

Fundamentals of programming

Lab Manual 10



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Lab Task 1:

```
int main(){  
    int input, i;  
    vector<int> v;  
    for(i=0; i<10; i++){  
        cout<<"Enter a Value to Push in "<<i<<" index: ";  
        cin>>input;  
        v.push_back(input);  
    }  
    cout<<endl<<"previous Holding: ";  
    for(i=0; i<10; i++){  
        {  
  
        cout<<v.at(i)<<" ";  
        }  
  
    }  
  
    v.erase(v.begin()+5);  
    v.insert(v.begin()+5, 5);  
    cout<<endl<<"Updated Vector: ";  
    for(i=0; i<10; i++){  
        {  
        cout<<v.at(i)<<" ";  
        }  
    }  
}
```

```
C:\Users\Admin\Desktop\lab x + v
Enter a Value to Push in 0 index: 3
Enter a Value to Push in 1 index: 0
Enter a Value to Push in 2 index: 78
Enter a Value to Push in 3 index: 4
Enter a Value to Push in 4 index: 1
Enter a Value to Push in 5 index: 7
Enter a Value to Push in 6 index: 8
Enter a Value to Push in 7 index: 5
Enter a Value to Push in 8 index: 3
Enter a Value to Push in 9 index: 6

previous Holding: 3, 0, 78, 4, 1, 7, 8, 5, 3, 6,
Updated Vector: 3, 0, 78, 4, 1, 5, 8, 5, 3, 6,
-----
Process exited after 9.958 seconds with return val
```

Lab Task 2:

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

    return mean;
}

int find_median(vector<int> v){
    int i, j, temp, median;
    for(i=0; i<v.size()-1; i++){
        for(j=0; j<v.size()-1; j++){
            if(v[j]>v[j+1]){
```

```

        temp=v[j];
        v[j]=v[j+1];
        v[j+1]=temp;
    }
}

int n=v.size();
if(n%2 == 0){
    median=((n/2)+((n/2)+1))/2;
}
else{
    median=(n+1)/2;
}

return v[median-1] ;
}

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

```

```

        if(repetition>maxrep){
            maxrep=repetition;
            mostrepeated=v[i];
        }
    }
    return mostrepeated;
}

```

```

void students_mode(vector<string> v, vector<int> g, int mode){
    int i=0;
    cout<<"Students with Grade Equal to Mode: ";
    for(i=0; i<v.size(); i++){
        if(g[i]==mode){
            cout<<v[i]<<endl;
        }
    }
}

```

```

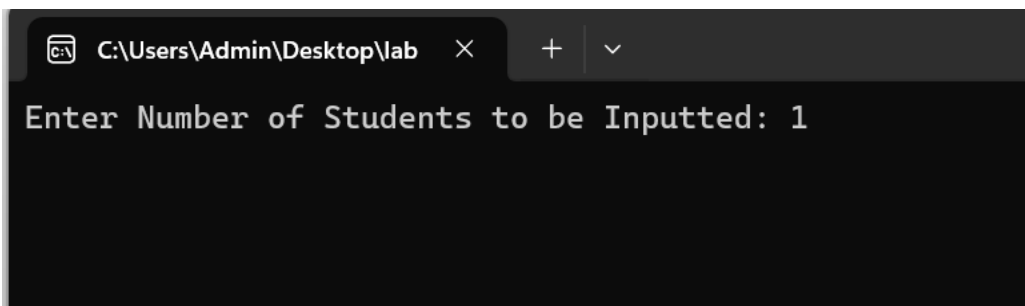
int main(){
    vector<string> names;
    vector<int> grades;
    int i,j,input, num;
    string name;
    cout<<"Enter Number of Students to be Inputted: ";
    cin>>num;
    for(i=0; i<num; i++){
        system("cls");
        cout<<"Enter the Name of Student: ";
    }
}

```

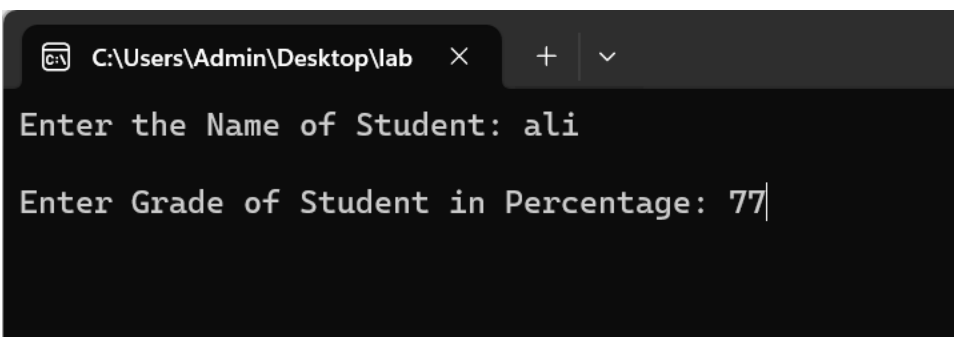
```

