

OS LAB 05

Question 1: Implement the above code and paste the screen shot of the output.

Solution:

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

sem_t x, y;
pthread_t tid;
pthread_t writethreads[100], readethreads[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");
```

```
    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");

    int n1[n2];
    sem_init(&x, 0, 1);
    sem_init(&y, 0, 1);

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

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

Enter the number of readers:2

```
1 reader is inside
2 Reader is leaving
2 reader is inside
1 Reader is leaving
Writer is trying to enter
Writer has entered
Writer is leaving
Writer is trying to enter
Writer has entered
Writer is leaving
```