

NAME: MUHAMMAD SAEED KHAN

ID: 16015

DEPARTMENT: BSCS-2

SUBJECT: OOP

INSTRUCTOR: MUHAMMAD AYUB KHAN

Q1. What is Class and role of object in a Class, explain in detail with the help of a suitable program ?

ANSWER:

CLASS:

A class is a collection of objects with same properties and functions.

A class is used to define the characteristic of the objects OR in simple words classes are designs for creating objects.

Keyword for a class is class.

ROLE OF OBJECT IN CLASS:

OBJECT:

Object is an entity that consists of data and functions.

ROLE IN CLASS:

Object is an element in the class, it is the actual component of programs while the class specifies how instances are created and how they behave.

A class is simply a model or prototype for creating objects.

Object is also known as instance. The process of creating object in class is called instantiation.

SYNTAX:

Class-name object-name

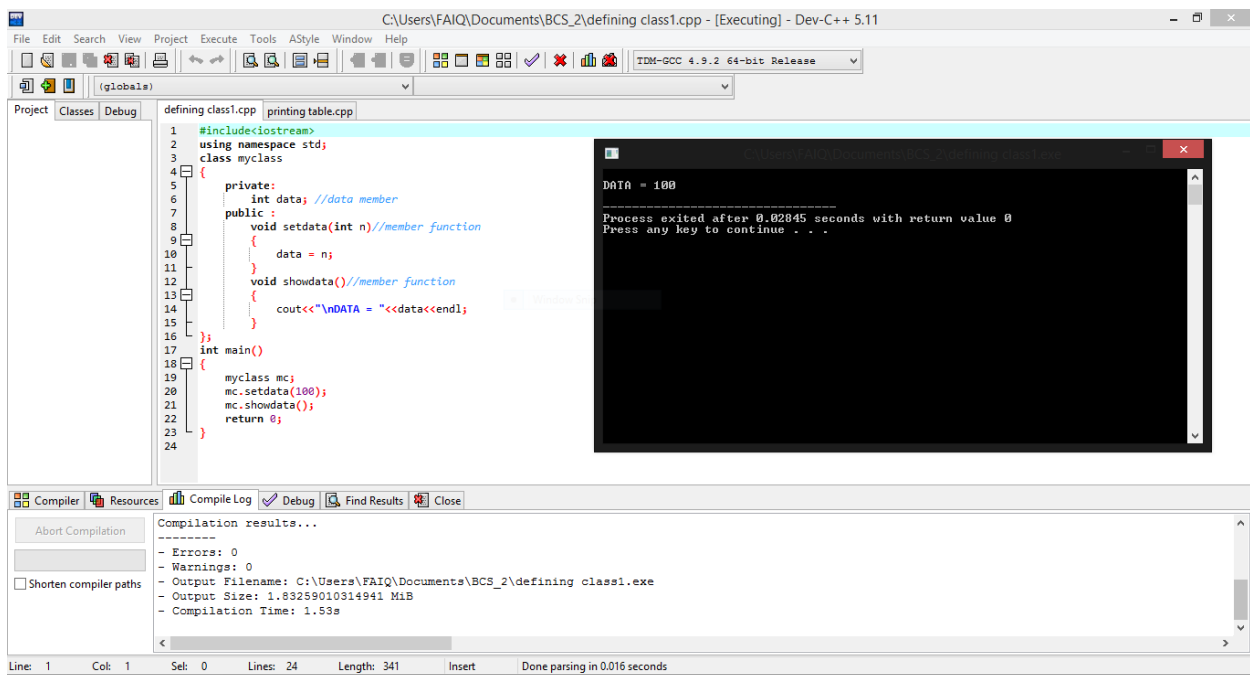
Where class-name is the name of class.

AND object-name is the name of object.

EXAMPLE:

Test-object

When text is class name and the object contain all data members that are define in class test.



The screenshot displays the Dev-C++ IDE interface. The main window shows a C++ source file named 'defining class1.cpp'. The code defines a class 'myclass' with a private data member 'int data;' and two public member functions: 'void setdata(int n);' and 'void showdata();'. The 'main' function creates an object 'mc' of type 'myclass', sets its data to 100, and calls 'showdata()' to print the value.

```
1 #include<iostream>
2 using namespace std;
3 class myclass
4 {
5     private:
6         int data; //data member
7     public:
8         void setdata(int n)//member function
9         {
10            data = n;
11        }
12        void showdata();//member function
13        {
14            cout<<"\nDATA = "<<data<<endl;
15        }
16    };
17    int main()
18    {
19        myclass mc;
20        mc.setdata(100);
21        mc.showdata();
22        return 0;
23    }
24 }
```