        cin>>name;
        names.push_back(name);
        cout<<endl<<"Enter Grade of Student in Percentage: ";
        cin>>input;
        grades.push_back(input);
    }
    system("cls");
    int mean=find_mean(grades);
    cout<<endl<<"Mean is: "<<mean<<endl;
    int median=find_median(grades);
    cout<<"Median is: "<<median<<endl;
    int mode=find_mode(grades);
    cout<<"Mode is: "<<mode<<endl;
    students_mode(names, grades, mode);
}

```



A screenshot of a Windows command prompt window. The title bar shows the file path "C:\Users\Admin\Desktop\lab" and standard window controls. The prompt displays the text "Enter Number of Students to be Inputted: 1" with the number "1" entered at the end of the line.



A screenshot of a Windows command prompt window, continuing from the previous one. The title bar shows the same file path. The prompt displays two lines of text: "Enter the Name of Student: ali" and "Enter Grade of Student in Percentage: 77". The name "ali" and the grade "77" have been entered at the end of their respective lines.

```
C:\Users\Admin\Desktop\lab × + v

Mean is: 77
Median is: 77
Mode is: 77
Students with Grade Equal to Mode: ali

-----
Process exited after 55.05 seconds with return value 0
Press any key to continue . . .
```

Lab Task 3:

```
class triangle{
    public:
        int length1=5;
        int length2=8;
        int length3=10;

        int perimeter(){
            return length1+length2+length3;
        }
        double area(){
            int area,s;
            s=perimeter()/2;
            return sqrt(s * (s - length1) * (s - length2) * (s - length3));
        }
};
```

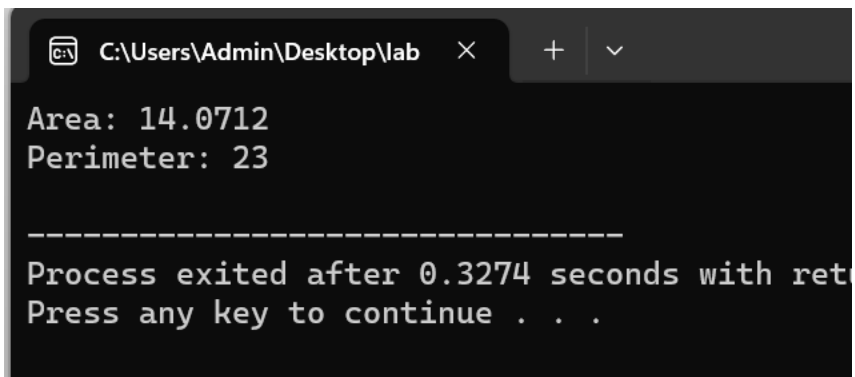
```

int main(){
    triangle task3;
    int perimeter;
    double area;
    perimeter=task3.perimeter();
    area=task3.area();

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

}

```



```

C:\Users\Admin\Desktop\lab
Area: 14.0712
Perimeter: 23

-----
Process exited after 0.3274 seconds with ret
Press any key to continue . . .

```

Lab Task 4:

```
#include <iostream>
```

```
#include <string>
```

```
using namespace std;
```

```
struct Employee {
```

```
    string name;
```

```
    double salary;
```



```

    int hoursWorkedPerDay;
};

int main() {
    const int numEmployees = 10;
    Employee employees[numEmployees];

    for (int i = 0; i < numEmployees; ++i) {
        cout << "please Enter name of employee " << i + 1 << ": ";
        cin >> employees[i].name;

        cout << "please enter salary of employee " << i + 1 << ": ";
        cin >> employees[i].salary;

        cout << "please enter working hours per day for employee " << i + 1 << ": ";
        cin >> employees[i].hoursWorkedPerDay;

        cout << endl;
    }

    for (int i = 0; i < numEmployees; ++i) {
        if (employees[i].hoursWorkedPerDay >= 12) {
            employees[i].salary += 150;
        } else if (employees[i].hoursWorkedPerDay >= 10) {
            employees[i].salary += 100;
        } else if (employees[i].hoursWorkedPerDay >= 8) {
            employees[i].salary += 50;
        }
    }
}

```

```

    }
}

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

```

```

C:\Users\Admin\Desktop\lab
please enter salary of employee 7: 250
please enter working hours per day for employee 7: 15

please Enter name of employee 8: ben
please enter salary of employee 8: 450
please enter working hours per day for employee 8: 4

please Enter name of employee 9: anny
please enter salary of employee 9: 300
please enter working hours per day for employee 9: 6

please Enter name of employee 10: tom
please enter salary of employee 10: 650
please enter working hours per day for employee 10: 8

Employee Details:
Name: ali,Salary: $650
Name: john,Salary: $400
Name: max,Salary: $650
Name: zain,Salary: $350
Name: ayan,Salary: $550
Name: abdullah,Salary: $550
Name: acc,Salary: $400
Name: ben,Salary: $450
Name: anny,Salary: $300
Name: tom,Salary: $700
=====

```

