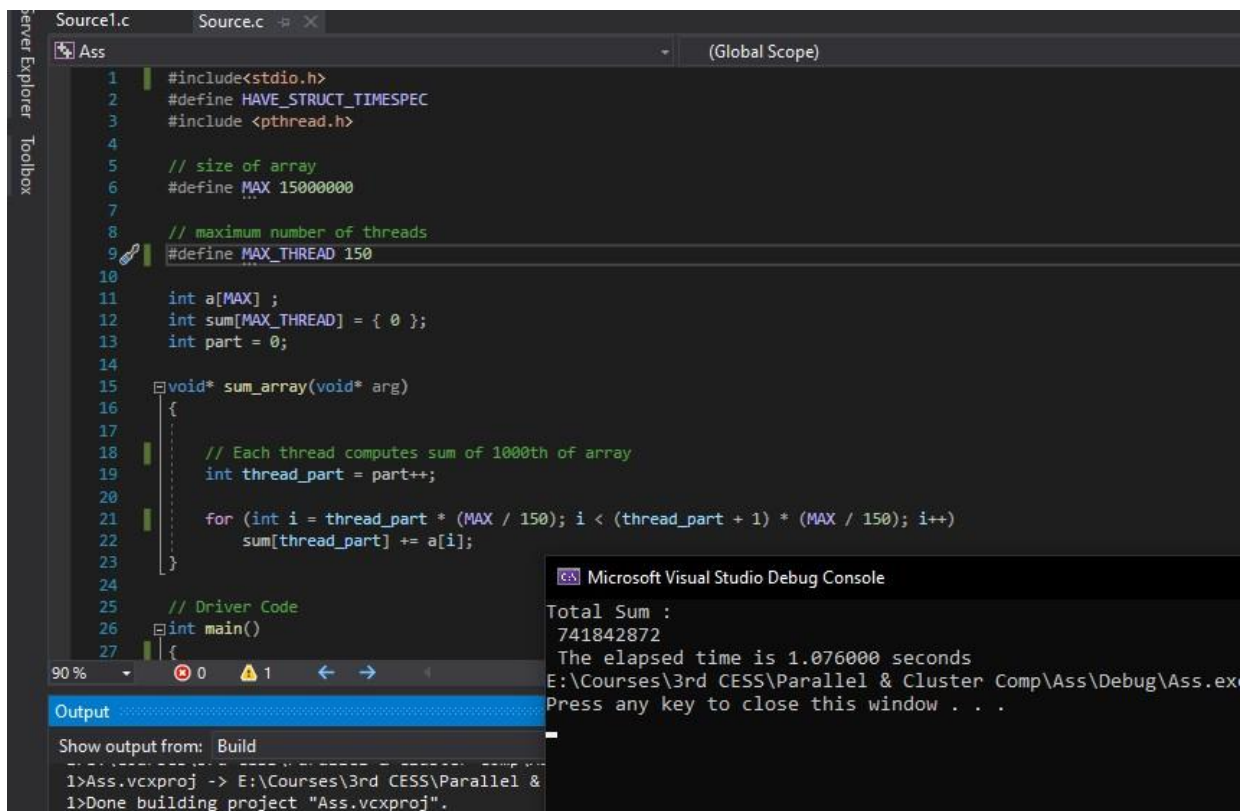


Ass.1

Pthreads Method execution time:



The screenshot displays a Visual Studio IDE with a C source file named 'Source1.c'. The code implements a parallel sum calculation using pthreads. It defines a large array 'a' of size 'MAX' (15000000) and a maximum number of threads 'MAX_THREAD' (150). The 'sum_array' function is a thread routine that calculates a portion of the array sum. The 'main' function creates and joins 150 threads to compute the total sum of the array. The debug console shows the execution results: a total sum of 741842872 and an elapsed time of 1.076000 seconds.

```
1  #include<stdio.h>
2  #define HAVE_STRUCT_TIMESPEC
3  #include <pthread.h>
4
5  // size of array
6  #define MAX 15000000
7
8  // maximum number of threads
9  #define MAX_THREAD 150
10
11 int a[MAX] ;
12 int sum[MAX_THREAD] = { 0 };
13 int part = 0;
14
15 void* sum_array(void* arg)
16 {
17     // Each thread computes sum of 1000th of array
18     int thread_part = part++;
19
20     for (int i = thread_part * (MAX / 150); i < (thread_part + 1) * (MAX / 150); i++)
21         sum[thread_part] += a[i];
22 }
23
24 // Driver Code
25 int main()
26 {
27     // ... (thread creation and joining logic) ...
28 }
```

Microsoft Visual Studio Debug Console

```
Total Sum :
741842872
The elapsed time is 1.076000 seconds
E:\Courses\3rd CESS\Parallel & Cluster Comp\Ass\Debug\Ass.exe
Press any key to close this window . . .
```

Output

```
Show output from: Build
1>Ass.vcxproj -> E:\Courses\3rd CESS\Parallel & Cluster Comp\Ass\Debug\Ass.exe
1>Done building project "Ass.vcxproj".
```

Drive Link Contains Code:

<https://drive.google.com/file/d/1pKIT87twggWma6kfBKqmFJ7DNUJ2kobh/view?usp=sharing>

Sequential Method execution time:

```
1  #include<stdio.h>
2  #define HAVE_STRUCT_TIMESPEC
3  #include <pthread.h>
4
5  // size of array
6  #define MAX 15000000
7  int a[MAX];
8
9  int main()
10 {
11     double time_spent = 0.0;
12
13     clock_t begin = clock();
14
15     for (int i = 0; i < MAX; i++)
16         a[i] = rand() % 100;
17
18     int sum = 0;
19     for (int i = 0; i < MAX; i++)
20     {
21         sum += a[i];
22     }
23     printf("Total Sum : \n ");
24     printf("%d", sum);
25
26     clock_t end = clock();
27
28     time_spent += (double)(end - begin) /

```

Microsoft Visual Studio Debug Console

Total Sum :
741842872
The elapsed time is 1.098000 seconds
E:\Courses\3rd CESS\Parallel & Cluster Comp\Ass\
Press any key to close this window . . .

Output

Show output from: Build