

Name:

Muhammad Ali Khan

Reg No:-

16550

Instructor :-

Muhammad Ayub Khan.

Subject :-

Object oriented Programming

Paper:

Mid Term.

Q1: What <sup>Key 10350</sup> is class and role of object in a class, explain in detail with the help of a suitable program? ①

Ans: A Class is a user defined blueprint or prototype from which objects are created. It represents the set of properties or methods that are common to all objects of one type. In general, class declaration can include these components, in order:

1: Modifiers :-

A class can be public or has default access (Refer this for details).

2: Class Name :-

The name should begin with a initial letter (capitalized by convention).

3: Super class (if any) :-

The name of the class's parent (super class), if any, preceded by the keyword extends. A class can only extend (subclass), ~~one~~ ~~one~~ one parent.

4: Interfaces (if any) :-

A comma-separated list of interface implemented by the class, if any, preceded by the keyword implements. A class can implement more than one interface.

5: Body:-

The class body surrounded by braces, { }.

Constructors are used for initializing new objects. Fields are available that provides the state of the class and its objects, and methods are used to implement the behaviour of the class and its objects.

There are various types of classes that are used in real time applications such as nested classes, anonymous classes, lambda expressions.

Example:-

```
public class My class {  
    int x = 5;  
}
```

In the above example a class create with the name of MY CLASS with the variable x.

## Object:-

Reg no . 16550

③

It is a basic unit of Object-oriented programming and represents the real-life entities. A typical Java program creates many objects, which as you know, interact by invoking methods. An object consists of:

### (a) State:-

It is represented by attributes of an object. It also reflects the properties of an object.

### (b) Behaviour:-

It is represented by methods of an object. It also reflects the response of an object with the other objects.

