

HPC LAB

ASSIGNMENT NO.1

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Prn No.2019BTECS00097

Batch:B3

Q1) Write a program to print Hello World using OpenMp

code:

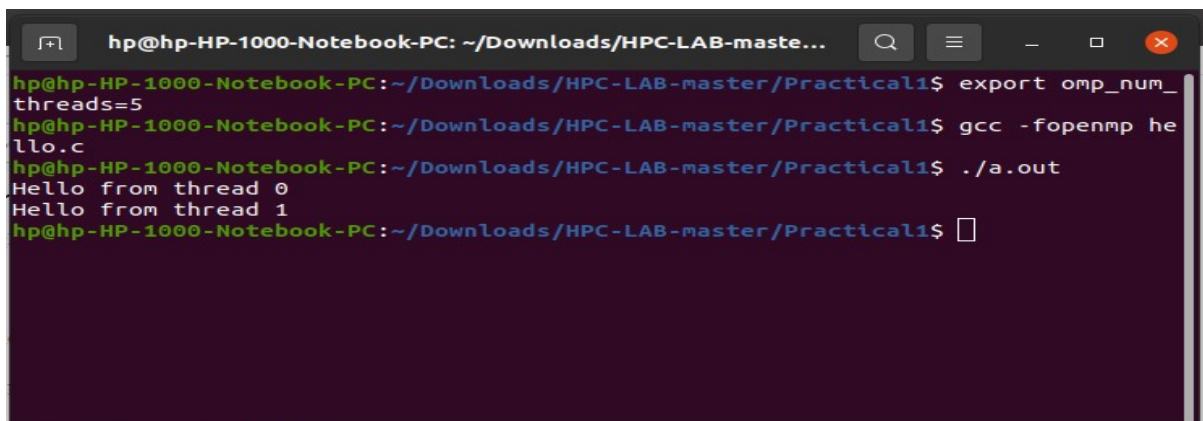
```
#include <stdio.h>
#include <omp.h>

int main()
{
    #pragma omp parallel
    {

        int ID = omp_get_thread_num();
        printf("Hello from thread %d\n",ID);

    }
    return 0;
}
```

output:



```
hp@hp-HP-1000-Notebook-PC: ~/Downloads/HPC-LAB-master/Practical1$ export omp_num_threads=5
hp@hp-HP-1000-Notebook-PC:~/Downloads/HPC-LAB-master/Practical1$ gcc -fopenmp hello.c
hp@hp-HP-1000-Notebook-PC:~/Downloads/HPC-LAB-master/Practical1$ ./a.out
Hello from thread 0
Hello from thread 1
hp@hp-HP-1000-Notebook-PC:~/Downloads/HPC-LAB-master/Practical1$
```

Q
2)

Write a program to print the sum of squares of numbers from 1 to hundred using OpenMp.

Code:

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

```

#include<stdlib.h>
#include<iostream>
using namespace std;
static int sum =0;
int main()
{
    #pragma omp parallel
    {

        for(int i=1; i<=100;i++)
        {
            if(i%4==omp_get_thread_num())
            {
                printf("thread No. %d Number : %d Square : %d\n", omp_get_thread_num(), i, i * i);
                sum+=i*i;
                printf("Sum is %d ",sum);
                cout<<endl;

            }
        }
    }
    return 0;
}

```

output:

Q3)
Write a

```

/home/hp/Documents/hpc_sq
thread No. 0 Number : 64 Square : 4096
Sum is 23936
thread No. 0 Number : 68 Square : 4624
Sum is 28560
thread No. 0 Number : 72 Square : 5184
Sum is 33744
thread No. 0 Number : 76 Square : 5776
Sum is 39520
thread No. 0 Number : 80 Square : 6400
Sum is 45920
thread No. 0 Number : 84 Square : 7056
Sum is 52976
thread No. 0 Number : 88 Square : 7744
Sum is 60720
thread No. 0 Number : 92 Square : 8464
Sum is 69184
thread No. 0 Number : 96 Square : 9216
Sum is 78400
thread No. 0 Number : 100 Square : 10000
Sum is 88400

Process returned 0 (0x0)   execution time : 0.006 s
Press ENTER to continue.

