NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF MECHANICAL AND MANUFACTURING ENGINEERING

CS-114 - Fundamental of Programing

LAB MANUAL # 10

ME -15 (C)

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

CODE:

```
#include<bits/stdc++.h>
using namespace std;
int main(){
	vector<int>vip;
	cout<<"Enter numbers to be added\n";
	for(int i=0;i<5;i++){
		int n;
		cin>>n;
		vip.push_back(n);
	}
	cout<<endl;
	for(int i=0;i<5;i++){
		cout<<vip[i]<<" ";
	}
	cout<<endl;
	vip.push_back(5);
		for(int i=0;i<vip.size();i++){
		cout<<vip[i]<<" ";
	}
	cout<<endl;
	vip.erase(vip.begin()+5);
		for(int i=0;i<vip.size();i++){
		cout<<vip[i]<<" ";
	}
	return 0;

}
```

RESULT:

```
Enter numbers to be added
1
4
7
8
9

1 4 7 8 9
1 4 7 8 9 5
After replacing number or erasing it the vector is: 1 4 7 8 9
--------------------------------
Process exited after 8.264 seconds with return value 0
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.**

Display the names of the students with the mode as their grade

CODE:

```
#include <bits/stdc++.h>

using namespace std;

int main() {
   vector<string> name;
   vector<int> grad;
   int num;

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

   int sum = 0;

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

      int grade;
      cout << "Enter grade of " << i + 1 << " student: ";
      cin >> grade;
      grad.push_back(grade); // Add the grade to the vector

      sum = sum + grade;
   }

   int mean = sum / num;
```

```
    cout << "The mean is " << mean << endl;


    if (num % 2 == 0) {
        int y = num / 2;
        int med = (grad[y] + grad[y - 1]) / 2; // Correct the median calculation
        cout << "The median of grades is " << med << endl;
    } else {
        int x = num / 2;
        cout << "The median of grades is " << grad[x] << endl;
    }

    // Calculate mode
    int modeCount = 0;
    int modeValue = grad[0];
    int currentCount = 1;

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

    if (currentCount > modeCount) {
        modeCount = currentCount;
        modeValue = grad[num - 1];
    }

    cout << "The mode of grades is " << modeValue  << endl;

cout << "Names of students with the mode grade:" << endl;
for (int i = 0; i < num; i++) {
    if (grad[i] == modeValue) {
        cout << name[i] << endl;
    }
}


    return 0;
}
```

RESULT:

```
How many students do you have: 4
Enter name of 1 student: Hashir
Enter grade of 1 student: 76
Enter name of 2 student: Ali
Enter grade of 2 student: 90
Enter name of 3 student: Haider
Enter grade of 3 student: 80
Enter name of 4 student: Ashir
Enter grade of 4 student: 80
The mean is 81
The median of grades is 85
The mode of grades is 80
Names of students with the mode grade:
Haider
Ashir
```