Lab manual 10

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ME-15(A)

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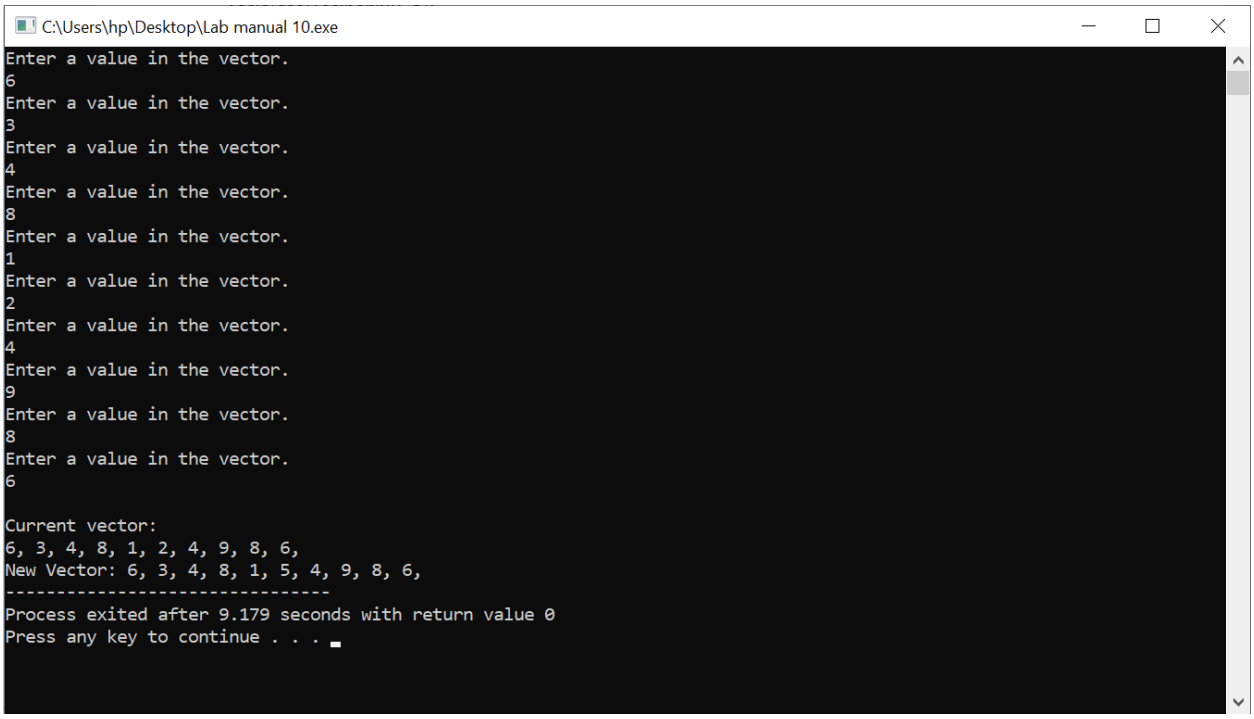
1. **Iterate Through Vector Using Iterators and print all pushed elements. Next you need to push integer 5 and remove element at that position.**

```
int num, i;
vector<int> vec;
for(i=0; i<10; i++){
        cout<<"Enter a value in the vector.\n";
        cin>>num;
        vec.push_back(num);
}
cout<<endl<<"Current vector: \n";
for(i=0; i<10; i++)
{
        cout<<vec.at(i)<<", ";
}

vec.erase(vec.begin()+5);
vec.insert(vec.begin()+5, 5);
cout<<endl<<"New Vector: ";
for(i=0; i<10; i++)
{
        cout<<vec.at(i)<<", ";
```

}


C:\Users\hp\Desktop\Lab manual 10.exe
Enter a value in the vector.
6
Enter a value in the vector.
3
Enter a value in the vector.
4
Enter a value in the vector.
8
Enter a value in the vector.
1
Enter a value in the vector.
2
Enter a value in the vector.
4
Enter a value in the vector.
9
Enter a value in the vector.
8
Enter a value in the vector.
6
Current vector:
6, 3, 4, 8, 1, 2, 4, 9, 8, 6,
New Vector: 6, 3, 4, 8, 1, 5, 4, 9, 8, 6,
Process exited after 9.179 seconds with return value 0
Press any key to continue . . .

