**Lab 1: Introduction to OOP using Java Programming**

**Introduction**

This laboratory exercise introduces Object Oriented Programming using JAVA. The topics covered in this exercise are Classes, Objects, Java Methods and Attributes.

**Objective**

At the end of this laboratory session the students should be able to.

1. Create a Java Class and how to define Class attributes and methods.
2. Use objects in JAVA programming.
3. Implement multi class program and how each Class can communicate to one another.

**Tools/Software Requirements**

The following software are needed to be installed in the computer system to test and run the given programming examples, and to solve the programming exercise.

1. NetBeans IDE (Version 7.2 or higher).
2. Java Development Kit (JDK Version 7 or higher).

**Description**

This laboratory exercise contains two examples. The first exercise is the Welcome.java that will show the basic Java construct, the program will just display “Welcome to Java!” in the output window. The second exercise is the Student.java and Student\_Records.java that will show how Class attributes and methods are used in Java programming, it will also show how these Classes can communicate with each other using objects and methods.

***Note: Red text in the code are comments that are used to discuss the different parts of the program.***

**Exercise 1: Welcome.java**

This program will display Welcome to Java!.

**//Welcome Class**

**public class Welcome**

**{//start of Class**

**//Main method**

**public static void main(String[]args)**

**{// Start of main method**

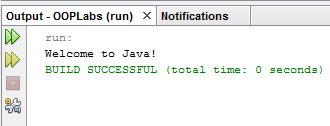
**//Prints Welcome Java in the output window**

**System.out.println("Welcome to Java!");**

**} //End of main method**

**} //End of class**

**Output:**

****

**Exercise 2: Student.java and Students\_Records.java**

This program will store 3 student record in an ArrayList and display the Information.

**Student.java Code**

**public class Student {**

**//Class attributes**

**int student\_id;**

**String student\_name;**

**int student\_year;**

**String student\_department;**

**//Constructor with formal parameters/arguments**

**Student(int id, String name, int age, String department)**

**{**

**//Assign values from Formal Parameters to Class Fields**

**this.student\_id = id;**

**this.student\_name = name;**

**this.student\_year = age;**

**this.student\_department = department;**

**}**

**//Accessor methods**

**//Returns the Id of the student**

**public int getId(){**

**return student\_id;**

**}**

**//Returns the Name of the student**

**public String getName(){**

**return student\_name;**

**}**

**//Returns the Year of the student**

**public int getYear(){**

**return student\_year;**

**}**

**//Returns the Department of the student**

**public String getDepartment(){**

**return student\_department;**

**}**

**}**

**Studens\_Records.java Code**

**//import util package to use ArrayList and Scanner Class**

**import java.util.\*;**

**//Class Students\_Records**

**public class Students\_Records {**

**//Declaration of ArrayList Object for Student Class**

**ArrayList<Student> list = new ArrayList<Student>();**

**//Main method**

**public static void main(String[] args)**

**{ //instantiation of Studens\_Records object**

**Students\_Records studRec = new Students\_Records();**

**}**

**//Students\_Records Constructor**

**public Students\_Records()**

**{ //Declaration of Scanner object to accept input from the user**

**Scanner input = new Scanner(System.in);**

**//Loop statement is used to repeat codes 3 times**

**for (int i = 0; i < 3; i++) {**

**//Display message**

**System.out.print("Enter Student\_Id: ");**

**//accept an integer value for id**

**int id = input.nextInt();**

**//Display message**

**System.out.print("Enter Student\_Name: ");**

**//accept an integer value for id**

**String name = input.next();**

**//Display message**

**System.out.print("Enter Student\_Year: ");**

**//accept an integer value for id**

**int year = input.nextInt();**

**//Display message**

**System.out.print("EnterStudent\_Department: ");**

**//accept an integer value for id**

**String department = input.next();**

**//add Student to ArrayList**

**list.add(new Student(id, name, year, department));**

**}**

**//this code below displays the content of the ArrayList**

**for(int ctr=0;ctr<3;ctr++){**

**System.out.print(" "+list.get(ctr).getId());**

**System.out.print(" "+list.get(ctr).getName());**

**System.out.print(" "+list.get(ctr).getYear());**

**System.out.print(" "+list.get(ctr).getDepartment());**

**System.out.println("");**

**}**

**}**

**}**

**Exercise 1:**

**Create a Class named StudentInformation with methods to set and get data for the following attributes.**

**Student:**

* **Name**
* **birthdate**
* **Address**
* **Course**
* **Year**
* **Contact number**
* **Email address**

**Create another class named StudentRegistration and add 5 students information in a ArrayList. Display all student information on the screen.**