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Course	Operating System
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LAB:5

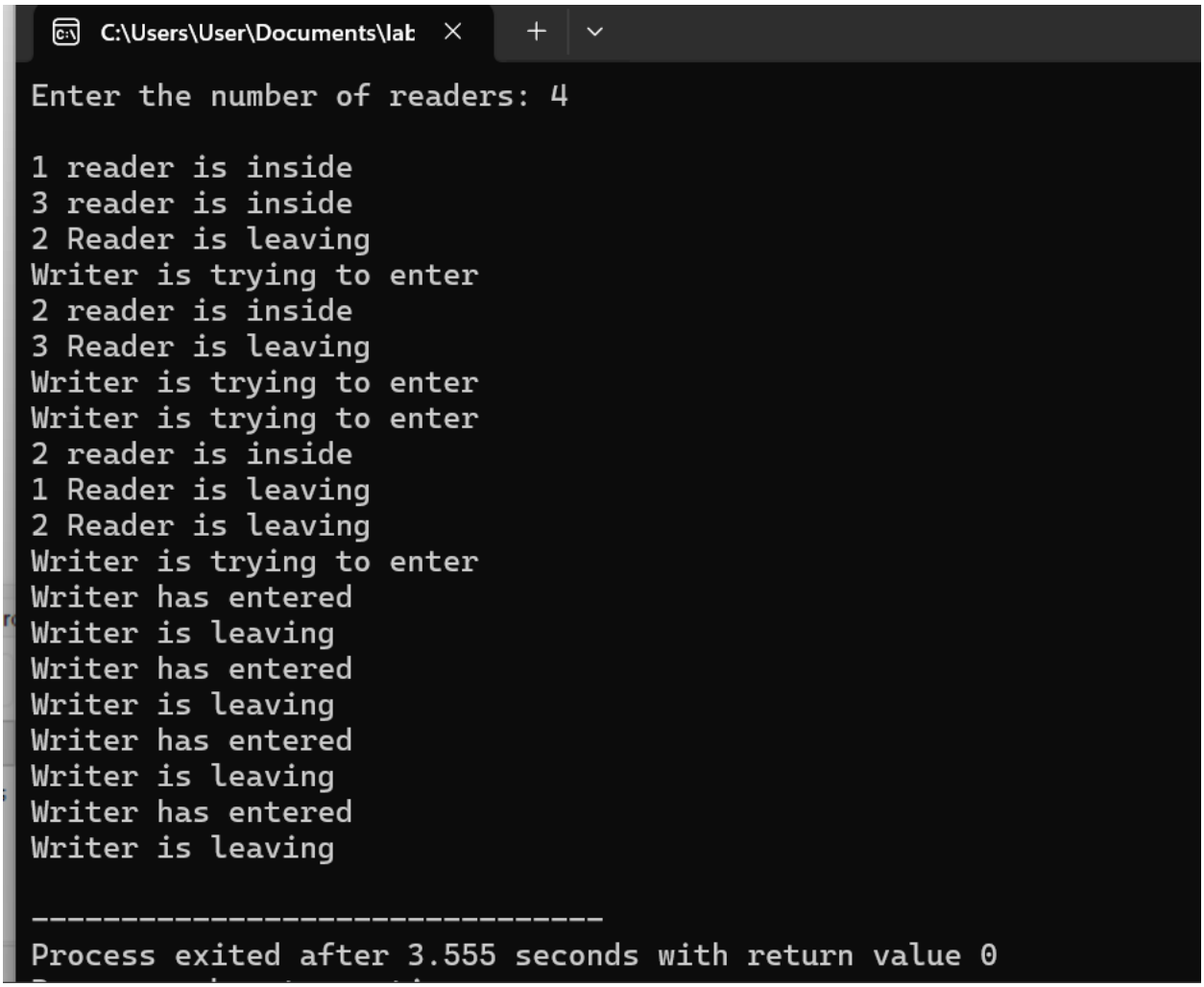
(Readers & Writers Problem)

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

sem_t x, y;
pthread_t tid;
pthread_t writerthreads[100], readerthreads[100];
int readercount = 0;

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

   if (readercount == 1)
      sem_wait(&y);
```

```
    sem_post(&x);

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

    sem_wait(&x);
    readercount--;

    if (readercount == 0) {
        sem_post(&y);
    }

    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);
```

```
    printf("Writer has entered\n");
    usleep(3);
    sem_post(&y);
    printf("Writer is leaving\n");

    return NULL;
}

int main() {
    int n2, i;

    printf("Enter the number of readers: ");
    scanf("%d", &n2);
    printf("\n");

    sem_init(&x, 0, 1);
    sem_init(&y, 0, 1);

    for (i = 0; i < n2; i++) {
        pthread_create(&readerthreads[i], NULL, reader, NULL);
        pthread_create(&writerthreads[i], NULL, writer, NULL);
```

```
    }


    for (i = 0; i < n2; i++) {
        pthread_join(readerthreads[i], NULL);
        pthread_join(writerthreads[i], NULL);
    }


    sem_destroy(&x);
    sem_destroy(&y);


    return 0;
}
```


C:\Users\User\Documents\lab
Enter the number of readers: 4
1 reader is inside
3 reader is inside
2 Reader is leaving
Writer is trying to enter
2 reader is inside
3 Reader is leaving
Writer is trying to enter
Writer is trying to enter
2 reader is inside
1 Reader is leaving
2 Reader is leaving
Writer is trying to enter
Writer has entered
Writer is leaving
Writer has entered
Writer is leaving
Writer has entered
Writer is leaving
Writer has entered
Writer is leaving

Process exited after 3.555 seconds with return value 0