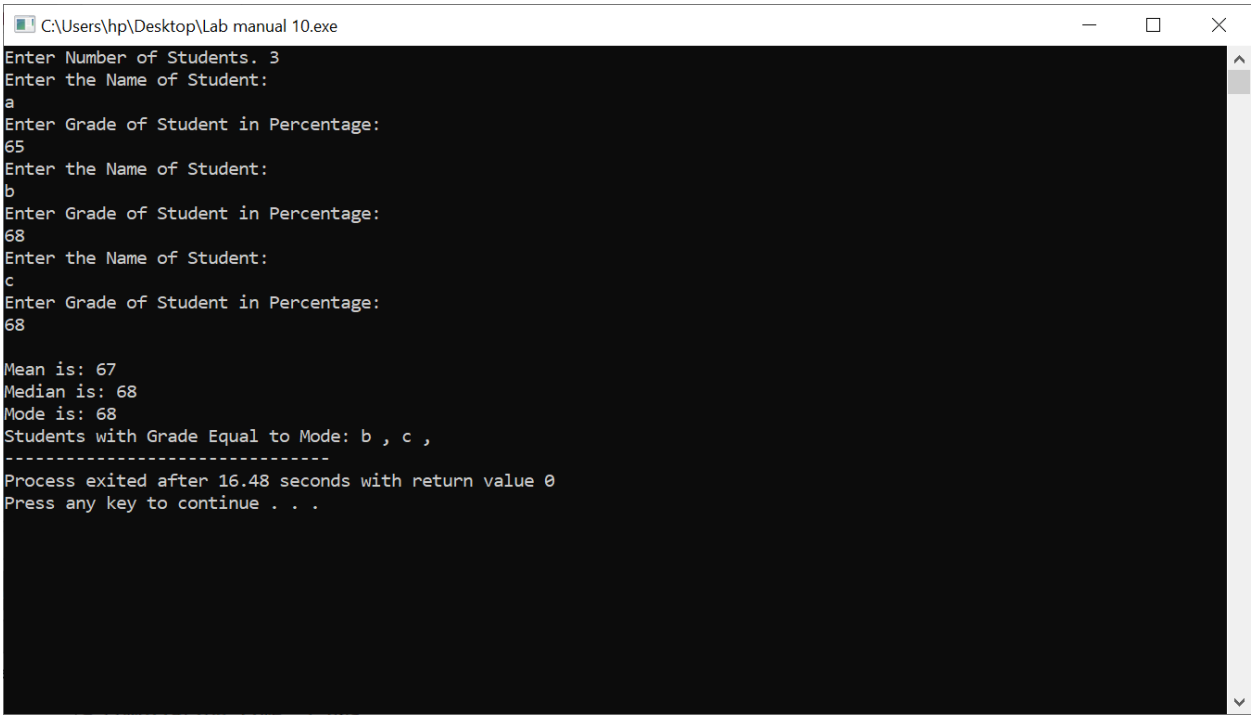
2. **Write a complete C++ program that uses 2 vectors, 1 for names (string) and 1 for grades (int)**
    a. **Ask the user for the number of name/grade pairs that will be entered.**
    b. **Display the mean of the grades.**
    c. **Display the median of the grades.**
    d. **Display the mode of the grades.**
    e. **Display the names of the students with the mode as their grade.**

```
int mean(vector<int> vec){
        int sum=0, size=vec.size();
        for(int i=0; i<vec.size(); i++){
                sum=vec[i]+sum;
        }
        int mean=sum/vec.size();

        return mean;
}
int median(vector<int> vec){
        int i, j, temp, median;
        for(i=0; i<vec.size()-1; i++){
                for(j=0; j<vec.size()-1; j++){
                        if(vec[j]>vec[j+1]){
                                temp=vec[j];
                                vec[j]=vec[j+1];
                                vec[j+1]=temp;
                        }
                }
        }
        int n=vec.size();
        if(n%2 == 0){
                median=((n/2)+((n/2)+1))/2;
```

```
	}
	else{
		median=(n+1)/2;

	}

	return vec[median-1]	;
}

int mode(vector<int> vec){
	int repetition=0, maxrep=0, mostrepeated;
	for(int i=0; i<vec.size(); i++){
		repetition=0;
		for(int j=0; j<vec.size(); j++){
			if(vec[i]==vec[j]){
				repetition++;
			}
		}
		if(repetition>maxrep){
			maxrep=repetition;
			mostrepeated=vec[i];
		}
	}
	return mostrepeated;
}

void students_mode(vector<string> vec, vector<int> vec2, int mode){
	int i=0;
	cout<<"Students with Grade Equal to Mode: ";
```

```
	for(i=0; i<vec.size(); i++){
		if(vec2[i]==mode){
			cout<<vec[i]<<" , ";
		}
	}
}
int main(){
	vector<string> names;
	vector<int> grades;
	int i,j,input,num,Mean,Median,Mode;
	string name;
	cout<<"Enter Number of Students. ";
	cin>>num;
	for(i=0; i<num; i++){
		cout<<"Enter the Name of Student: ";
		cin>>name;
		names.push_back(name);
		cout<<endl<<"Enter Grade of Student in Percentage: ";
		cin>>input;
		grades.push_back(input);
		}
	system("cls");
	Mean=mean(grades);
	cout<<endl<<"Mean is: "<<Mean<<endl;
	Median=median(grades);
	cout<<"Median is: "<<Median<<endl;
	Mode=mode(grades);
	cout<<"Mode is: "<<Mode<<endl;
	students_mode(names, grades, Mode);
```

```
}
```

