High Performance Computing : Assignment 3

Title:- Implement Min, Max, Sum and Average operations using Parallel Reduction.

```cpp
#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=>";
```

```cpp
    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:-
enter total no of elements=>5
enter elements=>34
12
56
44
67
Minimum value: 12
Maximum value: 67
Sum: 213
Average: 53.25