

Task 9

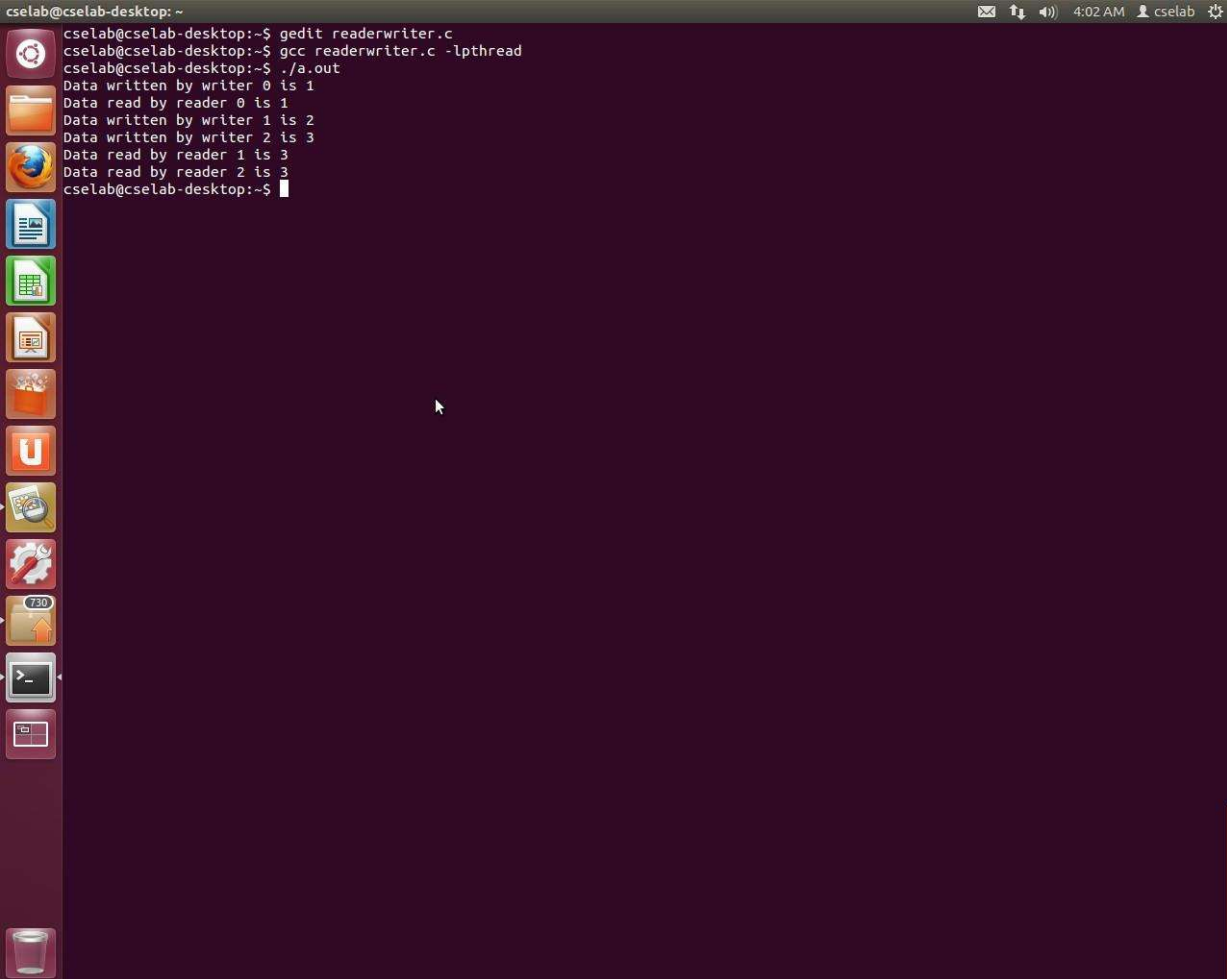
Task: Simulate the Readers –Writers problem using semaphores

Program:

```
#include<stdio.h>
#include<pthread.h>
#include<semaphore.h>
sem_t mutex,writeblock;
int data=0,rcount=0;
void *reader(void *arg)
{
    int f;
    f=((int)arg);
    sem_wait(&mutex);
    rcount=rcount+1;
    if(rcount==1)
    {
        sem_wait(&writeblock);
        sem_post(&mutex);
        printf("Data read by reader %d is %d\n",f,data);
        sem_wait(&mutex);
        rcount=rcount-1;
    }
    if(rcount==0)
    {
        sem_post(&writeblock);
        sem_post(&mutex);
    }
}
void *writer(void *arg)
{
    int f;
    f=((int)arg);
    sem_wait(&writeblock);
    data++;
    printf("Data written by writer %d is %d\n",f,data);
    sleep(1);
    sem_post(&writeblock);
}
void main()
{
    int i,b;
    pthread_t rtid[5],wtid[5];
    sem_init(&mutex,0,1);
    sem_init(&writeblock,0,1);
    for(i=0;i<=2;i++)
    {
        pthread_create(&wtid[i],NULL,writer,(void*)i);
        pthread_create(&rtid[i],NULL,reader,(void*)i);
    }
}
```

```
}  
for(i=0;i<=2;i++)  
{  
pthread_join(wtid[i],NULL);  
pthread_join(rtid[i],NULL);  
}  
}
```

Output:



```
cselab@cselab-desktop: ~  
cselab@cselab-desktop:~$ gedit readerwriter.c  
cselab@cselab-desktop:~$ gcc readerwriter.c -lpthread  
cselab@cselab-desktop:~$ ./a.out  
Data written by writer 0 is 1  
Data read by reader 0 is 1  
Data written by writer 1 is 2  
Data written by writer 2 is 3  
Data read by reader 1 is 3  
Data read by reader 2 is 3  
cselab@cselab-desktop:~$
```