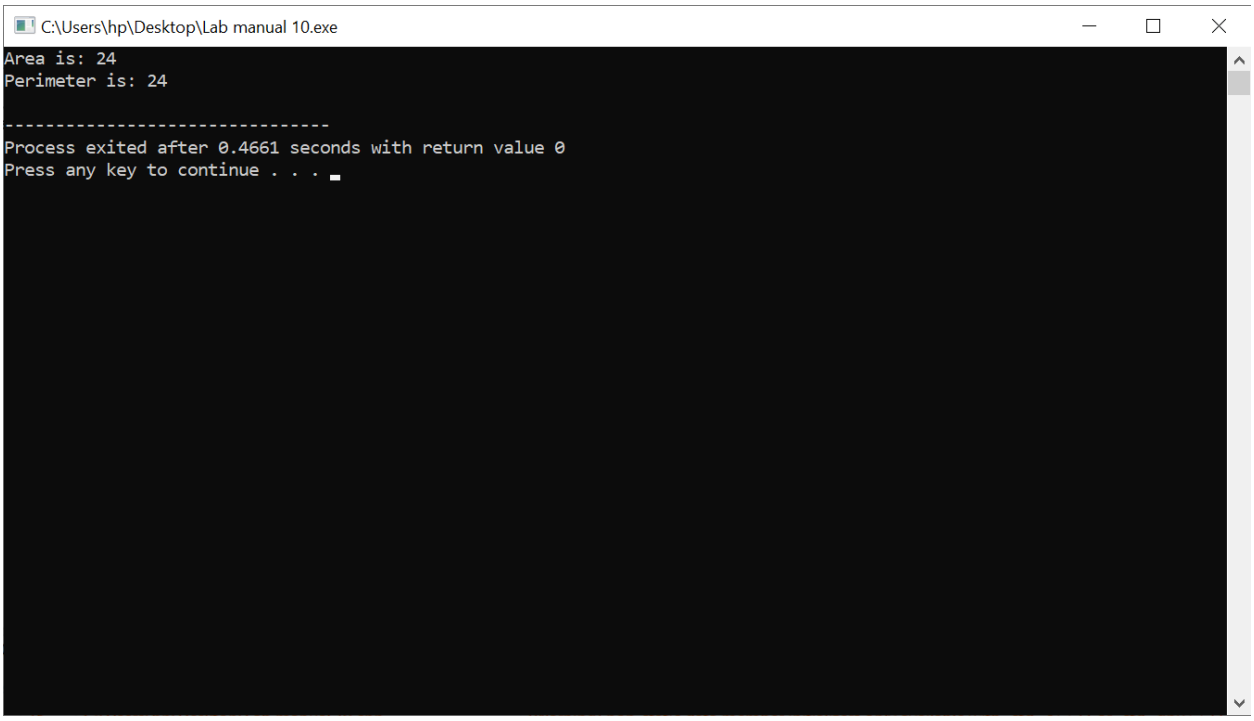

C:\Users\hp\Desktop\Lab manual 10.exe
Enter Number of Students. 3
Enter the Name of Student:
a
Enter Grade of Student in Percentage:
65
Enter the Name of Student:
b
Enter Grade of Student in Percentage:
68
Enter the Name of Student:
c
Enter Grade of Student in Percentage:
68
Mean is: 67
Median is: 68
Mode is: 68
Students with Grade Equal to Mode: b , c ,

Process exited after 16.48 seconds with return value 0
Press any key to continue . . .