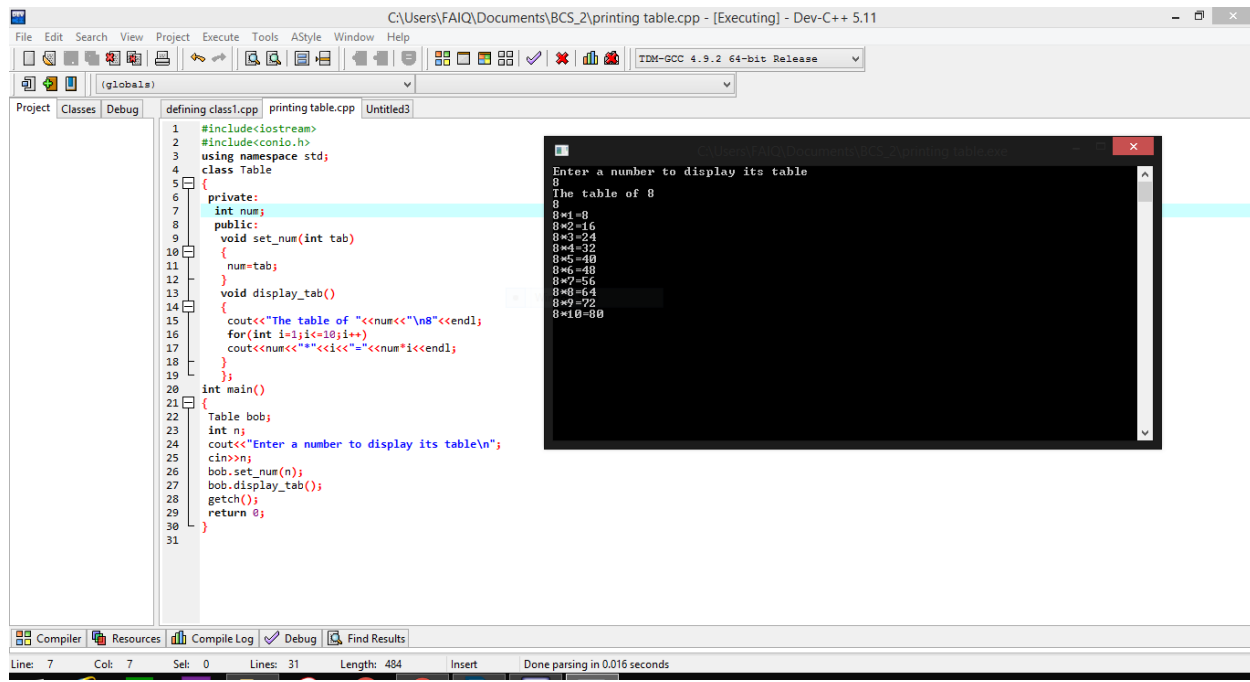
The output window shows the execution results:

```
DATA = 100
-----
Process exited after 0.82845 seconds with return value 0
Press any key to continue . . .
```

The bottom status bar indicates 'Line: 1 Col: 1 Sel: 0 Lines: 24 Length: 341 Insert Done parsing in 0.016 seconds'.

Q2. Write a program about table printing which takes input from the user on the basis of OOP and explain in detail.

ANSWER:



```
1 #include<iostream>
2 #include<conio.h>
3 using namespace std;
4 class Table
5 {
6     private:
7         int num;
8     public:
9         void set_num(int tab)
10        {
11            num=tab;
12        }
13        void display_tab()
14        {
15            cout<<"The table of "<<num<<"\n8"<<endl;
16            for(int i=1;i<=10;i++)
17                cout<<num<<"*"<<i<<"="<<num*i<<endl;
18        }
19    };
20    int main()
21    {
22        Table bob;
23        int n;
24        cout<<"Enter a number to display its table\n";
25        cin>>n;
26        bob.set_num(n);
27        bob.display_tab();
28        getch();
29        return 0;
30    }
31 }
```

```
Enter a number to display its table
8
The table of 8
8*1=8
8*2=16
8*3=24
8*4=32
8*5=40
8*6=48
8*7=56
8*8=64
8*9=72
8*10=80
```

EXPALINATION:

Here in this program we use class and objects to print a table, which is inputted by the user himself.

As we know class is the collection of related data and functions under a single name.

I use data member and member function in the following program.

DATA MEMBER:

The data with in the class is known as data member.

MEMBER FUNCTION:

The function defined with in the class is known as member function.

