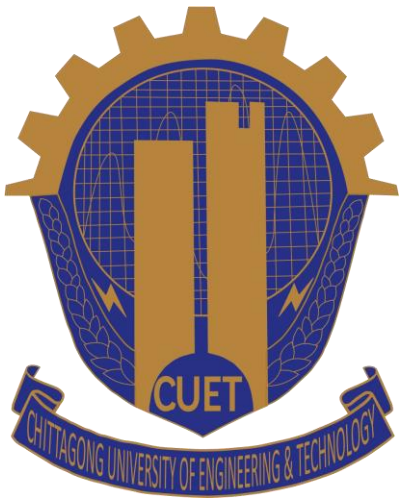
Chittagong University of Engineering & Technology



Department of Electronics & Telecommunication Engineering

Name of the Experiment:

Introduction to Class and Objects in OOP.

Course No. : CSE-284
Course Title : Object Oriented Programming
Experiment No. : 01
Date of Exp. : 26-09-2024
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Remarks :

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Term : 02
Group : 02

Experiment Name :

Introduction to Class and Objects in OOP

Objectives:

- To introduce with the Class and Objects in C++ .
- To create data member and member function (Method) of a class.
- To understand the concept of visibility of data member and member function(Public and Private access).

Example-1 :

Write a C++ program to define a class BOX and create objects of this class.

Input:

```
#include<iostream>
using namespace std;
int main()
{
   class box{
       public:
      int len;
      int wid;
      int dep;
      double vol;
   };
   box box1;
   box box2;
   box1.len = 10;
   box1.dep = 10;
   box1.wid = 10;
   box2.len = 5;
   box2.dep = 5;
   box2.wid = 5;

   box1.vol = box1.len * box1.dep * box1.wid;
   cout<<box1.vol<<endl;
   box2.vol = box2.len * box2.dep * box2.wid;
   cout<<box2.vol;
}
```

Output :

Example-2 :

Write a C++ program to define a class BOX with member func tions.

Input:

```
 #include<iostream>
using namespace std;
class BOX
{
    public:
    double length, breadth, height;
    void input_value()
    {
        cout<<"Enter three sides: "<<endl;
        cin>>length>>breadth>>height;
    }
    void print_value()
    {
        cout<<"Length: "<<length<<endl;
        cout<<"Breadth: "<<breadth<<endl;
        cout<<"Height: "<<height<<endl;
    }
    double volume()
    {
      double v = length*breadth*height;
      cout<<"Volume of the box: "<<v<<endl;
    }
};
int main(){
   BOX mybox;
   BOX mybox2;
   mybox.input_value();
   mybox.print_value();
   mybox.volume();
   mybox2.input_value();
   mybox2.print_value();
   mybox2.volume();
}
```

Output :

Example-3 :

Write a C++ program to understand public and private access of class data members.

Input:

```
#include <iostream>
using namespace std;
class myTest
{
private:
int a,b,c;
public:
void access_private()
{
cin>>a>>b>>c;
cout<<a<<" "<<b<<" "<<c<<endl;
}
};
int main()
{
myTest v;
v.access_private();//Public function to access private members
}
```

Output :

Example-4 :

Write a C++ program to understand public and private access of class data members.

Input:

```
#include<iostream>
using namespace std;
class Box{
  private:
  double length;
  double breadth;
  double height;
  public:
    void initData(double len, double brth, double hgt){
    length=len;
    breadth=brth;
    height=hgt;
    }

    double calculateArea(){
        return length*breadth;
    }double calculateVol(){
        return length*breadth*height;
    }
  };
int main()
{
  Box box1;
  box1.initData(42.5, 30.2, 10.2);
  cout<<"Area = "<<box1.calculateArea()<<endl;
  cout<<"Volume= "<<box1.calculateVol()<<endl;
  return 0;
}
```

Output :

Practice-1 :

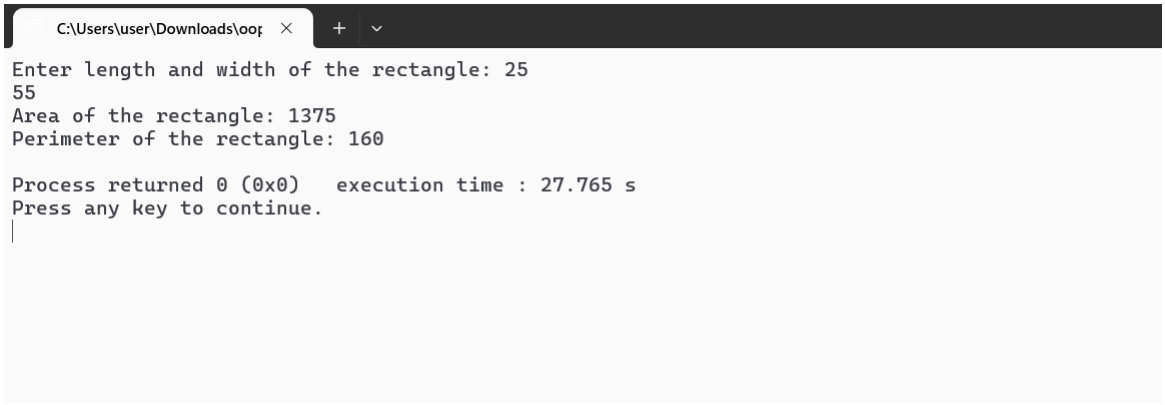
Write a class having two private variables and one member function which will return the area and perimeter of the rectangle.