```

programme to calculate the 5th speedup in parallel and sequential execution

code: parallel execution

```

#include<omp.h>
#include<stdio.h>
#include<stdlib.h>
#include<bits/stdc++.h>
using namespace std;

```

```

int main(){
    long long sum = 0;

    double getInTime = omp_get_wtime();

    #pragma omp parallel for reduction(+ : sum)

    for(int i=1;i<=1000000000;i++){
        sum += (i*i);
    }

    double getOutTime = omp_get_wtime();

    double exptTime = getOutTime - getInTime;

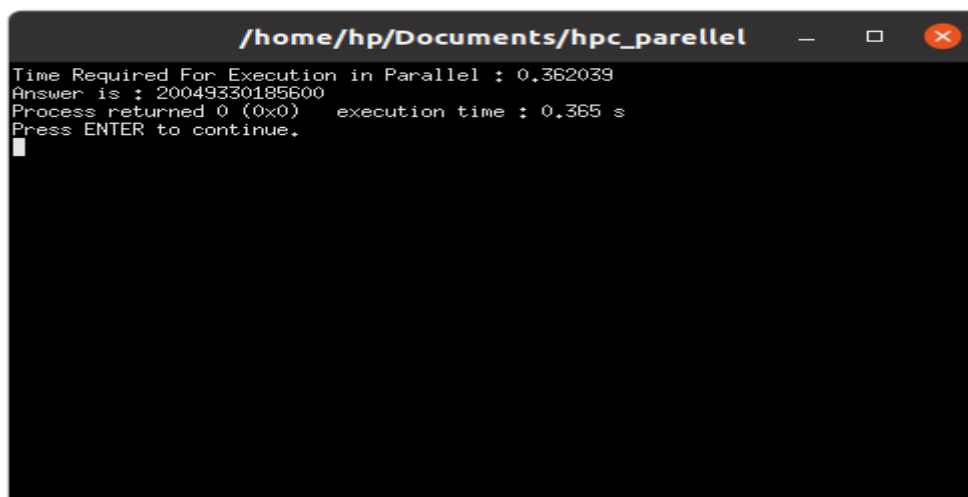
    printf("Time Required For Execution in Parallel : %f\n",exptTime);

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

    return 0;
}

```

output:



The screenshot shows a terminal window with the title bar `/home/hp/Documents/hpc_parellel`. The output displayed is:

```

Time Required For Execution in Parallel : 0.362039
Answer is : 20049330185600
Process returned 0 (0x0)   execution time : 0.365 s
Press ENTER to continue.

```

code Sequential Execution:

```

#include<omp.h>
#include<stdio.h>
#include<stdlib.h>
#include<bits/stdc++.h>
using namespace std;

```

```

int main(){

    long long sum = 0;

    double inTime = omp_get_wtime();

    int i;
    for(i=1;i<=1000000000;i++){
        sum += (i*i);
    }

    double outTime = omp_get_wtime();

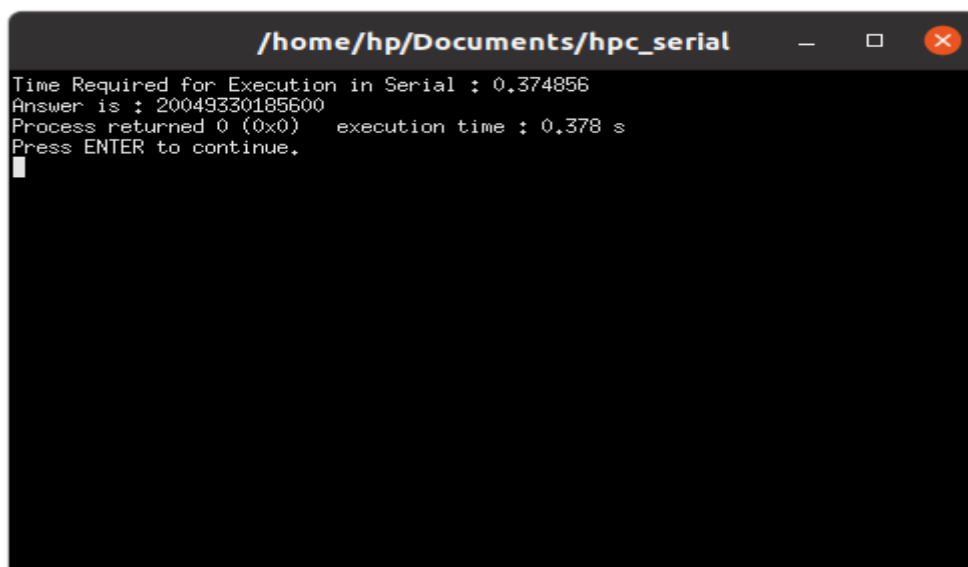
    double expcTime = outTime - inTime;

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

    return 0;
}

```

output:



```

/home/hp/Documents/hpc_serial
Time Required for Execution in Serial : 0.374856
Answer is : 20049330185600
Process returned 0 (0x0) execution time : 0.378 s
Press ENTER to continue.

```

Hence ,

since speedup=sequential execution / parallel execution

so

$$=0.37486/0.362039$$

$$=1.03541331183$$