Fundamentals of Programing

Lab Manual # 10

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# Task 1:

#include<iostream>

#include<vector>

using namespace std;

int main(){

int input, i;

vector<int> v;

for(i=0; i<10; i++){

cout<<"Enter a Value to Push into Vector's "<<i<<" index: ";

cin>>input;

v.push\_back(input);

}

cout<<endl<<"Vector Currently 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: ";

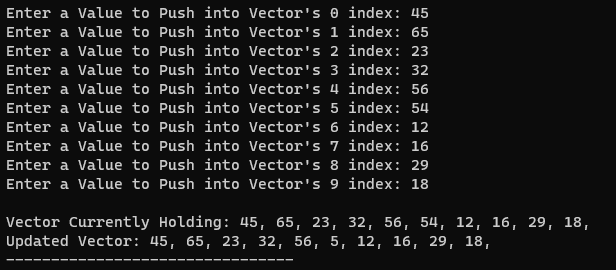
for(i=0; i<10; i++)

{

cout<<v.at(i)<<", ";

}

}



**Task 2:**

#include<iostream>

#include<vector>

#include<string>

using namespace std;

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);

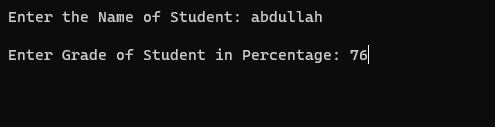
cout<<"Median is: "<<median<<endl;

int mode=find\_mode(grades);

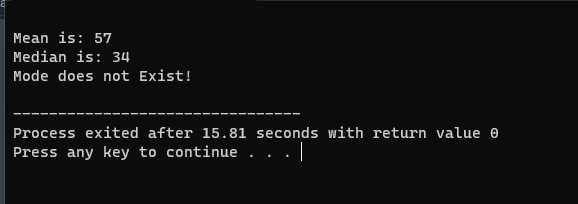
cout<<"Mode is: "<<mode<<endl;

students\_mode(names, grades, mode);

}

****

Inputting names

****

Mode does not exist since repetition is only once for all.

# Task 3:

#include<iostream>

#include<cmath>

using namespace std;

class triangle{

public:

int length1=3;

int length2=4;

int length3=5;

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;

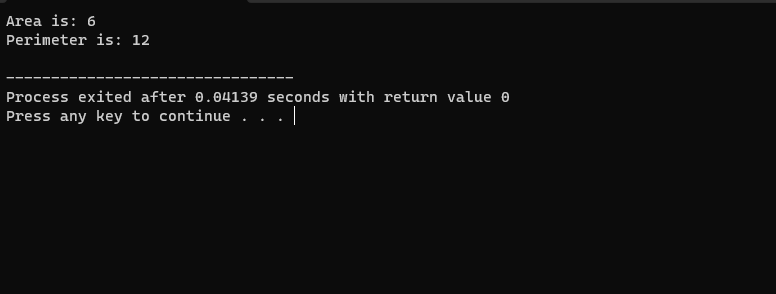
perimeter=task3.perimeter();

area=task3.area();

cout<<"Area is: "<<area<<endl;

cout<<"Perimeter is: "<<perimeter<<endl;

}



# 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 << "Enter name for employee " << i + 1 << ": ";

cin >> employees[i].name;

cout << "Enter salary for employee " << i + 1 << ": ";

cin >> employees[i].salary;

cout << "Enter hours of work 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 << ", Final Salary: $" << employees[i].salary << endl;

}

}

