

READER & WRITER

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#include<stdio.h>
#include<unistd.h>
#include<pthread.h>
#include<semaphore.h>
#include<stdlib.h>
pthread_mutex_t rwmutex;
pthread_mutex_t lock;
int rdcnt,nr,nw;
pthread_t thread;
void *reader(void *arg);
void *writer(void *arg);
void init();
void main()
{
    int i;
    init();
    printf("\nEnter no of readers: ");
    scanf("%d",&nr);
    printf("\nEnter no of writers :");
    scanf("%d",&nw);
    for(i=0;i<nw;i++)
    {
        int *arg=malloc(sizeof(int *));
        *arg=i;
        pthread_create(&thread,NULL,writer,arg);
    }
    for(i=0;i<nr;i++)
    {
        int *arg=malloc(sizeof(int *));
        *arg=i;
        pthread_create(&thread,NULL,reader,arg);
    }

    for(i=0;i<nw;i++)
    {
        pthread_join(thread,NULL);
    }
    for(i=0;i<nr;i++)
    {
        pthread_join(thread,NULL);
    }
}
void init()
{
    pthread_mutex_init(&lock,NULL);
    pthread_mutex_init(&rwmutex,NULL);
    rdcnt=0;
}
void *reader(void *arg)
{

```

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    int i=*(int *)arg;
    int cnt=0;
    printf("\nreader %d is trying to read",i+1);
    pthread_mutex_lock(&lock);
    rdcnt++;
    if(rcnt==1)
        pthread_mutex_lock(&rwmutex);
    printf("\nreader %d is reading ",i+1);
    pthread_mutex_unlock(&lock);
    sleep(3);
    pthread_mutex_lock(&lock);
    rdcnt--;
    if(rcnt==0)
        pthread_mutex_unlock(&rwmutex);
    pthread_mutex_unlock(&lock);
    printf("\nreader %d is leaving",i+1);
}
void *writer(void *arg)
{
    int i=*(int *)arg;
    printf("\nwriter %d is trying to write",i+1);
    pthread_mutex_lock(&rwmutex);
    printf("\nwriter %d is writing ",i+1);
    sleep(3);
    pthread_mutex_unlock(&rwmutex);
    printf("\nwriter %d is leaving",i+1);
}

```

gcc -o rdwr rdwr.c -pthread
./rdwr

output:

Enter no of readers: 2

Enter no of writers :2

```

writer 1 is trying to write
writer 1 is writing
writer 2 is trying to write
reader 1 is trying to read
reader 2 is trying to read
writer 1 is leaving
writer 2 is writing
writer 2 is leaving
reader 1 is reading
reader 2 is reading
reader 1 is leaving
reader 2 is leaving

```