

Question: Write a program in C to implement the Reader Writer problem using Threads and Semaphores.

Solution:

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

int hr,min,sec,tid1,tid2;
void *read();void *write();void *ret;
sem_t s1,s2;
pthread_t rth,wth;

void main()
{
    sem_init(&s1,0,0);      sem_init(&s2,0,1);
    tid1 = pthread_create(&rth,NULL,&read,NULL);
    if(tid1 == 0)
        printf("\nrth created successfully");
    tid2 = pthread_create(&wth,NULL,&write,NULL);
    if(tid2 == 0)
        printf("\nwth created successfully");
    pthread_join(rth,NULL);
    pthread_join(wth,NULL);
    sem_destroy(&s1);
    sem_destroy(&s2);
}

void *read()
{
    printf("\nin read");
    while(hr <= 1)
    {
        sem_wait(&s2);
        printf("\n%d:%d:%d",hr,min,sec);
        sem_post(&s1);
        sleep(1);
    }
    return(&ret);
}

void *write()
{
    printf("\nin write");
    while(hr <= 1)
    {
        sem_wait(&s1);
        sec++;
        if(sec == 60){
            sec = 0;
            min++;
        }
        if(min == 60){
            min = 0;
            hr++;
        }
        sem_post(&s2);
        sleep(1);
    }
    return(&ret);
}
```