Input:

```
#include<iostream>
using namespace std;
class rectangale{
    private:
    double length, width;
```

```
    public:
    void input(){
        cout<<"Enter length and width of the rectangle: ";
        cin>>length>>width;
    }
    double area(){
        return length * width;
    }
    double perimeter(){
        return 2 * (length + width);
    }
};
int main(){
    rectangale myrect;
    myrect.input();
    cout<<"Area of the rectangle: "<<myrect.area()<<endl;
    cout<<"Perimeter of the rectangle: "<<myrect.perimeter()<<endl;
return 0;
}
```

Output :



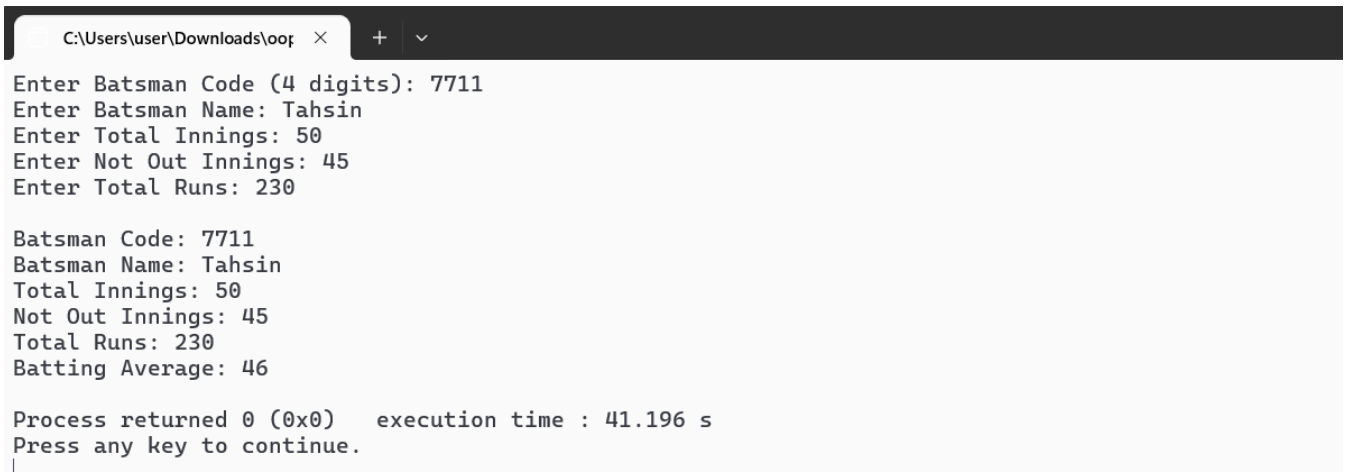
Practice-2 :

2. Write a C++ Program to define a class batsman with the following specifications:
Private members:
batsman code: 4 digits code number
batsman name: 20 characters(string)
total innings, notout innings, toal runs: integer type
calcavg(): Function to compute batavg batting avg: [total runs/(total innings-notout innings)] (formula to calcu late batting average)
Public members:
readdata(): Function to accept value from batsman code, batsman name, to tal innings, notout innings, total runs and invoke the function calcavg().
displaydata(): Function to display the data members on the screen. Access all the data members and member functions to calculate batting aver age of a batsman by creating its object.

Input:

```
#include <iostream>
#include<string>
using namespace std;
class batsman
{
private:
    int bcode;
    // char bname[20];
    string bname;
    int total_innings, notout_innings, total_runs;
    double batting_avg;
    void calcavg()
    {
        if (total_innings-notout_innings>0){
            batting_avg = total_runs/(total_innings-notout_innings);
        }else{
            batting_avg = 0.0;
        }
    }
public:
    void readdata()
    {
        cout << "Enter Batsman Code (4 digits): ";
        cin >> bcode;
        cout << "Enter Batsman Name: ";
        cin >> bname;
        cout << "Enter Total Innings: ";
        cin >> total_innings;
        cout << "Enter Not Out Innings: ";
        cin >> notout_innings;
        cout << "Enter Total Runs: ";
        cin >> total_runs;
        calcavg();
    }
    void displayData()
    {
        cout << "\nBatsman Code: " << bcode << endl;
        cout << "Batsman Name: " << bname << endl;
        cout << "Total Innings: " << total_innings << endl;
        cout << "Not Out Innings: " << notout_innings << endl;
        cout << "Total Runs: " << total_runs << endl;
        cout << "Batting Average: " << batting_avg << endl;
    }
};
int main()
{
    batsman b1;
    b1.readdata();
    b1.displayData();
    return 0;
}
```

Output :



Discussion:

In this experiment above, class and objects in C++ were introduced. Here, public and private access of data members and member functions were also familiarized. Member and member functions of a class was created and observed. While solving the problems, I faced a liitle bit difficulty in understanding the use of member functions and accessing private members. So some errors occurred while accessing the private members but then I fixed the error soon and solved the problems as well.