

ASSIGNMENT NO. 4B

```
#include<stdio.h>

#include<stdlib.h>

#include<pthread.h>

#include<semaphore.h>

#include<unistd.h>

void *writer_thr(int temp);

void *reader_thr(int temp);

sem_t mutex;

sem_t wrt;

int readcount=0,nwt,nrd;

void main()

{

    long int i;

    sem_init(&mutex,0,1);

    sem_init(&wrt,0,1);

    pthread_t reader[100],writer[100];

    printf("\n Enter number of readers:");

    scanf("%d",&nrd);

    printf("\n Enter number of writers:");

    scanf("%d",&nwt);

    for(i=1;i<=nwt;i++)

    {

        pthread_create(&writer[i],NULL,(void *)writer_thr,(int *)i);
```

```
pthread_join(writer[i],NULL);  
}
```

```
for(i=1;i<=nrd;i++)  
{  
pthread_create(&reader[i],NULL,(void *)reader_thr,(int *)i);  
}
```

```
for(i=1;i<=nrd;i++)  
{  
pthread_join(reader[i],NULL);  
}
```

```
sem_destroy(&wrt);  
sem_destroy(&mutex);  
}
```

```
void *reader_thr(int temp)  
{
```

```
printf("\n Reader %d is trying to enter database for reading.",temp);  
sem_wait(&mutex);  
readcount++;  
if(readcount==1)  
sem_wait(&wrt);  
sem_post(&mutex);
```

```
printf("\nReader %d is now reading in database.",temp);
```

```
sem_wait(&mutex);
```

```
readcount--;
```

```
if(readcount==0)
```

```
sem_post(&wrt);
```

```
sem_post(&mutex);
```

```
printf("\nReader %d has left the database.\n",temp);
```

```
sleep(3);
```

```
}
```

```
void *writer_thr(int temp)
```

```
{
```

```
printf("\nWriter %d is trying to enter database for modifying data",temp);
```

```
sem_wait(&wrt);
```

```
printf("\n Writer %d is writing in database.",temp);
```

```
sleep(3);
```

```
printf("\n Writer %d is leaving the database.\n",temp);
```

```
sem_post(&wrt);
```

```
}
```

OUTPUT:

```
guest-lzOeRo@ubuntu: ~
guest-lzOeRo@ubuntu:~$ gcc pr4b.c -lpthread
guest-lzOeRo@ubuntu:~$ ./a.out

Enter number of readers:5
Enter number of writers:4

Writer 1 is trying to enter database for modifying data
Writer 1 is writing in database.
Writer 1 is leaving the database.

Writer 2 is trying to enter database for modifying data
Writer 2 is writing in database.
Writer 2 is leaving the database.


Writer 3 is trying to enter database for modifying data
Writer 3 is writing in database.
Writer 3 is leaving the database.


Writer 4 is trying to enter database for modifying data
Writer 4 is writing in database.
Writer 4 is leaving the database.


Reader 5 is trying to enter database for reading.
Reader 5 is now reading in database.
Reader 5 has left the database.


Reader 4 is trying to enter database for reading.
Reader 4 is now reading in database.
Reader 4 has left the database.
```


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 Writer 2 is writing in database.
Writer 2 is leaving the database.


 Writer 3 is trying to enter database for modifying data
Writer 3 is writing in database.
Writer 3 is leaving the database.


 Writer 4 is trying to enter database for modifying data
Writer 4 is writing in database.
Writer 4 is leaving the database.


 Reader 5 is trying to enter database for reading.
Reader 5 is now reading in database.
Reader 5 has left the database.

 Reader 4 is trying to enter database for reading.
Reader 4 is now reading in database.
Reader 4 has left the database.

 Reader 3 is trying to enter database for reading.
Reader 3 is now reading in database.
Reader 3 has left the database.

 Reader 2 is trying to enter database for reading.
Reader 2 is now reading in database.
Reader 2 has left the database.

 Reader 1 is trying to enter database for reading.
Reader 1 is now reading in database.
Reader 1 has left the database.

 guest-lzOeRo@ubuntu:~\$