Name : Nitin Parasram Andhale

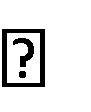
Div- 1

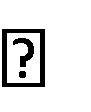
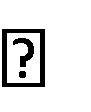
Roll no – I3111

ASSIGNMENTNO: 4 (B)

# THREAD SYNCHRONIZATION

AIM: Thread synchronization and mutual exclusion using mutex. Application to demonstrate: Reader Writer problem with reader priority.

OBJECTIVES : To study Semaphores Mutex Producer Consumer Problem



INPUT :

#include<stdio.h>

#include<unistd.h>

#include<semaphore.h>

#include<pthread.h>

#include<sys/syscall.h>

void \*reader(void \*argp); void \*writer(void \*argp); int buffer; int flag=0; int read\_count=0;

int getbuff() {

int temp; printf("Enter the no to add in buffer : "); scanf("%d",&temp);

return temp;

}

void readbuff(int buffer) {

printf("Element read by reader=%d\n",buffer);

}

pthread\_mutex\_t mutex1=PTHREAD\_MUTEX\_INITIALIZER; pthread\_mutex\_t wrt=PTHREAD\_MUTEX\_INITIALIZER;

int main() {

pthread\_t wtid1,rtid1,rtid2 ; pthread\_create(&wtid1,NULL,writer,NULL); pthread\_create(&rtid1,NULL,reader,NULL); pthread\_create(&rtid2,NULL,reader,NULL); pthread\_join(wtid1,NULL); pthread\_join(rtid1,NULL); pthread\_join(rtid2,NULL);

return 0; }

void\* writer(void \*argp) {

while(1) { pthread\_mutex\_lock(&wrt); if(flag==0) { buffer=getbuff(); flag=1; } pthread\_mutex\_unlock(&wrt);

}

}

void\* reader(void \*argp) {

while(1){ pthread\_mutex\_lock(&mutex1); read\_count++;

if(read\_count==1){ pthread\_mutex\_lock(&wrt);

} pthread\_mutex\_unlock(&mutex1);

if(flag==1){ readbuff(buffer); sleep(1); flag=0;

} pthread\_mutex\_lock(&mutex1); read\_count--;

if(read\_count==0) { pthread\_mutex\_unlock(&wrt);

} pthread\_mutex\_unlock(&mutex1);

}

}

OUTPUT :

pratik\_23@Pratik:/mnt/d/Operating System/Assignments/Final Assignments$ cc Assignment4B.c pthread pratik\_23@Pratik:/mnt/d/Operating System/Assignments/Final Assignments$ ./a.out

Enter the no to add in buffer : 1

Element read by reader=1

Element read by reader=1

Enter the no to add in buffer : 2

Element read by reader=2

Element read by reader=2

Enter the no to add in buffer : 3

Element read by reader=3

Element read by reader=3

Enter the no to add in buffer : 4

Element read by reader=4

Element read by reader=4

Enter the no to add in buffer : 5

Element read by reader=5

Element read by reader=5

Enter the no to add in buffer : 6

Element read by reader=6

Element read by reader=6

Enter the no to add in buffer : 7

Element read by reader=7

Element read by reader=7

Enter the no to add in buffer : 8

Element read by reader=8

Element read by reader=8

Enter the no to add in buffer : 9

Element read by reader=9

Element read by reader=9

Enter the no to add in buffer : 10

Element read by reader=10

Element read by reader=10

Enter the no to add in buffer :