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

```cpp
using namespace std;

int main()
{
    vector <int> vl;
    vl.push_back(10);
    vl.push_back(11);
    vl.push_back(12);
    vl.push_back(13);
    vl.push_back(14);
    for(int i=0;i<vl.size() ;i++){
       cout<<vl[i]<<endl;


    }
    vl.insert(vl.begin()+3,5);
    vl.erase(vl.begin()+4);
     for(int i=0;i<vl.size() ;i++){
       cout<<vl[i]<<endl;


    }



    cout << "Hello world!" << endl;
    return 0;
}
```

```
10
11
12
13
14
10
11
12
5
14
Hello world!

Process returned 0 (0x0)   execution time : 0.021 s
Press any key to continue.
```

2 Write a complete C++ program that uses 2 vectors, 1 for names (string) and 1 for grades (int)

a. Ask the user for the number of name/grade pairs that will be entered.
b. Display the mean of the grades.
c. Display the median of the grades.
d. Display the mode of the grades.
e. Display the names of the students with the mode as their grade.

```cpp
#include <iostream>
#include <unordered_map>
#include <vector>
#include <algorithm>

using namespace std;

int main() {
    int input, grade, sum = 0, mean, median = 0;
    string name;
    vector<int> grades;
    vector<string> names;

    cout << "How many name grade pairs do you want?" << endl;
    cin >> input;

    for (int i = 0; i < input; ++i) {
        cout << "Enter the name of the student" << endl;
        cin >> name;
        names.push_back(name);

        cout << "Enter the grade of the student" << endl;
        cin >> grade;
        grades.push_back(grade);
    }

    for (int i = 0; i < grades.size(); ++i) {
        sum += grades[i];
    }

    mean = sum / grades.size();
    cout << "The mean grade is: " << mean << endl;
    sort(grades.begin(), grades.end());
```

```
    size_t middleIndex = grades.size() / 2;

    if (grades.size() % 2 == 0) {
        median = (grades[middleIndex - 1] + grades[middleIndex]) / 2;
    } else {
        median = grades[middleIndex];
    }
out << "Median of the grades: " << median << endl;
nt maxFrequency = 0;
    vector<int> modeGrades;

    for (int i = 0; i < grades.size(); ++i) {
        int frequency = 0;
        for (int j = 0; j < grades.size(); ++j) {
            if (grades[j] == grades[i])
                frequency++;
        }
        if (frequency > maxFrequency) {
            maxFrequency = frequency;
            modeGrades.clear();
            modeGrades.push_back(grades[i]);
        } else if (frequency == maxFrequency && find(modeGrades.begin(), modeGrades.end(), grades[i]) == modeGrades.end()) {
            modeGrades.push_back(grades[i]);
        }
    }

    cout << "Mode(s) of the grades: ";
    for (int grade : modeGrades) cout << grade << " ";
    cout << endl;
    cout << "Names of students with mode grade: ";
    for (int i = 0; i < grades.size(); ++i) {
        if (find(modeGrades.begin(), modeGrades.end(), grades[i]) != modeGrades.end()) {
            cout << names[i] << " ";
        }
```

```
C:\Users\LENOVO\Documents\labmanual10\bin\Debug\labmanual10.exe
How many name grade pairs do you want?
3
Enter the name of the student
ahmed
Enter the grade of the student
8
Enter the name of the student
ali
Enter the grade of the student
9
Enter the name of the student
faizan
Enter the grade of the student
10
The mean grade is: 9
Median of the grades: 9
Mode(s) of the grades: 8 9 10
Names of students with mode grade: ahmed ali faizan

Process returned 0 (0x0)   execution time : 17.396 s
Press any key to continue.
```