# Assignment No. 3

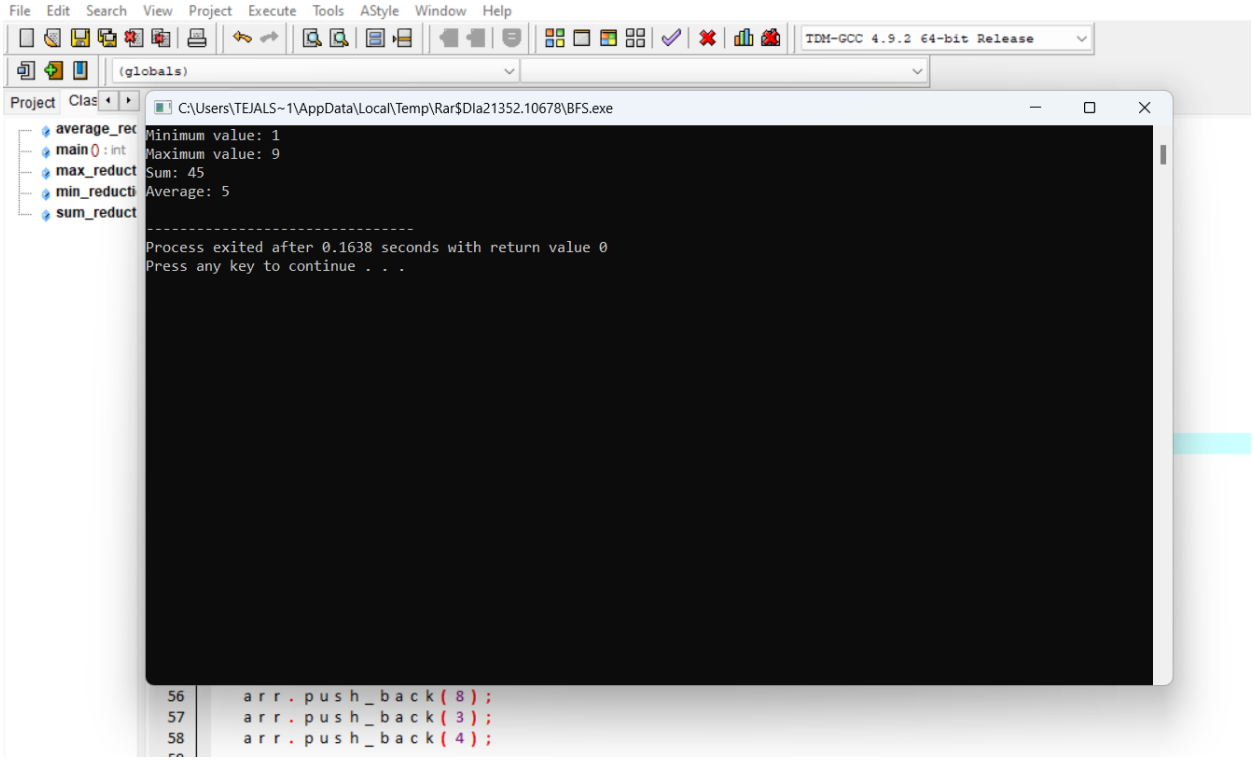
## Min, Max, Sum and Average operations using Parallel Reduction

Code -

```
#include <iostream>
#include <vector>
#include <omp.h>
#include <climits>

using namespace std;

void min_reduction(vector<int>& arr) {
  int min_value = INT_MAX;
  #pragma omp parallel for reduction(min: min_value)
  for (int i = 0; i < arr.size(); i++) {
    if (arr[i] < min_value) {
      min_value = arr[i];
    }
  }
  cout << "Minimum value: " << min_value << endl;
}

void max_reduction(vector<int>& arr) {
  int max_value = INT_MIN;
  #pragma omp parallel for reduction(max: max_value)
  for (int i = 0; i < arr.size(); i++) {
    if (arr[i] > max_value) {
      max_value = arr[i];
    }
  }
  cout << "Maximum value: " << max_value << endl;
}

void sum_reduction(vector<int>& arr) {
  int sum = 0;
   #pragma omp parallel for reduction(+: sum)
   for (int i = 0; i < arr.size(); i++) {
    sum += arr[i];
  }
  cout << "Sum: " << sum << endl;
}
```

```
void average_reduction(vector<int>& arr) {
  int sum = 0;
  #pragma omp parallel for reduction(+: sum)
  for (int i = 0; i < arr.size(); i++) {
    sum += arr[i];
  }
  cout << "Average: " << (double)sum / arr.size() << endl;
}

int main() {
  vector<int> arr;
  arr.push_back(5);
  arr.push_back(2);
  arr.push_back(9);
  arr.push_back(1);
  arr.push_back(7);
  arr.push_back(6);
  arr.push_back(8);
  arr.push_back(3);
  arr.push_back(4);

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

Output -


File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project
average_rec
main () : int
max_reduct
min_reducti
sum_reduct
C:\Users\TEJALS~1\AppData\Local\Temp\Rar$DIa21352.10678\BFS.exe
Minimum value: 1
Maximum value: 9
Sum: 45
Average: 5
--------------------------------
Process exited after 0.1638 seconds with return value 0
Press any key to continue . . .
arr.push_back(8);
arr.push_back(3);
arr.push_back(4);