



NED UNIVERSITY OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE & IT
Specialization in Data Science

CT-353
OPERATING SYSTEMS

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LAB NO : 05

```
#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(3000); // 3 milliseconds

    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");
    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);

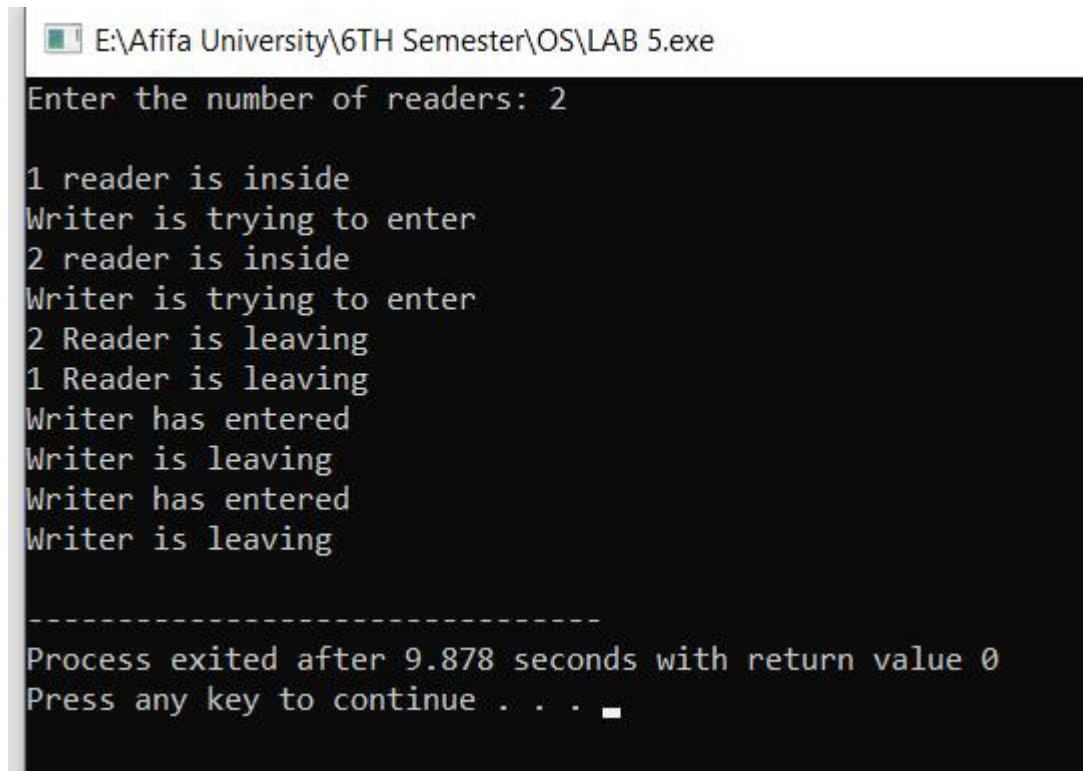
for (i = 0; i < n2; i++) {
    pthread_create(&readerthreads[i], NULL, reader, NULL);
    pthread_create(&writerthreads[i], NULL, writer, NULL);
}

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

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

return 0;
}

```



```

E:\Afifa University\6TH Semester\OS\LAB 5.exe
Enter the number of readers: 2

1 reader is inside
Writer is trying to enter
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

-----
Process exited after 9.878 seconds with return value 0
Press any key to continue . . .

```