3. **Write a program to print the area and perimeter of a triangle having sides of 3 m, 4 m and 5 m by creating a class named 'Triangle' with a function to print the area and perimeter.**

```
class triangle{
	public:
		int length1=6;
		int length2=8;
		int length3=10;

	int perimeter(){
		return length1+length2+length3;

	}
	double area(){
		int area,m;
		m=perimeter()/2;
		return sqrt(m * (m - length1) * (m - length2) * (m - length3));
	}
};
int main(){
triangle tri;
	int perimeter;
	double area;
	perimeter=tri.perimeter();
	area=tri.area();

	cout<<"Area is: "<<area<<endl;
	cout<<"Perimeter is: "<<perimeter<<endl;
```

}

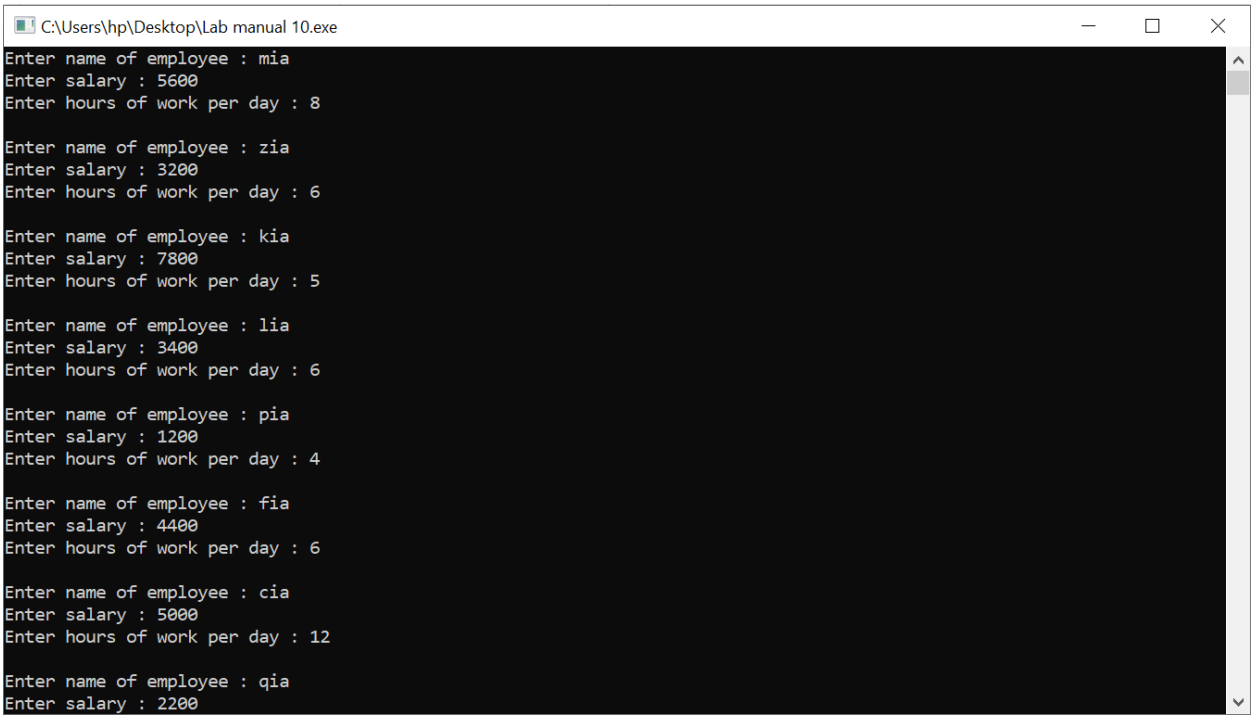

C:\Users\hp\Desktop\Lab manual 10.exe
Area is: 24
Perimeter is: 24

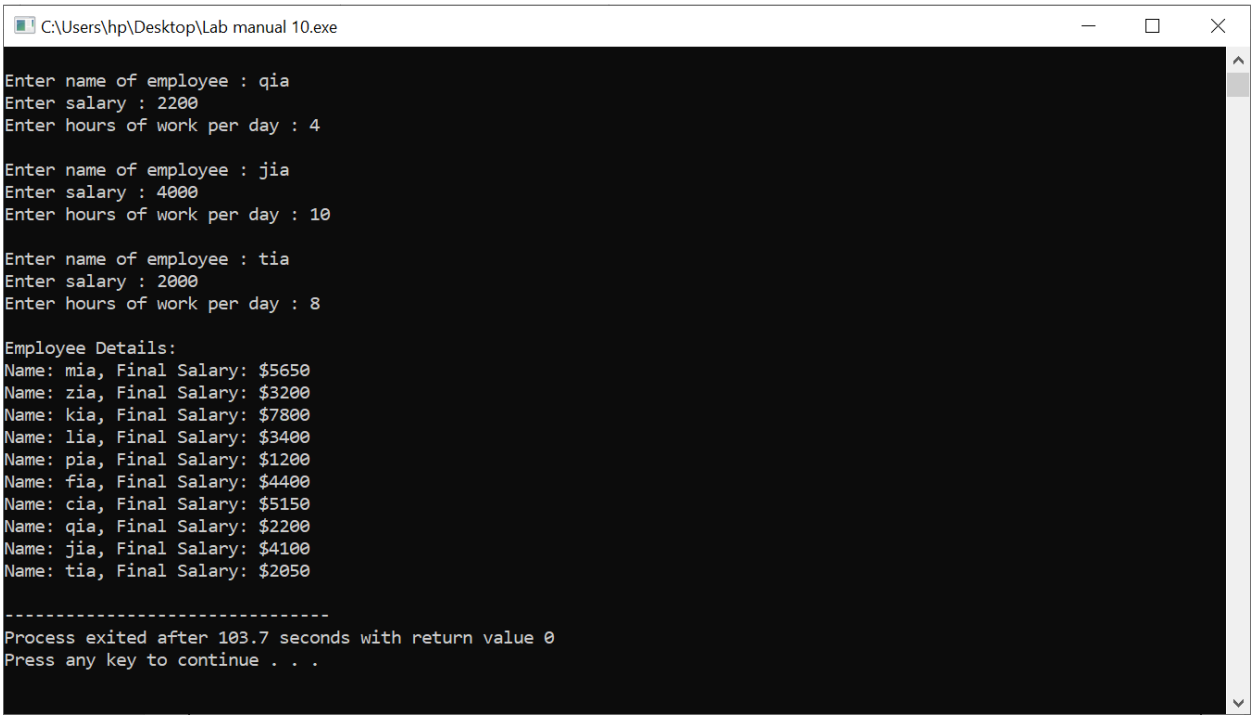
Process exited after 0.4661 seconds with return value 0
Press any key to continue . . .

4. **Write a structure to store the names, salary, and hours of work per day of 10 employees in a company. Write a program to increase the salary depending on the number of hours of work per day as follows and then print the name of all the employees along with their final salaries.**

```
struct Employee {
   string name;
   double salary;
   int hoursperday;
};
int main(){
        const int no_employees = 10;
   Employee employees[no_employees];

   for (int i = 0; i < no_employees; ++i) {
      cout << "Enter name of employee " <<": ";
      cin >> employees[i].name;

