Fundamentals of Programming

Submitted to:
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Lab Manual 10

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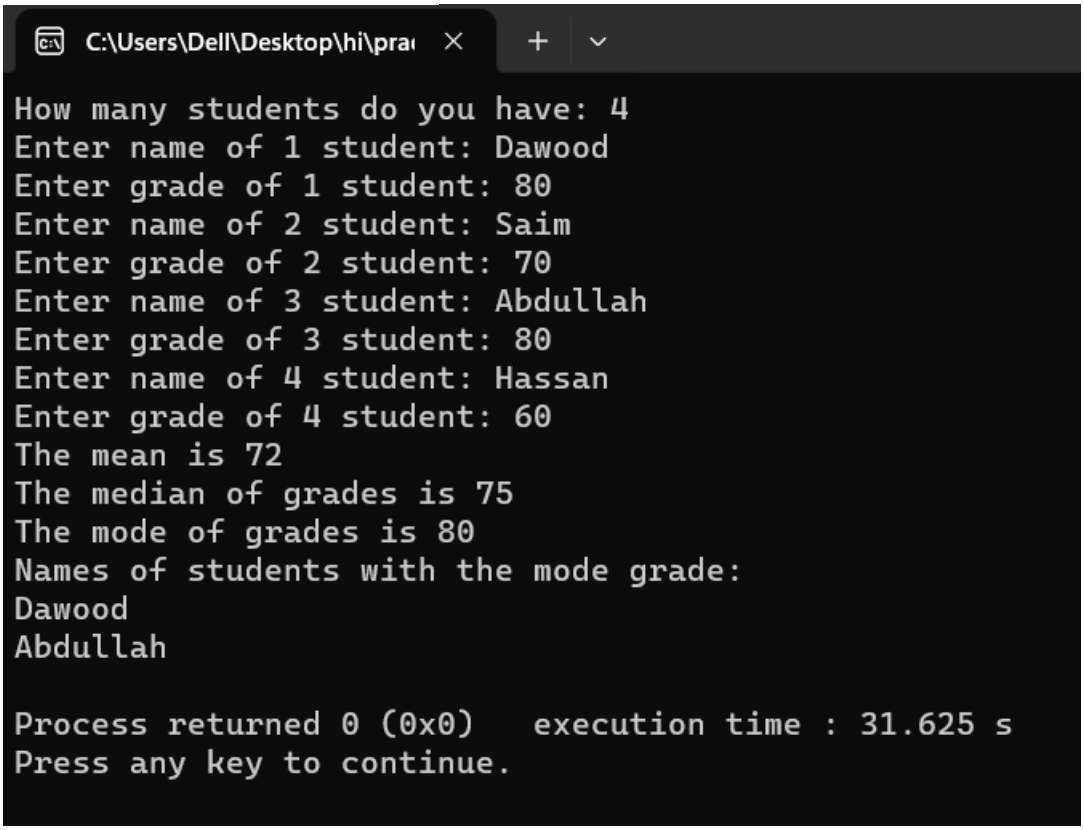
```cpp
//Iterate Through Vector Using Iterators and print all pushed elements. Next you need to push integer 5 and remove element at that position.

#include <bits/stdc++.h>

using namespace std;

int main() {
    vector<int> numbers;

    cout << "Enter numbers to be added" << endl;
    for (int i = 0; i < 5; i++) {
        int num;
        cin >> num;
        numbers.push_back(num);
    }

    cout << endl;

    for (int i = 0; i < 5; i++) {
        cout << numbers[i] << " ";
    }

    cout << endl;

    numbers.push_back(5);

    for (int i = 0; i < numbers.size(); i++) {
        cout << numbers[i] << " ";
    }

    cout << endl;

    numbers.erase(numbers.begin() + 5);

    for (int i = 0; i < numbers.size(); i++) {
        cout << numbers[i] << " ";
    }

    return 0;
}
```

```
C:\Users\Dell\Desktop\hi\pra
Enter numbers to be added
1
4
2
5
3

1 4 2 5 3
1 4 2 5 3 5
1 4 2 5 3
Process returned 0 (0x0)   execution time : 4.900 s
Press any key to continue.
```

```cpp
#include <bits/stdc++.h>
using namespace std;

int main() {
    vector<string> studentNames;
    vector<int> studentGrades;

    int numberOfStudents;
    cout << "How many students do you have: ";
    cin >> numberOfStudents;

    int totalGrades = 0;

    for (int i = 0; i < numberOfStudents; i++) {
        string name;
        cout << "Enter name of " << i + 1 << " student: ";
        cin >> name;
        studentNames.push_back(name);

        int grade;
        cout << "Enter grade of " << i + 1 << " student: ";
        cin >> grade;
        studentGrades.push_back(grade);
        totalGrades += grade;
    }

    int mean = totalGrades / numberOfStudents;
    cout << "The mean is " << mean << endl;

    if (numberOfStudents % 2 == 0) {
        int middleIndex = numberOfStudents / 2;
        int median = (studentGrades[middleIndex] + studentGrades[middleIndex - 1]) / 2;
        cout << "The median of grades is " << median << endl;
    } else {
        int middleIndex = numberOfStudents / 2;
        cout << "The median of grades is " << studentGrades[middleIndex] << endl;
    }

    int modeCount = 0;
    int modeValue = studentGrades[0];
    int currentCount = 1;

    for (int i = 1; i < numberOfStudents; i++) {
        if (studentGrades[i] == studentGrades[i - 1]) {
            currentCount++;
        } else {
            if (currentCount > modeCount) {
                modeCount = currentCount;
                modeValue = studentGrades[i - 1];
            }
            currentCount = 1;
        }
    }

    if (currentCount > modeCount) {
        modeCount = currentCount;
        modeValue = studentGrades[numberOfStudents - 1];
    }

    cout << "The mode of grades is " << modeValue << endl;
    cout << "Names of students with the mode grade:" << endl;

    for (int i = 0; i < numberOfStudents; i++) {
        if (studentGrades[i] == modeValue) {
            cout << studentNames[i] << endl;
```

```
        }
    }

    return 0;
}
```


C:\Users\Dell\Desktop\hi\pra
How many students do you have: 4
Enter name of 1 student: Dawood
Enter grade of 1 student: 80
Enter name of 2 student: Saim
Enter grade of 2 student: 70
Enter name of 3 student: Abdullah
Enter grade of 3 student: 80
Enter name of 4 student: Hassan
Enter grade of 4 student: 60
The mean is 72
The median of grades is 75
The mode of grades is 80
Names of students with the mode grade:
Dawood
Abdullah
Process returned 0 (0x0)   execution time : 31.625 s
Press any key to continue.