

Assignment 3

The image displays two screenshots of the Programiz C++ Online Compiler, showing the implementation of parallel reduction functions using OpenMP.

Top Screenshot: The code defines three reduction functions: `min_reduction`, `max_reduction`, and `sum_reduction`. The `main` function calls these functions with an array of 5 elements. The output shows the minimum value (2), maximum value (25), and sum (72), with an average of 18.

```
1 //Cedrick Andrade
2 //COBA006
3
4 #include <iostream>
5 #include <omp.h>
6 #include <climits>
7 using namespace std;
8 void min_reduction(int arr[], int n) {
9     int min_value = INT_MAX;
10    #pragma omp parallel for reduction(min: min_value)
11    for (int i = 0; i < n; i++) {
12        if (arr[i] < min_value) {
13            min_value = arr[i];
14        }
15    }
16    cout << "Minimum value: " << min_value << endl;
17 }
18
19 void max_reduction(int arr[], int n) {
20     int max_value = INT_MIN;
21     #pragma omp parallel for reduction(max: max_value)
22     for (int i = 0; i < n; i++) {
23         if (arr[i] > max_value) {
24             max_value = arr[i];
25         }
26     }
27     cout << "Maximum value: " << max_value << endl;
28 }
29
30 void sum_reduction(int arr[], int n) {
31     int sum = 0;
32     #pragma omp parallel for reduction(+: sum)
33     for (int i = 0; i < n; i++) {
34         sum += arr[i];
35     }
36 }
```

Bottom Screenshot: The code defines two reduction functions: `sum_reduction` and `average_reduction`. The `main` function calls these functions with an array of 5 elements. The output shows the sum (72) and average (18).

```
29
30 void sum_reduction(int arr[], int n) {
31     int sum = 0;
32     #pragma omp parallel for reduction(+: sum)
33     for (int i = 0; i < n; i++) {
34         sum += arr[i];
35     }
36     cout << "Sum: " << sum << endl;
37 }
38
39 void average_reduction(int arr[], int n) {
40     int sum = 0;
41     #pragma omp parallel for reduction(+: sum)
42     for (int i = 0; i < n; i++) {
43         sum += arr[i];
44     }
45     cout << "Average: " << (double)sum / (n-1) << endl;
46 }
47
48 int main() {
49     int arr[n];
50     cout << "Enter total no of elements>> ";
51     cin >> n;
52     arr = new int[n];
53     cout << "Enter elements>> ";
54     for (int i = 0; i < n; i++) {
55         cin >> arr[i];
56     }
57 }
58
59 min_reduction(arr, n);
60 max_reduction(arr, n);
61 sum_reduction(arr, n);
62 average_reduction(arr, n);
63 }
```