      cout << "Enter salary " << ": ";
      cin >> employees[i].salary;

      cout << "Enter hours of work per day " << ": ";
      cin >> employees[i].hoursperday;

      cout << endl;
   }

   for (int i = 0; i < no_employees; ++i) {
      if (employees[i].hoursperday >= 12) {
```

```
            employees[i].salary += 150;
        } else if (employees[i].hoursperday >= 10) {
            employees[i].salary += 100;
        } else if (employees[i].hoursperday >= 8) {
            employees[i].salary += 50;
        }
    }

    cout << "Employee Details:" << endl;
    for (int i = 0; i < no_employees; ++i) {
        cout << "Name: " << employees[i].name << ", Final Salary: $" << employees[i].salary << endl;
    }
}
```




C:\Users\hp\Desktop\Lab manual 10.exe
Enter name of employee : qia
Enter salary : 2200
Enter hours of work per day : 4
Enter name of employee : jia
Enter salary : 4000
Enter hours of work per day : 10
Enter name of employee : tia
Enter salary : 2000
Enter hours of work per day : 8
Employee Details:
Name: mia, Final Salary: $5650
Name: zia, Final Salary: $3200
Name: kia, Final Salary: $7800
Name: lia, Final Salary: $3400
Name: pia, Final Salary: $1200
Name: fia, Final Salary: $4400
Name: cia, Final Salary: $5150
Name: qia, Final Salary: $2200
Name: jia, Final Salary: $4100
Name: tia, Final Salary: $2050
Process exited after 103.7 seconds with return value 0
Press any key to continue . . .