Final Year B. Tech., Sem VI 2021-22

High Performance Computing Lab

Assignment submission

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Batch: B3

Assignment: 1

HPC LAB Assignment1
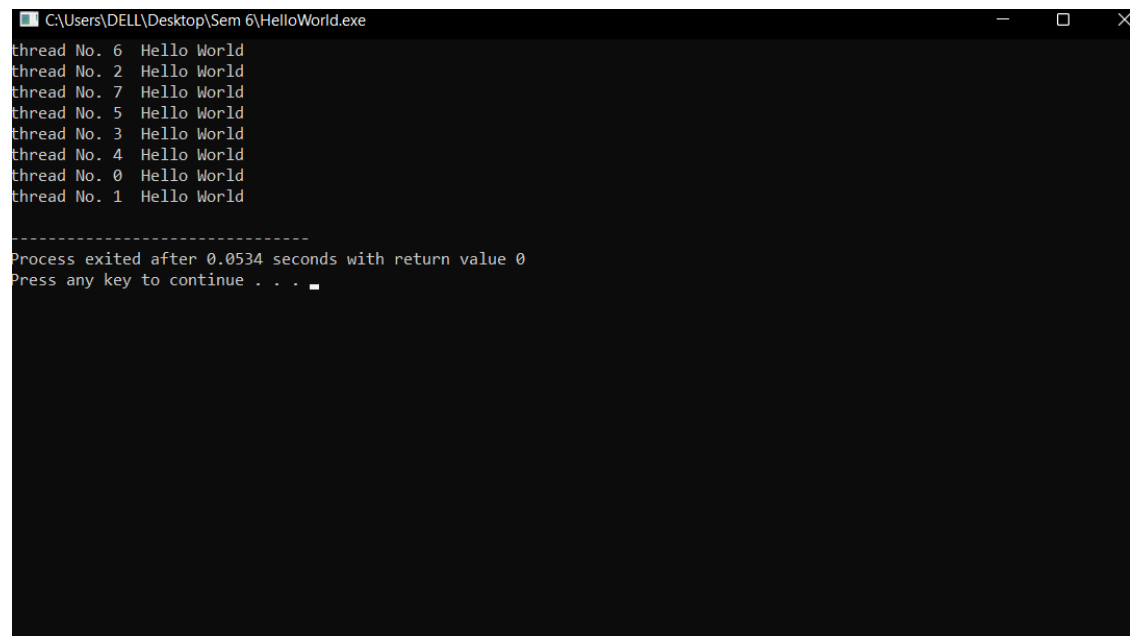
Q1.Hello world

Code:-

```
#include<omp.h>
#include<bits/stdc++.h>
int main(int argc, char* argv[]){

        #pragma omp parallel
        {
                printf("thread No. %d  Hello World\n", omp_get_thread_num());
        }
    return 0;
}
```

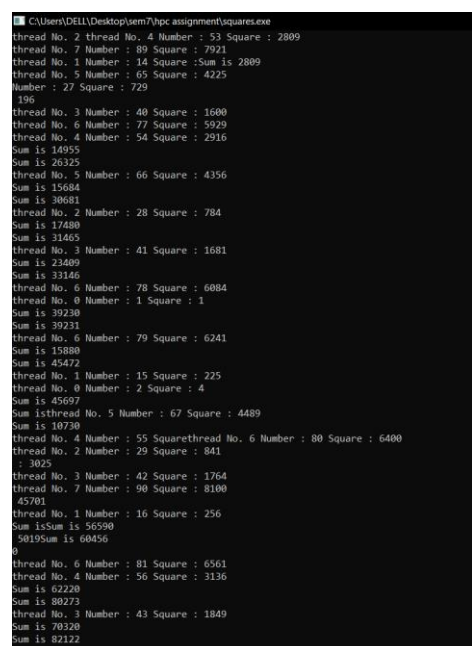Output:-

HPC LAB Assignment1

Q2.Squares

Code:-

```cpp
#include<omp.h>
#include<bits/stdc++.h>
using namespace std;
static int sum =0;
int main()
{
   #pragma omp parallel for
   for(int i=1; i<=100;i++)
   {
      printf("thread No. %d Number : %d Square : %d\n", omp_get_thread_num(), i, i * i);
      sum+=i*i;
      printf("Sum is %d \n",sum);
         }
   printf("%d",sum);
   return 0;
}
```