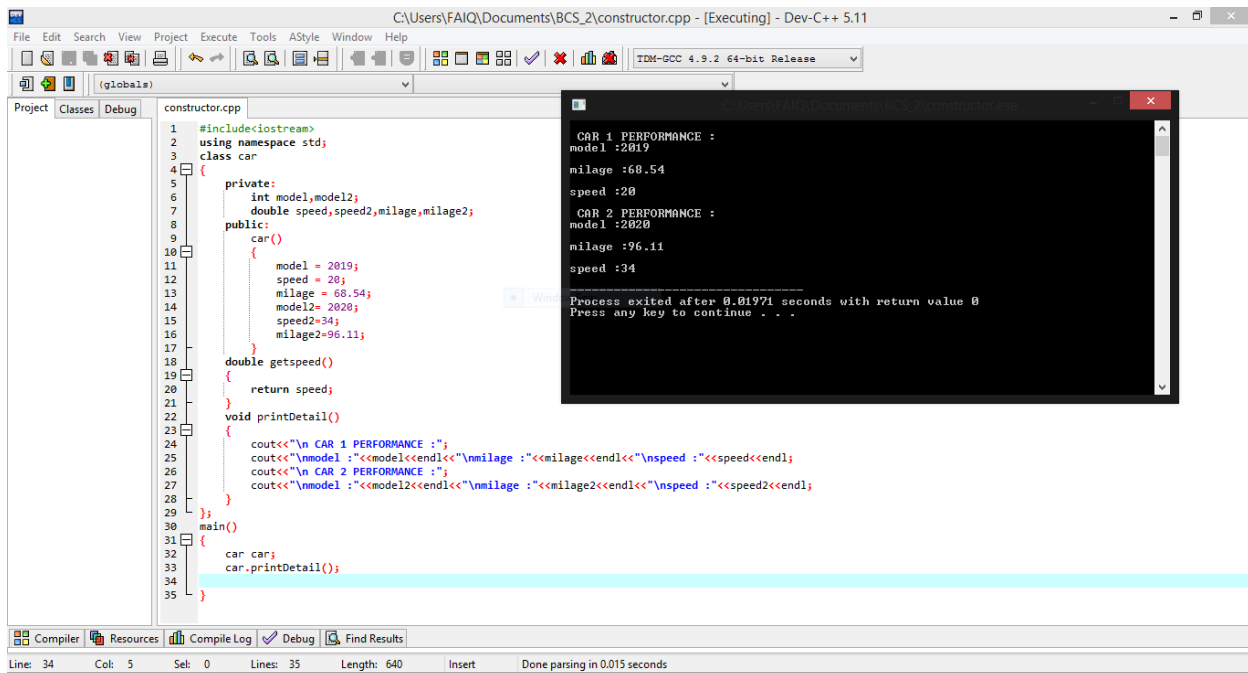
A message will display asking for a number. We will enter any number suppose I enter 8. The whole program will be processed step by step and the for loop is used in this program.

For loop is used until i is less than or equal to 10. If i became greater than 10 then the for loop will be stopped and further processing will be started.

The output will be displayed after pressing F11 if and only the program is completely correct.

Q3. Write a program about any 2 cars which can calculate the performance of both of them and explain in detail.

ANSWER:



The screenshot shows a C++ IDE with a file named 'constructor.cpp'. The code defines a 'car' class with private attributes for model, speed, and mileage, and public methods for getting speed and printing details. The main function creates two car objects and prints their performance details.

```
1 #include<iostream>
2 using namespace std;
3 class car
4 {
5     private:
6         int model,model2;
7         double speed,speed2,milage,milage2;
8     public:
9         car()
10        {
11            model = 2019;
12            speed = 20;
13            milage = 68.54;
14            model2= 2020;
15            speed2=34;
16            milage2=96.11;
17        }
18        double getspeed()
19        {
20            return speed;
21        }
22        void printDetail()
23        {
24            cout<<"\n CAR 1 PERFORMANCE :";
25            cout<<"\nmodel :"<<model<<endl<<"\nmilage :"<<milage<<endl<<"\nspeed :"<<speed<<endl;
26            cout<<"\n CAR 2 PERFORMANCE :";
27            cout<<"\nmodel :"<<model2<<endl<<"\nmilage :"<<milage2<<endl<<"\nspeed :"<<speed2<<endl;
28        }
29    };
30    main()
31    {
32        car car;
33        car.printDetail();
34    }
35 }
```

The output window shows the following results:

```
CAR 1 PERFORMANCE :
model :2019
milage :68.54
speed :20
CAR 2 PERFORMANCE :
model :2020
milage :96.11
speed :34
-----
Process exited after 0.01971 seconds with return value 0
Press any key to continue . . .
```

EXPLANATION:

In the following program the performance of two cars that is mileage and speed is displayed with the model.

Car is the name of the class where the car model, speed of the car and the mileage are the private access while the print detail is kept public with data type void.

In the main body of the program object of the car is created and by function calling the function is called and the program is executed by pressing F11.

The program is first compiled and then run if there is no error in the program.

