**ASSIGNMENT NO. 5**

**THREAD SYNCHRONIZATION**

**Reader Writer Problem**

#include<stdio.h>

#include<pthread.h>

#include<stdlib.h>

#include<semaphore.h>

int readCount;

sem\_t s, mSem; //s as semaphore, mSem as mutex

void\* readerMethod(void\* data)

{

FILE\* fp;

char ch;

**do**

{

sem\_wait(&s);

readCount++;

if(readCount==1)

sem\_wait(&mSem);//writer shud wait

sem\_post(&s);//other readers can read.

fp=fopen("abc.txt", "r");

ch=fgetc(fp);

while(!feof(fp))

{

printf("%c",ch);

ch=fgetc(fp);

}

printf("\nReader Completed Execution!!\n");

fclose(fp);

??sem\_wait(&s);wait for reader

readCount--;

if(readCount==0)

sem\_post(&mSem);//writer can write

sem\_post(&s);//reader can read.

}while(readCount!=0);

}

void\* writerMethod(void\* data)

{

FILE \*fp;

char string[20];

sem\_wait(&mSem);

printf("\nEnter the Text: ");

scanf("%s", string);

fp=fopen("abc.txt", "a");

fprintf(fp, "%s", string);

fclose(fp);

printf("\nWriter Has Written!!\n");

sem\_post(&mSem);//reader can read.

}

int main()

{

int r, i, n;

FILE \*fp;

pthread\_t writer, reader[10];

sem\_init(&s, 0, 1);

sem\_init(&mSem, 0, 1);

printf("\nEnter The Number of Readers: ");

scanf("%d", &n);

fp=fopen("abc.txt","a");

fclose(fp);

readCount=0;

for(i=0;i<n;i++)

pthread\_create(&reader[i], NULL,readerMethod , NULL);

pthread\_create(&writer, NULL, writerMethod ,NULL);

for(i=0; i<n;i++)

pthread\_join(reader[i], NULL);

pthread\_join(writer, NULL);

return 0;

}

**OUTPUT**

[it@localhost ~]$ gcc ReaderWriter.c -lpthread

[it@localhost ~]$ ./a.out

Enter The Number of Readers: 6

Reader Completed Execution!!

Reader Completed Execution!!

Reader Completed Execution!!

Reader Completed Execution!!

Reader Completed Execution!!

Reader Completed Execution!!

Enter the Text: Hii..Hello..

Writer Has Written!!

[it@localhost ~]$ ./a.out

Enter The Number of Readers: 4

Hii..Hello..

Reader Completed Execution!!

Hii..Hello..

Reader Completed Execution!!

Hii..Hello..

Reader Completed Execution!!

Hii..Hello..

Reader Completed Execution!!

Enter the Text: Bye..

Writer Has Written!!

[it@localhost ~]$ ./a.out

Enter The Number of Readers: 5

Hii..Hello..Bye..

Reader Completed Execution!!

Hii..Hello..Bye..

Reader Completed Execution!!

Hii..Hello..Bye..

Reader Completed Execution!!

Hii..Hello..Bye..

Reader Completed Execution!!

Hii..Hello..Bye..

Reader Completed Execution!!

Enter the Text: Done..

Writer Has Written!!

[it@localhost ~]$