

PARALLEL AND DISTRIBUTED COMPUTING

L – 19,20

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Exercise :

Implement reader writer problem using openmp.

CODE :

```
#include<stdio.h>
#include <time.h>
#include <unistd.h>
#include <omp.h>

int main()
{
    int i=0,NumberOfReaderThread=0,NumberOfWriterThread;

    omp_lock_t writelock;
    omp_init_lock(&writelock);

    int readCount=0;

    printf("Enter number of Readers thread: ");
    scanf("%d",&NumberOfReaderThread);
    printf("Enter number of Writers thread: ");
    scanf("%d",&NumberOfWriterThread);

    int tid=0;
    #pragma omp parallel
    #pragma omp for

    for(i=0;i<NumberOfReaderThread;i++)
    {
        printf("Reader %d is trying to enter into the Database for reading the data\n",i);

        omp_set_lock(&writelock);
        readCount++;
        if(readCount==1)
        {
            printf("Reader %d is reading the database\n",i);
        }

        omp_unset_lock(&writelock);
        readCount--;
```

```

    if(readCount==0)
    {
        printf("Reader %d is leaving the database\n",i);
    }
}

#pragma omp parallel shared(tid)// Specifies that one or more variables should be shared among all
threads.
#pragma omp for nowait    //If there are multiple independent loops within a parallel region
for(i=0;i<NumberOfWriterThread;i++)
{
    printf("Writer %d is trying to enter into database for modifying the data\n",i);

    omp_set_lock(&writelock);

    printf("Writer %d is writting into the database\n",i);
    printf("Writer %d is leaving the database\n",i);

    omp_unset_lock(&writelock);
}

omp_destroy_lock(&writelock);
return 0;
}

```

OUTPUT:

```
[dhrubanka@dhrubanka-pc 17BCE1019_LAB8_PDC_12SEP]$ gcc -fopenmp readwrite.c && ./a.out
Enter number of Readers thread: 4
Enter number of Writers thread: 5
Reader 3 is trying to enter into the Database for reading the data
Reader 3 is reading the database
Reader 3 is leaving the database
Reader 2 is trying to enter into the Database for reading the data
Reader 2 is reading the database
Reader 2 is leaving the database
Reader 1 is trying to enter into the Database for reading the data
Reader 1 is reading the database
Reader 1 is leaving the database
Reader 0 is trying to enter into the Database for reading the data
Reader 0 is reading the database
Reader 0 is leaving the database
Writer 2 is trying to enter into database for modifying the data
Writer 2 is writting into the database
Writer 2 is leaving the database
Writer 4 is trying to enter into database for modifying the data
Writer 4 is writting into the database
Writer 4 is leaving the database
Writer 0 is trying to enter into database for modifying the data
Writer 0 is writting into the database
Writer 0 is leaving the database
Writer 1 is trying to enter into database for modifying the data
Writer 1 is writting into the database
Writer 1 is leaving the database
Writer 3 is trying to enter into database for modifying the data
Writer 3 is writting into the database
Writer 3 is leaving the database
```