

## ASSIGNMENT NO . 3

**Name: Kshitija Sakhare**

**Class: BE(B2)**

**Roll No.: B212040**

### PARALLEL REDUCTION.

```
#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:

```
Minimum value: 1
Maximum value: 9
Sum: 45
Average: 5
```