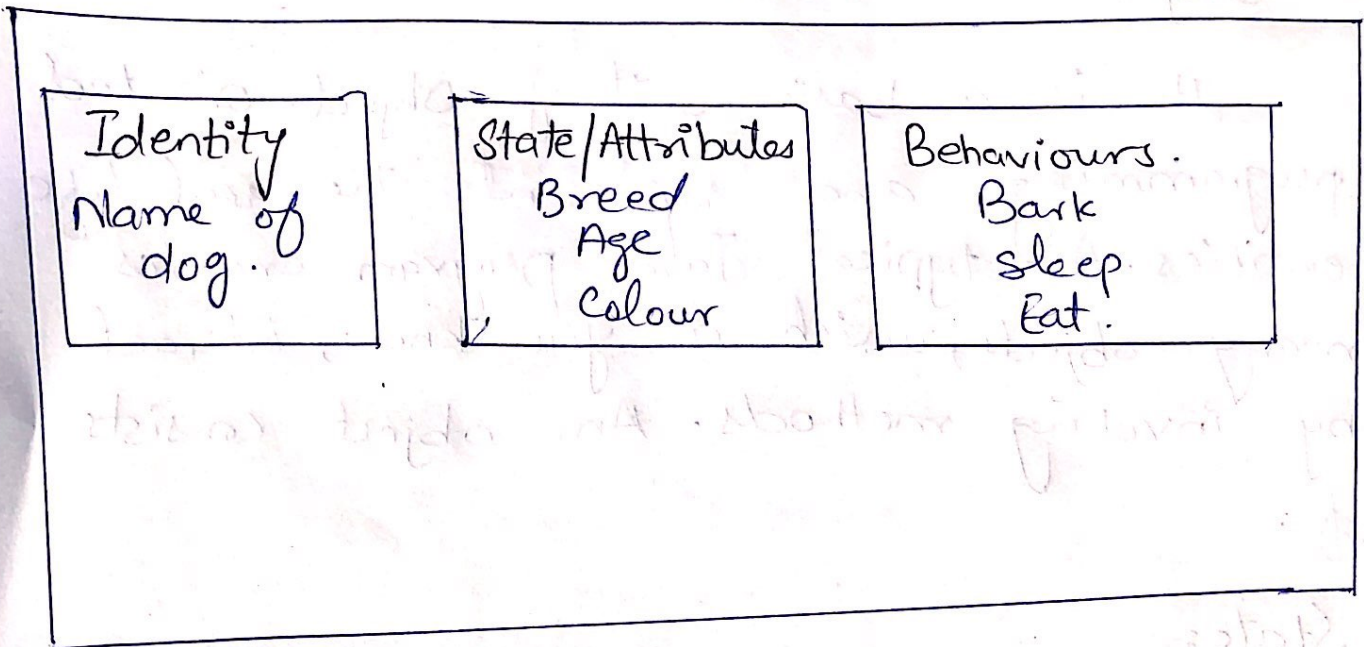
### (c) Identity:-

It gives a unique name to an object and enables one object to interact with other objects.

### Example:-

Example of an object: dog

P.T.O



Objects correspond to thing found in the real world. For example, a graphics program may have objects such as "circle", "square".

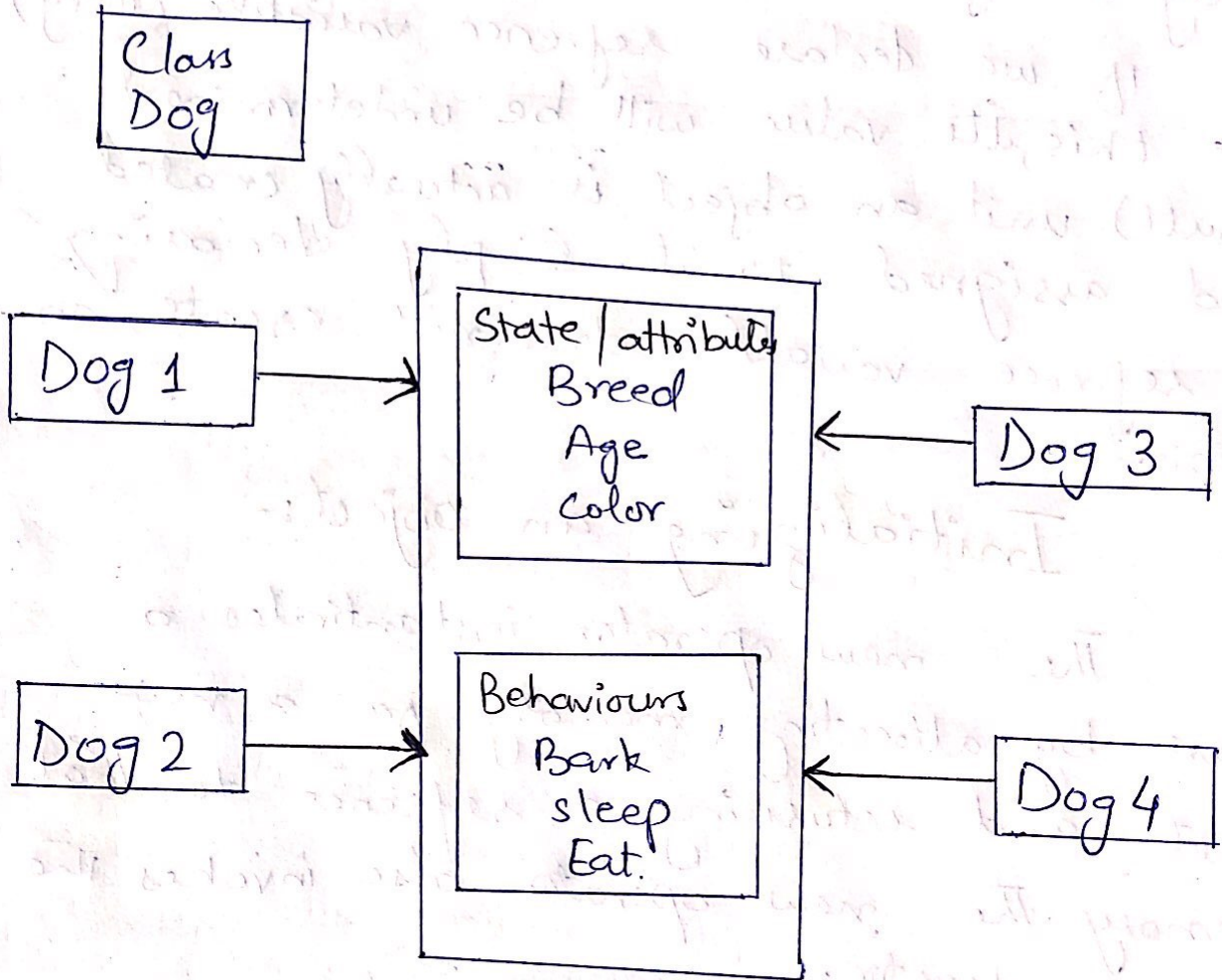
An online shopping system might have objects such as "shopping cart", "customer", and "product".

