Assignment 2A

```
!nvcc --version
%env OMP_NUM_THREADS=3
```

```
nvcc: NVIDIA (R) Cuda compiler driver
Copyright (c) 2005-2023 NVIDIA Corporation
Built on Tue_Aug_15_22:02:13_PDT_2023
Cuda compilation tools, release 12.2, V12.2.140
Build cuda_12.2.r12.2/compiler.33191640_0
env: OMP_NUM_THREADS=3
```

```
%%writefile bubble.cpp

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

void swap(int *num1, int *num2);

int main (int argc, char *argv[]) {
  int SIZE =1<<8;
  int A[SIZE];
  for(int i=0;i<SIZE;i++)
  {
      A[i]=rand()%SIZE;
  }
  //int A[5] = {6,9,1,3,7};
  int N = SIZE;
  int i=0, j=0;
  int first;
  double start,end;
  start=omp_get_wtime();
  for( i = 0; i < N-1; i++ )
  {
    first = i % 2;
    #pragma omp parallel for default(none),shared(A,first,N)
    for( j = first; j < N-1; j += 1 )
    {
      if( A[ j ] > A[ j+1 ] )
      {
        swap( &A[ j ], &A[ j+1 ] );
      }
    }
  }
end=omp_get_wtime();
  for(i=0;i<N;i++)
  {
    printf(" %d",A[i]);
  }

printf("\n-------------------------\n Time Parallel= %f",(end-start));
}

void swap(int *num1, int *num2)
{

  int temp = *num1;
  *num1 =  *num2;
  *num2 = temp;
}
```

```
Overwriting bubble.cpp
```

```
!g++ bubble.cpp -o bubble -fopenmp
```

```
!./bubble
```

```
 0 1 2 4 5 5 5 5 9 11 11 13 14 15 16 17 17 19 20 21 21 23 24 25 26 26 26 27 27 27 28 28 30 31 33 33 34 35 35 36 37 41 41
-------------------------
 Time Parallel= 0.006731
```