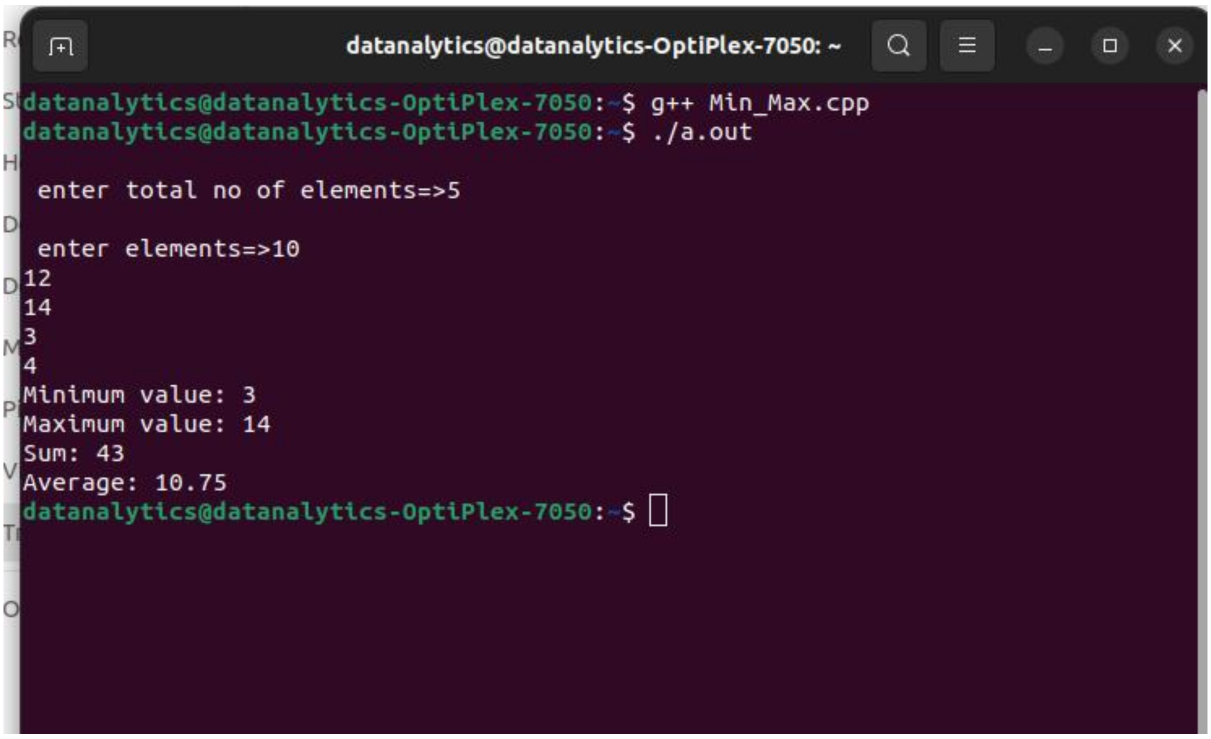
Experiment No: 3. Implement Min, Max, Sum and Average operations using Parallel Reduction.

```
#include <iostream>

//#include <vector>

#include <omp.h>

#include <climits>

using namespace std;

void min_reduction(int arr[], int n) {

 int min_value = INT_MAX;

 #pragma omp parallel for reduction(min: min_value)

 for (int i = 0; i < n; i++) {

 if (arr[i] < min_value) {

   min_value = arr[i];

 }

 }

 cout << "Minimum value: " << min_value << endl;

}


void max_reduction(int arr[], int n) {

 int max_value = INT_MIN;

 #pragma omp parallel for reduction(max: max_value)

 for (int i = 0; i < n; i++) {

 if (arr[i] > max_value) {

   max_value = arr[i];

 }

 }

 cout << "Maximum value: " << max_value << endl;
```

```
}

void sum_reduction(int arr[], int n) {
  int sum = 0;
   #pragma omp parallel for reduction(+: sum)
   for (int i = 0; i < n; i++) {
  sum += arr[i];
  }
  cout << "Sum: " << sum << endl;
}

void average_reduction(int arr[], int n) {
  int sum = 0;
  #pragma omp parallel for reduction(+: sum)
  for (int i = 0; i < n; i++) {
  sum += arr[i];
  }
  cout << "Average: " << (double)sum / (n-1) << endl;
}

int main() {
    int *arr,n;
    cout<<"\n enter total no of elements=>";
    cin>>n;
    arr=new int[n];
    cout<<"\n enter elements=>";
    for(int i=0;i<n;i++)
    {
```

```
    cin>>arr[i];
   }

//   int arr[] = {5, 2, 9, 1, 7, 6, 8, 3, 4};
//   int n = size(arr);

  min_reduction(arr, n);
  max_reduction(arr, n);
  sum_reduction(arr, n);
  average_reduction(arr, n);
}
```

Output:



datanalytics@datanalytics-OptiPlex-7050: ~

```
datanalytics@datanalytics-OptiPlex-7050:~$ g++ Min_Max.cpp
datanalytics@datanalytics-OptiPlex-7050:~$ ./a.out

 enter total no of elements=>5

 enter elements=>10
12
14
3
4
Minimum value: 3
Maximum value: 14
Sum: 43
Average: 10.75
datanalytics@datanalytics-OptiPlex-7050:~$ 
```