ASHNA SHAIKH   **[DT-22019]**

OPERATING SYSTEM LAB   **[CT-353]**

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LAB 05

```c
#include <semaphore.h>
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <pthread.h>

sem_t x, y;
int readercount = 0;

void *reader(void* param) {
    sem_wait(&x);
    readercount++;

    if (readercount == 1)
        sem_wait(&y);  // First reader blocks writers

    sem_post(&x);

    printf("%d reader is inside\n", readercount);
    sleep(3);

    sem_wait(&x);
    readercount--;

    if (readercount == 0)
        sem_post(&y);  // Last reader unblocks writers

    sem_post(&x);

    printf("%d Reader is leaving\n", readercount + 1);
    return NULL;
}

void *writer(void* param) {
    printf("Writer is trying to enter\n");
    sem_wait(&y);  // Only one writer allowed
    printf("Writer has entered\n");
    sleep(3);
    printf("Writer is leaving\n");
    sem_post(&y);
    return NULL;
}
```

```
Enter the number of readers: 2
Enter the number of writers: 3
Writer is trying to enter
Writer is trying to enter
1 reader is inside
2 reader is inside
Writer is trying to enter
2 Reader is leaving
1 Reader is leaving
Writer has entered
Writer is leaving
Writer has entered
Writer is leaving
Writer has entered
Writer is leaving


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Process exited after 16.77 seconds with return value 0
Press any key to continue . . . |
```