St. Francis Institute of Technology, Mumbai-400 103

Department Of Information Technology

A.Y. 2023-24

Class: SE-ITA/B, Semester: III

Subject: **Java Labs**

Experiment 5

Aim: Write a program to demonstrate java class and interface

1. Aim:

i. Create an interface vehicle and classes like bicycle, car, bike etc, having common functionalities and put all the common functionalities in the interface. Classes like Bicycle, Bike, car etc implement all these functionalities in their own class in their own way.

2. Prerequisite: Knowledge of inheritance and interfaces in Java.

3. Requirements: Personal Computer (PC), Windows Operating System, ,JDK 1.8 and above,online java compiler/IDE.

4. Pre-Experiment Exercise:

Theory:

a. Interfaces:

An interface is just like Java Class, but it only has static constants and abstract method. Java uses Interface to implement multiple inheritance. A Java class can implement multiple Java Interfaces. All methods in an interface are implicitly public and abstract.

Syntax for declaring Interface:

```
interface interface_name
{
//Methods
}
```

Syntax for implementing interfaces:

```
class class_name implements interface_name{}
```

Laboratory Exercise:

A. Procedure :

1. Write java code and save with .java extension
2. Compile program using javac filename.java
3. Run program using java filename

A. Extended Theory:

A. Extended Theory:

1. Explain how to implement Multiple Inheritance in Java with syntax and example.

2. What is an Interface ? What is meant by `implementing interfaces' ? Explain with the help of an example.

3. Differentiate between Abstract Class and Interfaces.

B. Questions/Programs:

1. Consider a hierarchy, where a sportsperson can either be an athlete or a hockey player. Every sportsperson has a unique name. An athlete is characterized by the event in which he/she participates; where as a hockey player is characterised by the number of goals scored by him/her.

   Perform the following tasks using Java :

   (i)Create the class hierarchy with suitable instance variables and methods.

   (ii) Create a suitable constructor for each class.

   (iii) Create a method named display_all_info with suitable parameters. This method should display all the information about the object of a class.

   (iv)Write the main method that demonstrates polymorphism.

2. Create one abstract class shape and abstract method draw. Create class rectangle and circle that will inherit method from Shape class.Make necessary assumptions.

C. Conclusion:

1. Write what was performed in the experiment/program.

2. Mention few applications of what was studied.

D. References

1. Balguruswamy, “Programming with java A primer”, Fifth edition, Tata McGraw Hill Publication. 2. Let Us Java-Yashwant Kanetkar.

3. Learn to Master JAVA, from Star EDU solutions , by ScriptDemics.

4. Java 8 Programming-Black Book,by-Dreamtech Publications.

5. www.programmingsimplified.com.