

Fundamentals of Programming

Submitted to:
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Lab Manual 10

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```

//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\Devi\Desktop\hi\prai >
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.

```

```

#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;
        }
    }

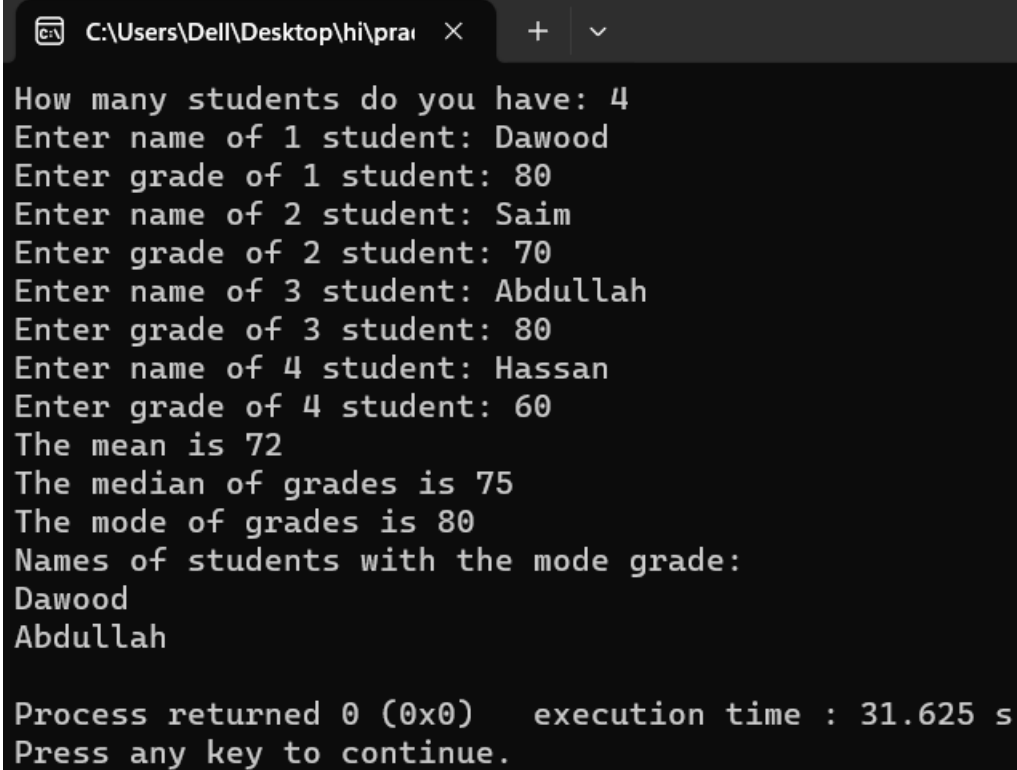
    if (currentCount > modeCount) {
        modeCount = currentCount;
        modeValue = studentGrades[numberOfStudents - 1];
    }

    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;  
}
```



The screenshot shows a Windows command prompt window with a dark background. The title bar at the top indicates the file path 'C:\Users\Dell\Desktop\hi\prai'. The program prompts the user for the number of students (4), then for the name and grade of each student. The input names are Dawood, Saim, Abdullah, and Hassan, with grades 80, 70, 80, and 60 respectively. The program then calculates and displays the mean (72), median (75), and mode (80) of the grades. It also lists the names of students with the mode grade (80), which are Dawood and Abdullah. At the bottom, it shows 'Process returned 0 (0x0)' and 'execution time : 31.625 s', followed by the instruction 'Press any key to continue.'.

```
C:\Users\Dell\Desktop\hi\prai X + v  
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.
```