 8

Implement the First Readers-Writers Problem (Using Threads and Shared Memory)

Executing program

- Code is provided in the **first.c** (Tested and verified on Ubuntu 20.04)

```
gcc first.c -lpthread -lrt && ./a.out
```

- **NOTE: This program is designed to accept only positive number. If the number is negative or zero, then corresponding error message will be displayed**

ALGORITHM

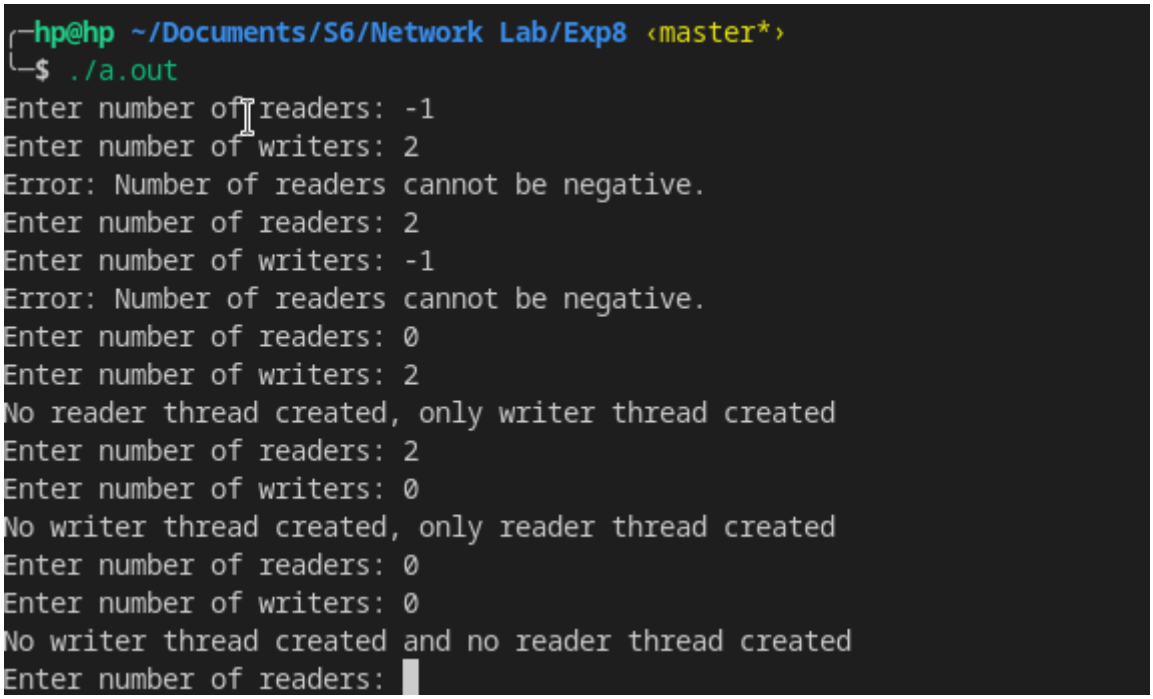
- Get number of readers and writers required from the console
- Initialize threads reader and writer threads
- Run threads,
- In reader thread – Reader should not wait for writer. When ever reader is invoked then, reader must be executed and **no writer is allowed to execute until all the readers have been executed**. *Disadvantage of writer starvation*. **Count of readers can be maintained by a shared variable and it must be mutex controlled**. Anyway algorithm allows parallel execution of readers.
- In writer thread – **Writer should wait until all readers in queue have been completed execution**. Semaphores must be used to guarantee that only one writer is executing at a time.
- Wait till all threads complete execution
- Destroy semaphores and mutex

P. T, O

Output / Screenshots

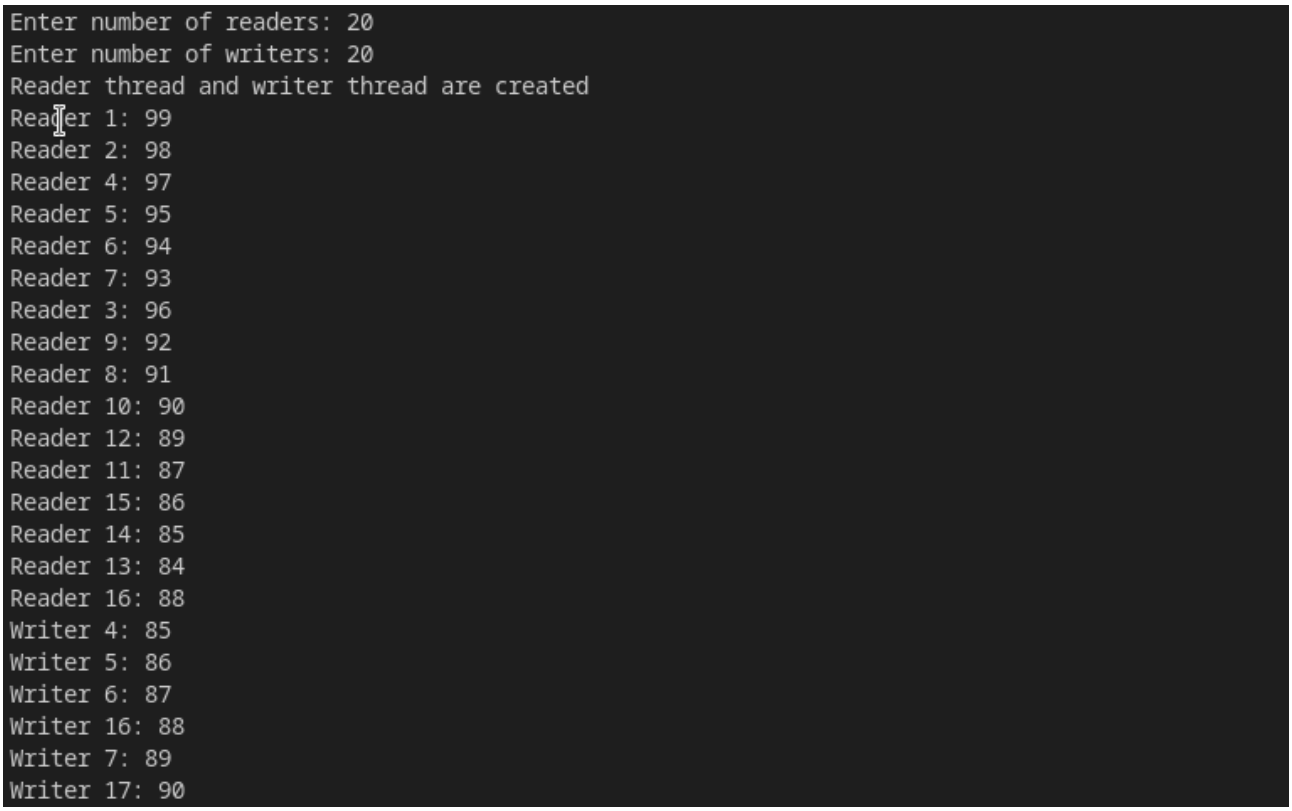
Error Messages

Error messages produced for non positive number of readers and writers



Thread Execution

Consider number of readers and writers as 20



Observation and Explanation

- Readers start execution and writers are kept waiting. We cannot see writer in between readers. This is because readers are given higher priority than writes
- We can see readers after writers threads have begun, during this period no writer is allowed to access shared memory space.