Declaring objects (Also called instantiating a class):

When an object of class is created, the class is said to be instantiated. All the instances share the attributes and the behaviour of the class. But the values of those attributes, i.e. the state are unique for each object. A single class may have any number

number of instances.

Example :-



As we declare variable like (type name;). This notifies the compiler that we will use name to refer to data whose type is type. With a primitive variable, this declaration also reserves the proper amount of memory for the variable. So, for references variable, type must be strictly a concrete class name. In general,

we can't create objects of an abstract class or interface.

Dog tuffy;

If we declare reference variable (tuffy) like this, its value will be undetermined (null) until an object is actually created and assigned to it. Simply declaring a reference variable does not create an object.

Initializing an object:-

The new operator instantiates a class by allocating memory for a new object and returning a reference to that memory. The new operator also invokes the class constructor.

// Class declaration.

public class dog.

// Instance variables

String name;

String breed;

int age;

String colour;

// Constructor declaration of class

```
Public Dog (string name, string breed, int age,  
string colour)
```

```
{  
    this.name = name;  
    this.breed = breed;  
    this.age = age;  
    this.colour = color;  
}
```

// method 1

```
Public string getName ()
```

```
{  
    return name;  
}
```

// method 2

```
Public string getName Age ()
```

```
{  
    return age;  
}
```



// method 4

```
public string get color ()
```

```
{
    return color;
}
```

```
}
```

@Override

```
public string toString ()
```

```
return ("Hi my name is " + this.getName () +
```

```
" .In My breed ,age and color are " +
```

```
this .get Breed () + " , " + this .get Age () +
```

```
" , " + this .get color ();
```

```
}
```

```
public static void main (string [] args)
```

```
{
```

```
Dog tuffy = new Dog ("tuffy", "papillon", 5,
```

```
"white");
```

```
system.out.println (tuffy.toString());
```

```
}
```

```
}
```

Out put

Hi my name is tuffy.

My breed ,age and color are papillon ,5, white .

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

Ans. Program Body:

```
import java.util.Scanner;
```

```
public class Main {
```

```
    public static void main (String [] args) {
```

```
        Scanner in = new Scanner (System.in);
```

```
        System.out.println ("Input the Number:");
```

```
        int n = in.nextInt ();
```

```
        for (int i = 1; i <= 10; i++) {
```

```
            System.out.println (n + "*" + i + " = " + (n*i));
```

```
        }
```

```
    }
```

```
}
```

Output:

Input the Number:

8

$$8 * 1 = 8$$

$$8 * 2 = 16$$

$$8 * 3 = 24$$

$$8 * 4 = 32$$

$$8 * 5 = 40$$

$$8 * 6 = 48$$

$$8 * 7 = 56$$

$$8 * 8 = 64$$

$$8 * 9 = 72$$

$$8 * 10 = 80$$

Code explanation:-

When we execute the code a console will appear and ask for input a number. When we enter any digit it will execute table of that number.

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

Ans  
 Public class Car {

Private int model;

Private int speed;

Private mile per gallon MPG;

Public int get model ( ) {

return model;

Public int get speed ( ) {

return speed;

Public car (int model, int speed, Mile Per  
 Model MPG)

{

model = model;

MPG = MPG

Key no 16570.

```
Speed = 0;
```

```
}
```

```
public void accelerate ( ) {
```

```
    Speed = speed + 5
```

```
}
```

Explanation:-

We created a class with a name car, we will send car speed, model and miles Per Gallon. In this program will show us the comparison of speed, model, fuel consumption, will check the performance of the cars.