

Name : Nikhil Khade

Roll No. : COBA14

Lab : HPC 3 (a)

Input :

```
#include <iostream>

#include <vector>

#include <omp.h>

using namespace std;

int parallelMin(vector<int> vec) {
    int min_val = vec[0];
    #pragma omp parallel for
    for (int i = 1; i < vec.size(); i++) {
        if (vec[i] < min_val) {
            min_val = vec[i];
        }
    }
    return min_val;
}

int parallelMax(vector<int> vec) {
    int max_val = vec[0];
    #pragma omp parallel for
    for (int i = 1; i < vec.size(); i++) {
        if (vec[i] > max_val) {
            max_val = vec[i];
        }
    }
    return max_val;
}

int parallelSum(vector<int> vec) {
```

```
int sum = 0;

#pragma omp parallel for
for (int i = 0; i < vec.size(); i++) {
    sum += vec[i];
}

return sum;
}
```

```
float parallelAverage(vector<int> vec) {
    int sum = parallelSum(vec);
    float avg = float(sum) / vec.size();
    return avg;
}
```

```
int main() {
    int n;
    cout << "Enter the number of elements: ";
    cin >> n;

    vector<int> vec(n);
    cout << "Enter the elements: ";
    for (int i = 0; i < n; ++i) {
        cin >> vec[i];
    }

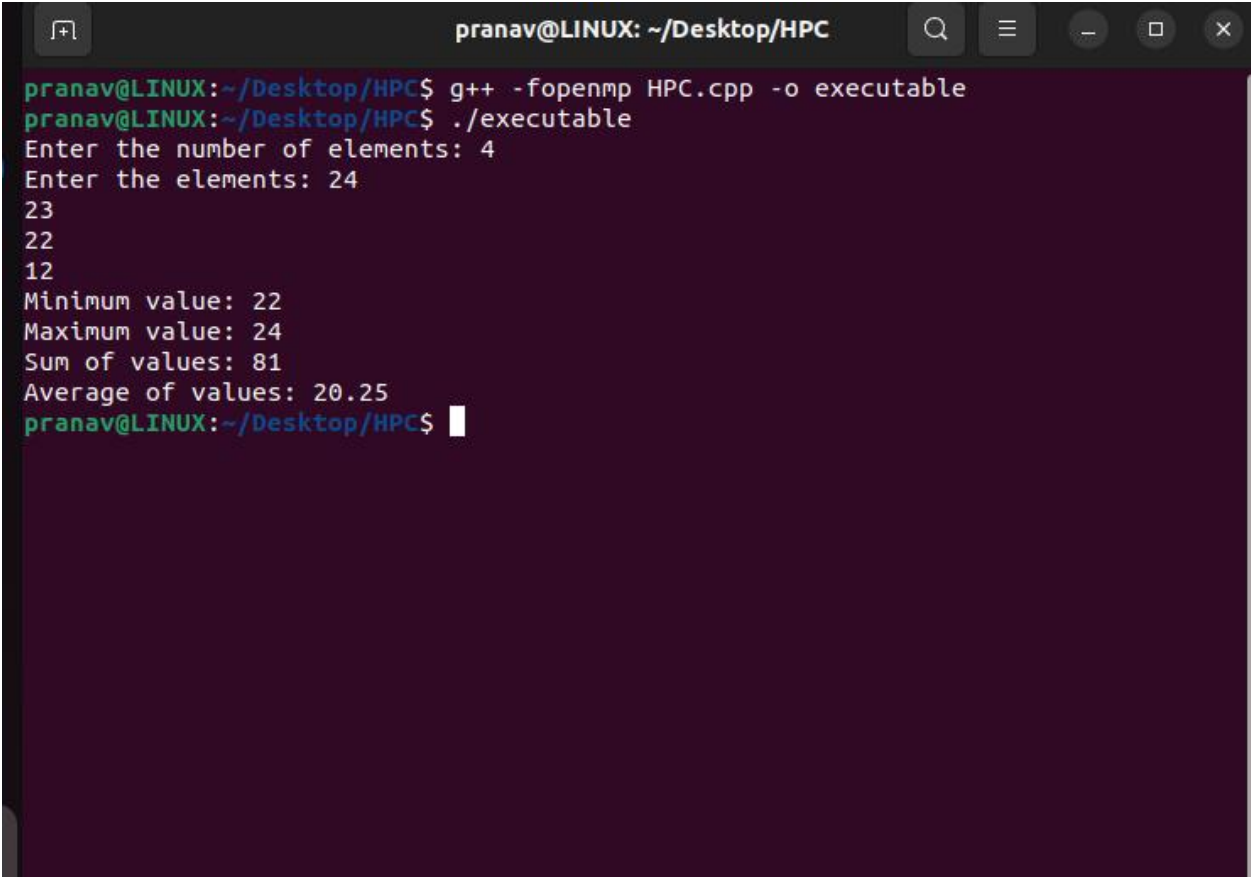
    int min_val = parallelMin(vec);
    cout << "Minimum value: " << min_val << endl;

    int max_val = parallelMax(vec);
    cout << "Maximum value: " << max_val << endl;

    int sum = parallelSum(vec);
    cout << "Sum of values: " << sum << endl;
```

```
float avg = parallelAverage(vec);  
  
cout << "Average of values: " << avg << endl;  
  
return 0;  
}
```

Output :



```
pranav@LINUX: ~/Desktop/HPC  
pranav@LINUX:~/Desktop/HPC$ g++ -fopenmp HPC.cpp -o executable  
pranav@LINUX:~/Desktop/HPC$ ./executable  
Enter the number of elements: 4  
Enter the elements: 24  
23  
22  
12  
Minimum value: 22  
Maximum value: 24  
Sum of values: 81  
Average of values: 20.25  
pranav@LINUX:~/Desktop/HPC$
```

The image shows a terminal window titled "pranav@LINUX: ~/Desktop/HPC". The user enters the command `g++ -fopenmp HPC.cpp -o executable` to compile the program. Then, they run `./executable`. The program prompts for the number of elements (4) and the elements themselves (24, 23, 22, 12). It then outputs the minimum value (22), maximum value (24), sum of values (81), and the average of values (20.25). The prompt returns to the user.