Workshop 3

Type: workshop
Code: Pro192
Slot(s): 5-6-7

I. Knowledge required: Concept of Class, Object, Field, Property, Method, Constructor, ArrayList.

II. Learning Outcome:

- ✓ Apply Data abstraction to declare Class.
- ✓ Know how to build Class, initialize and use objects in Java.
- ✓ Applying encapsulation in OOP using access modifier and package organization.
- ✓ Practice coding and solving problems from the perspective of object-oriented programming.

III. Content

1. Rewrite the following classes and fix all errors for the program

```java
public class Person {
//khai bao cac truong(field)
    private int id;
    private String name;
    private boolean gender;
    public Person(int id, String name, boolean gender) {
        this.id = id;
        this.name = name;
        this.gender = gender;
    }
    //get accessor

    public int getId() {
        return this.id;
    }
    public void setId(int value) {
        this.id = value;
    }
    public String getName() {
        return this.name;
    }
    public void setName(String value) {
        this.name = value;
    }
    public boolean isMale() {
        return this.gender;
    }
    public void setMale(boolean value) {
        this.gender = value;
    }
    //phuong thuc nhap
    public void scanInfo() {
        Scanner input = new Scanner(System.in);
        System.out.print("Enter ID:");
        this.id = input.nextInt();
        System.out.print("Enter Name:");
        this.name = input.nextLine();
        System.out.print("Enter Gender:");
        this.gender = input.nextBoolean();
    }
    public void printInfo() {
        System.out.println("-----------------------------------");
        System.out.println("| ID | Name | Male |");
        System.out.printf("| %d | %s | %b |\n", this.id, this.name, this.gender);
    }
}
```

```java
public class Test
{

 public static void main(String[] args) {

//tao doi tuong cua lop Person
 Person p=new Person();
//goi phuong thuc cua doi tuong Person
 p.scanInfo();
 p.printInfo();
 }
}
```

2. Write scanInfo() and print intInfo() function outside of Person class, fix the error to make the program run with the result as shown below:

```
20      public class Person {
21      //khai bao cac truong(field)
22          private int id;
23          private String name;
24          private boolean gender;
25          public Person(int id, String name, boolean gender) {
26              this.id = id;
27              this.name = name;
28              this.gender = gender;
29          }
30          //get accessor
31
32          public int getId() {
33              return this.id;
34          }
35          public void setId(int value) {
36              this.id = value;
37          }
38          public String getName() {
39              return this.name;
40          }
41          public void setName(String value) {
42              this.name = value;
43          }
44          public boolean isMale() {
45              return this.gender;
46          }
47          public void setMale(boolean value) {
48              this.gender = value;
49          }
```

```
13  public class Test {
14
15      public static void main(String[] args) {
16
17  //tao doi tuong cua lop Person
18          Person p = new Person();
19          p.scanInfo();
20          p.printInfo();
21      }
22
23      public void scanInfo() {
24          Scanner input = new Scanner(System.in);
25          System.out.print("Enter ID:");
26          int id = input.nextInt();
27          System.out.print("Enter Name:");
28          String name = input.nextLine();
29          System.out.print("Enter Gender:");
30          boolean gender = input.nextBoolean();
31      }
32
33      public void printInfo() {
34          System.out.println("-----------------------------------");
35          System.out.println("| ID | Name | Male |");
            System.out.printf("| %d | %s | %b |\n", this.id, this.name, this.gender);
37      }
38
39  }
```

main

```
run:
Enter ID:1
Enter Name:trang
Enter Gender:true
-------------------------------------
| ID | Name | Male |
| 1 | trang | true |
```

3. Use the code of the exercise 2 to write additional code to fulfill the following requirements:

- In class Test, initialize 2 more objects of Person class (Note: use constructor with value initialization arguments for Person class properties);

Example: Person p=new Person (01,"Nguyen Van A", true);

- Declare an array named perArr with length = 4, assign the above 2 objects to the first 2 elements of the array;
- Write code allows the user to enter values for the remaining 2 elements of the array, traverse the array, and print out the elements of the array.

4. Use the code of the exercise 2 to write additional code to fulfill the following requirements:

- In class Test, Declare an ArrayList type of Person: initialize 2 more objects of Person class (Note: use constructor with value initialization arguments for Person class properties), use method add () for store above 2 objects in ArrayList;
- Write code allow user input data and initialize 2 more person objects save to the ArrayList;
- Write function sort ArrayList by name only (Note: Use only the knowledge that you have learned)
- Write function search an object in Array List by name ((Note: Use only the knowledge that you have learned).

IV. Rubric

Criteria	Score
Lesson 1	1
Lesson 2	2
Lesson 3	3
Lesson 4	4
Sum	10