NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

CS-114- FUNDAMENTAL OF PROGRAMMING

LAB MANUAL 10

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SECTION: C

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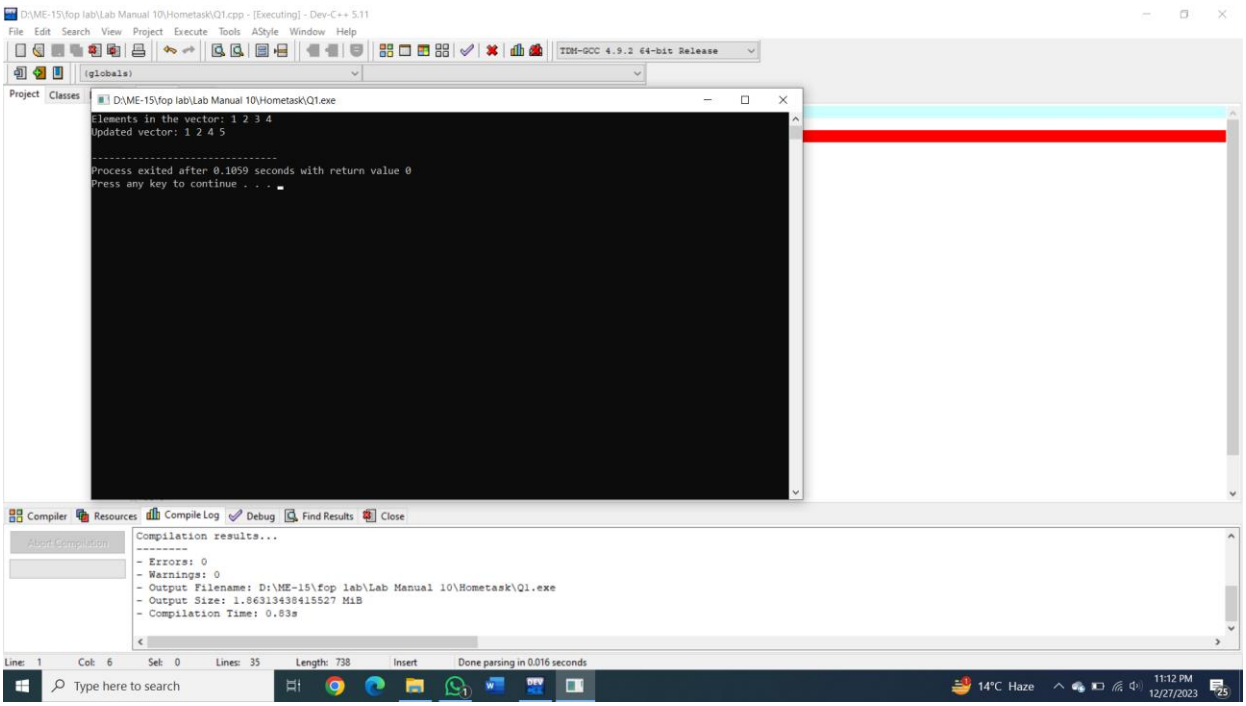
Q1

```
#include <iostream>
#include <vector>

using namespace std;

int main() {

vector<int> push;

push.push_back(1);
push.push_back(2);
push.push_back(3);
push.push_back(4);

cout << "Elements in the vector: ";
for (vector<int>::iterator it = push.begin(); it != push.end(); ++it) {
cout << *it << " ";
}
cout << endl;

push.push_back(5);

if (!push.empty() && push.size() > 2) {
vector<int>::iterator itToRemove = push.begin() + 2;
push.erase(itToRemove);
}

cout << "Updated vector: ";
for (vector<int>::iterator it = push.begin(); it != push.end(); ++it) {
cout << *it << " ";
}
cout<<endl;

return 0;
}
```



Q2

```
#include <iostream>
#include <vector>
#include <map>

using namespace std;

int main() {

int num;
cout << "Enter the number of name/grade pairs: ";
cin >> num;

vector<string> names;
vector<int> grades;

for (int i = 0; i < num; ++i) {
string name;
int grade;

cout << "Enter name for student " << i + 1 << "  ";
```

```
cin >> name;

cout << "Enter grade for student " << i + 1 << "  ";
cin >> grade;

names.push_back(name);
grades.push_back(grade);
}

int sum = 0;
for(int i = 0; i < grades.size(); ++i) {
sum += grades[i];
}
double mean = sum / static_cast<double>(num);
cout << "Mean of the grades: " << mean << endl;

double median;
if (num % 2 == 0) {
median = (grades[num / 2 - 1] + grades[num / 2]) / 2.0;
} else {
median = grades[num / 2];
}
cout << "Median of the grades: " << median << endl;

map<int, int> gradeFrequency;
for (int i = 0; i < grades.size(); ++i) {
gradeFrequency[grades[i]]++;
}

int mode = -1;
int maxFrequency = 0;

for (map<int, int>::iterator it = gradeFrequency.begin(); it != gradeFrequency.end(); ++it) {
if (it->second > maxFrequency) {
mode = it->first;
maxFrequency = it->second;
}
}
```

```
cout << "Mode of the grades: " << mode << endl;
cout << "Students with the mode as their grade:" << endl;

for (size_t i = 0; i < grades.size(); ++i) {
if (grades[i] == mode) {
cout << names[i] << endl;
}
}

return 0;
}
```