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#include <pthread.h>

#include <semaphore.h>

#include <stdio.h>

sem_t wrt;

pthread_mutex_t mutex;

int cnt = 1;

int numreader = 0;

void *writer(void *wno)
{
    sem_wait(&wrt);

    cnt = cnt*2;

    printf("Writer %d modified cnt to %d\n",*((int *)wno),cnt);

    sem_post(&wrt);

}

void *reader(void *rno)
{

    pthread_mutex_lock(&mutex);

    numreader++;

    if(numreader == 1) {

        sem_wait(&wrt);

    }

    pthread_mutex_unlock(&mutex);

    printf("Reader %d: read cnt as %d\n",*((int *)rno),cnt);

    pthread_mutex_lock(&mutex);

    numreader--;

    if(numreader == 0) {

        sem_post(&wrt);

    }

}

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    }

    pthread_mutex_unlock(&mutex);
}

int main()
{
    int i;

    pthread_t read[10], write[5];
    pthread_mutex_init(&mutex, NULL);
    sem_init(&wrt, 0, 1);

    int a[10] = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10};

    for( i = 0; i < 10; i++) {
        pthread_create(&read[i], NULL, (void *)reader, (void *)&a[i]);
    }

    for( i = 0; i < 5; i++) {
        pthread_create(&write[i], NULL, (void *)writer, (void *)&a[i]);
    }

    for( i = 0; i < 10; i++) {
        pthread_join(read[i], NULL);
    }

    for(i = 0; i < 5; i++) {
        pthread_join(write[i], NULL);
    }

    pthread_mutex_destroy(&mutex);
    sem_destroy(&wrt);

    return 0;

}

```

Output:

