Subject: SBL-OOPJ **Class: SE-Data Science**
Semester: III **A.Y. 2022-2023**

Experiment No. 3

❖ **Aim :** Write a Java program to the use of class and object., that would print the information (name, DOB, Mobile number) of students by creating a class named 'Student'.

❖ **Theory :**

- **Java class :**
- A class is a group of objects which have common properties. It is a template or blueprint from which objects are created. It is a logical entity. It can't be physical.
- A class in Java can contain:
  - Fields
  - Methods
  - Constructors
  - Blocks
  - Nested class and interface

Syntax to declare a class:

```
class <class_name>{
   field;
   method;
}
```

A class can contain any of the following variable types.

- **Local variables** − Variables defined inside methods, constructors or blocks are called localvariables. The variable will be declared and initialized within the method and the variablewill be destroyed when the method has completed.
- **Instance variables** − Instance variables are variables within a class but outside any

method. These variables are initialized when the class is instantiated. Instance variables can be accessed from inside any method, constructor or blocks of that particular class.

- **Class variables** − Class variables are variables declared within a class, outside any method,with the static keyword.

- A class can have any number of methods to access the value of various kinds of methods. In theabove example, barking(), hungry() and sleeping() are methods.

- **Objects in Java :**
  - Objects have states and behaviors. Example: A dog has states - color, name, breed as well asbehaviors – wagging the tail, barking, eating. An object is an instance of a class.
  - If we consider the real-world, we can find many objects around us, cars, dogs, humans, etc.
  - All these objects have a state and a behavior.
  - **State:** represents the data (value) of an object.
  - **Behavior**: represents the behavior (functionality) of an object such as deposit, withdraw, etc.
  - **Identity:** An object identity is typically implemented via a unique ID. The value of the ID is not visible to the external user. However, it is used internally by the JVM to identify each object uniquely.
  - If we consider a dog, then its state is - name, breed, color, and the behavior is - barking,wagging the tail, running.
  - If you compare the software object with a real-world object, they have very similar characteristics.
  - Software objects also have a state and a behavior. A software object's state is stored in fieldsand behavior is shown via methods.
  - So in software development, methods operate on the internal state of an object and the object-to-object communication is done via methods.
- **Creating an Object :**
  - As mentioned previously, a class provides the blueprints for objects. So basically, an

objectis created from a class. In Java, the new keyword is used to create new objects.

- There are three steps when creating an object from a class −
  - **Declaration** − A variable declaration with a variable name with an object type.
  - **Instantiation** − The 'new' keyword is used to create the object.
  - **Initialization** − The 'new' keyword is followed by a call to a constructor. Thiscallinitializes the new object.

Object Syntax in Java

ClassName ReferenceVariable = new ClassName();

- **Example**

```
1  public class Puppy {
2     public Puppy(String name) {
3        // This constructor has one parameter, name.
4        System.out.println("Passed Name is :" + name );
5     }
6
7     public static void main(String []args) {
8        // Following statement would create an object myPuppy
9        Puppy myPuppy = new Puppy( "tommy" );
10    }
11 }
```

- If we compile and run the above program, then it will produce the following result –
  - Output
  - Passed Name is :tommy
- **Conclusion :**
  - Summarize what you understood from this lab.