CSE4001-PARALLEL AND DISTRIBUTED COMPUTING

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Lab Ex: 5

1.Finding the prime numbers in the given range:(for 2^1 to 2^17)

Algorithm:

- We use a simple sieve algorithm to find the prime numbers in a given range.
- We run a loop for 1-5 threads ; each time we set the number of threads from 1-5 and run the function to find the number of prime numbers within the range.
- Start the clock before setting the thread to the corresponding number and close the clock after printing the count value.

Code:

```
#include<stdio.h>
#include<omp.h>
#include<stdlib.h>
#include<limits.h>
#include<time.h>
int main()
{
   int prime[1000000];
   long long i, j, n;
   clock_t start,end;
   double cpu_time_used;
     printf("\nEnter the value of n");
   scanf("%lld",&n);
   for(int k=0;k<5;k++)
```

```
{
 start=clock();
 omp_set_num_threads(k+1);


for(i=1;i<=n;i++)
{
    prime[i]=1;
}
prime[1]=0;
for(i=2;i*i<=n;i++)
{


        #pragma omp parallel for
        for(j=i*i;j<=n;j=j+i)
          {
             if(prime[j]==1)
                  prime[j]=0;
          }

}

int count = 0;
for(i=2;i<=n;i++)
{
    if(prime[i] == 1)
    {

        count ++;
    }
}
printf("%d\n", count);

end=clock();
```

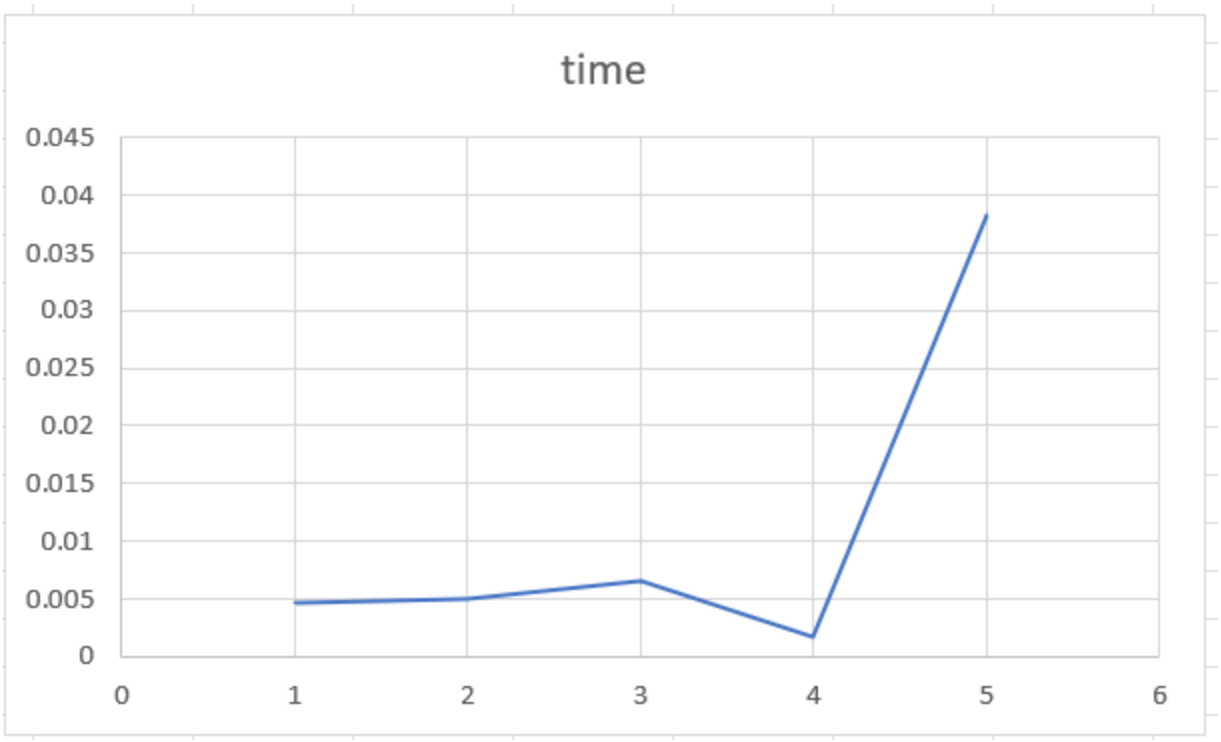
```
    cpu_time_used=((double)(end-start))/CLOCKS_PER_SEC;
    printf("Execution Time is:%lf for %d threads\n",cpu_time_used,k+1);
    }
}
```

Output:

```
Enter the value of n 131072
12251
Execution Time is:0.004724 for 1 threads
12251
Execution Time is:0.005071 for 2 threads
12251
Execution Time is:0.006595 for 3 threads
12251
Execution Time is:0.001666 for 4 threads
12251
Execution Time is:0.038366 for 5 threads
```

Graph:

n=131072	
No of threads	time
1	0.004724
2	0.005071
3	0.006595
4	0.001666
5	0.038366


time
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0
1
2
3
4
5
6