OPERATING SYSTEMS
MIDTERM

Under the Guidance
of
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17BCE0581
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QUESTION - 6

CODE

```
#include<pthread.h>
#include<semaphore.h>
#include<stdio.h>
#include<stdlib.h>
pthread_mutex_t x,wsem;
pthread_t tid;
int readcount;
void intialize()
{
    pthread_mutex_init(&x,NULL);
    pthread_mutex_init(&wsem,NULL);readcount=0;
}

void * reader (void * satyam)
{
    int waittime;
    waittime = rand() % 5;
    printf("\nReader is trying to enter");
    pthread_mutex_lock(&x);
    readcount++;
    if(readcount==1)
        pthread_mutex_lock(&wsem);
    printf("\nReader: %d is inside ",readcount);
    pthread_mutex_unlock(&x);
    sleep(waittime);
    pthread_mutex_lock(&x);
    readcount--;
    if(readcount==0)
        pthread_mutex_unlock(&wsem);
    pthread_mutex_unlock(&x);
    printf("\nReader: %d is Leaving",readcount+1);
}

void * writer (void * satyam)
{
    int waittime;
    waittime=rand() % 3;
    printf("\nWriter is trying to enter");
    pthread_mutex_lock(&wsem);
    printf("\nWrite has entered");
```
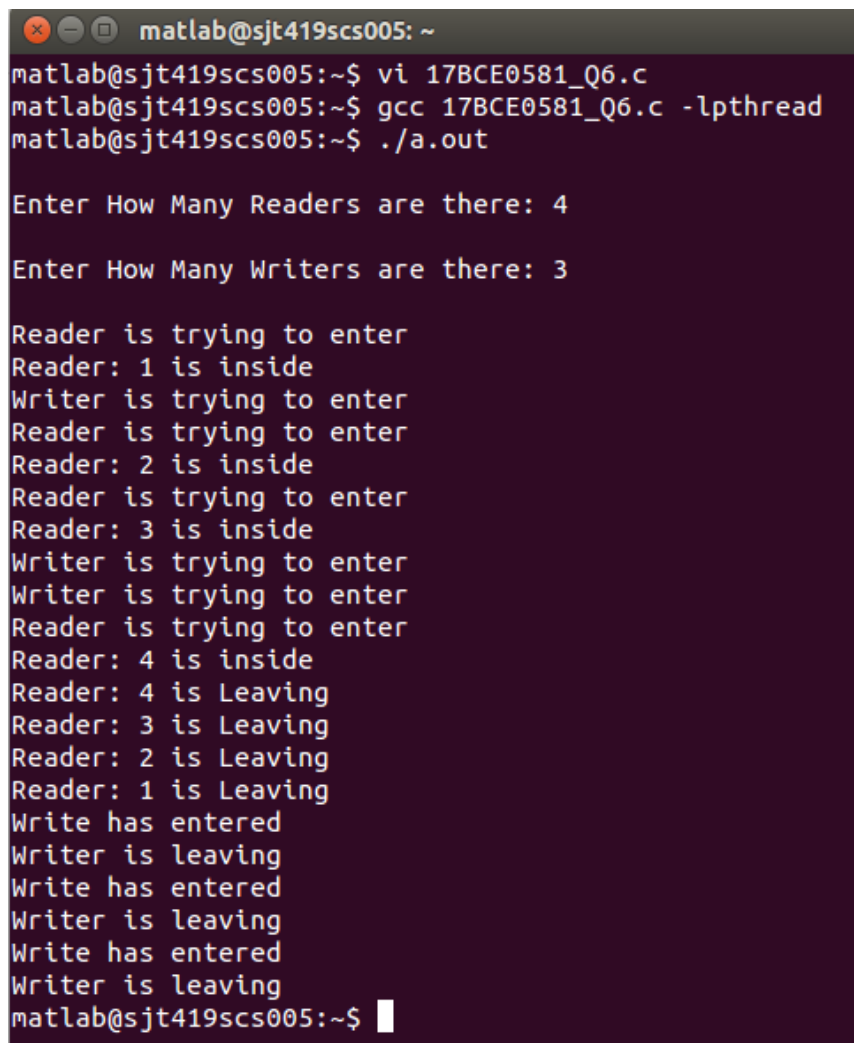
```c
        sleep(waittime);
        pthread_mutex_unlock(&wsem);
        printf("\nWriter is leaving");
        sleep(30);
        exit(0);
}

int main()
{
        intialize();
        int n1,n2,i;
        printf("\nEnter How Many Readers are there: ");
        scanf("%d",&n1);
        printf("\nEnter How Many Writers are there: ");
        scanf("%d",&n2);
        for(i=0;i<n1;i++)
                pthread_create(&tid,NULL,reader,NULL);
        for(i=0;i<n2;i++)
                pthread_create(&tid,NULL,writer,NULL);
        sleep(30);
        printf("\n");
        exit(0);
}
```

```
matlab@sjt419scs005: ~

matlab@sjt419scs005:~$ vi 17BCE0581_Q6.c
matlab@sjt419scs005:~$ gcc 17BCE0581_Q6.c -lpthread
matlab@sjt419scs005:~$ ./a.out

Enter How Many Readers are there: 4

Enter How Many Writers are there: 3

Reader is trying to enter
Reader: 1 is inside
Writer is trying to enter
Reader is trying to enter
Reader: 2 is inside
Reader is trying to enter
Reader: 3 is inside
Writer is trying to enter
Writer is trying to enter
Reader is trying to enter
Reader: 4 is inside
Reader: 4 is Leaving
Reader: 3 is Leaving
Reader: 2 is Leaving
Reader: 1 is Leaving
Write has entered
Writer is leaving
Write has entered
Writer is leaving
Write has entered
Writer is leaving
matlab@sjt419scs005:~$
```

```
matlab@sjt419scs005:~$ vi 17BCE0581_Q6.c
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Enter How Many Readers are there: 4

Enter How Many Writers are there: 3

Reader is trying to enter
Reader: 1 is inside
Writer is trying to enter
Reader is trying to enter
Reader: 2 is inside
Reader is trying to enter
Reader: 3 is inside
Writer is trying to enter
Writer is trying to enter
Reader is trying to enter
Reader: 4 is inside
Reader: 4 is Leaving
Reader: 3 is Leaving
Reader: 2 is Leaving
Reader: 1 is Leaving
Write has entered
Writer is leaving
Write has entered
Writer is leaving
Write has entered
Writer is leaving
matlab@sjt419scs005:~$
```