Output:-

HPC LAB Assignment1


```
C:\Users\DELL\Desktop\sem7\hpc assignment\squares.exe
thread No. 3 Number : 43 Square : 1849
Sum is 70320
Sum is 82122
thread No. 7 Number : 91 Square : 8281
Sum is 70576
Sum is 90403
thread No. 1 Number : 17 Square : 289
thread No. 3 Number : 44 Squathread No. 0 Number : 3 Square : 9
re : 1936
thread No. 7 Number : 92 Square : 8464
Sum is 90701
Sum is 101101
thread No. 5 Number : 68 Square : 4624
Sum is 77137
Sum is 105725
Sum is 90692
thread No. 5 Number Sum is 92637
: 69 Square : 4761
thread No. 7 Number : 93 Square : 8649
thread No. 6 Number : 82 Square : 6724
thread No. 4 Number : 57 Square : 3249
thread No. 1 Number : 18 Square : 324
Sum is 110486
Sum is 125859
thread No. 5 Number : 70 Square : 4900
Sum is 129108
thread No. 0 Number : 4 Square : 16
Sum is thread No. 4 Number : 58 Square : 3364
Sum is 57431
Sum is 137712
Sum is 119135
Sum is 134332
thread No. 7 Number :thread No. 2 Number : 30 Square : 900
129432
5thread No. 6 Number : 83 Square : 6889
thread No. 5 Number : 71 Square : 5041
thread No. 3 Number : 45 Square : 2025
thread No. 4 Number : 59 Square : 3481
um is 134348
Sum is 156048
Sum is 150542
 94 Square : 8836
Sum isthread No. 5 Number : 72 Square : 5184
thread No. 1 Number : 19 Square : 361
145501
Sum is 164884
Sum is 138612
Sum is 170068thread No. 6 Number : 84 Square : 7056
thread No. 4 Number : 60 Square : 3600
```



```
C:\Users\DELL\Desktop\sem7\hpc assignment\squares.exe
thread No. 7 Number : 95 Square : 9025
Sum is 170429
Sum is 152567

thread No. 2 Number : 31 Square : 961
Sum is Sum is 177485
Sum is 191071
thread No. 1 Number : 20 Square : 400
thread No. 5 Number : 73 Square : 5329
thread No. 2 Number : 32 Square : 1024Sum is 181085
Sum is 191471
thread No. 0 Number : 5 Square : 25
190110
threa
thread No. 4 Number : 61 Square : 3721
Sum is 196800
thread No. 3 Number : 46 Square : 2116
Sum is 196825
thread No. 7 Number : 96 Square : 9216
Sum is 197849
thread No. 1 Number : 21 Square : 441
Sum is 201570
thread No. 5 Number : 7thread No. 4 Number : 62 Square : 3844
Sum is 203686
threaSum is 212902
thread No. 2 Number : 33 Square : 1089
thread No. 3 Number : 47 Square : 2209
d No. 0 Number : 6 Square : 36
Sum is 218276
Sum is 213343
4 Square : 5476
Sum is 220485
thread No. 7 Number : 97 Square : 9409
thread No. 1 Number : 22 Square : 484
thread No. 3 Number : 48 Square : 2304
Sum is 238194
d No. 6 Number : 85 Square : 7225
Sum is 235406
thread No. 3 Number : 49 Square : 2401
Suthread No. 2 Number : 34 Square : 1156
Sum is 235890
thread No. 7 Number : 98 Square : 9604
Sum is 247820
m is 220521
Sum iSum is 225997
Sum is 248976
Sum is 217187
threas 258580
thread No. 4 Number : 63 Square : 3969
```

HPC LAB Assignment1

HPC LAB Assignment1

Parallel Vs Serial:-

Parallel Code:-

```
#include<omp.h>
#include<bits/stdc++.h>

int main(){
        long long sum = 0;

        double getInTime = omp_get_wtime();

        #pragma omp parallel for reduction(+ : sum)

        for(int i=1;i<=100000000;i++){
                sum += (i*i);
        }

        double getOutTime = omp_get_wtime();

        double exptTime = getOutTime - getInTime;


        printf("Time Required For Execution in Parallel : %f\n",exptTime);

        printf("Answer is : %lld",sum);

        return 0;

}
```

Serial Code:-

```
#include<bits/stdc++.h>
#include<omp.h>

int main(){

        long long sum = 0;

        double inTime = omp_get_wtime();


        int i;
        for(i=1;i<=100000000;i++){
                sum += (i*i);
        }
```
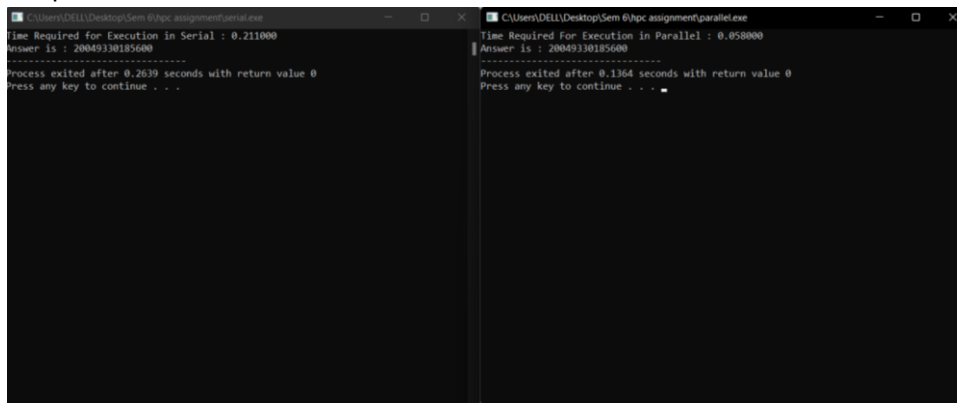
```
        double outTime = omp_get_wtime();

        double expcTime = outTime - inTime;

        printf("Time Required for Execution in Serial : %f\n",expcTime);
        printf("Answer is : %lld",sum);

        return 0;
}
```

Output:-