OOPM Lab
Lab Assingment number 5

Name: Aamir Ansari **Batch:** A **Roll no.** 01

Aim: Write a JAVA program to implement the concept of Final variable

Problem statement: Display PRN numbers of 10 direct diploma students who are taking admission in VESIT for the current academic year. (Hint: use array of objects and final variable)

Theory:

1. Final Keyword:

   In the Java programming language, the final keyword is used in several contexts to define an entity that can only be assigned once.
   Final keyword can be used along with variables, methods and classes.
   A) final variable
   B) final method
   C) final class

2. Define final variable and blank final variable with example

   A) Final variables are nothing but constants.
   B) We cannot change the value of a final variable once it is initialized.
   C) It is good practice to represent final variables in all uppercase, using underscore to separate words.
   D) If final variable is not initialized then it is called as Blank Final Variable.
   E) Final variables can be static as well.

   Example:

```
//a final variable
final int LIMIT = 5;

// a blank final variable
final int LIMIT;

// a final static variable PI
static final double PI = 3.14;

// a blank final static variable
static final double PI;
```

3. Why and when to use final and blank final variables

A) We cannot change the value of a final variable once assigned.
B) Hence final variables must be used only for the values that we want to remain constant throughout the execution of program.
C) Lets say we have an employee class which is having a field called EmpID.
D) Since EmpID should not be changed once the employee is appointed, we can declare it as a final variable in a class, but we cannot initialize EmpID in advance for all the employees.
E) In such case we can declare EmpID variable as blank final and we initialize this value during object creation.

4. Explain the final method and final class with example

A) Final Method

1. When a method is declared with final keyword, it is called a final method.
2. A final method cannot be overridden.
3. Which means even though a sub class can call the final method of parent class without any issues but it cannot override it.
4. We must declare methods with final keyword for which we required to follow the same implementation throughout all the derived classes.
   Example:

```
class Bike {
final void run(){
          System.out.println("running");
     }
}

class Honda extends Bike {
     void run() {
          System.out.println("running safely with 100kmph");
     }
      public static void main(String args[]) {
           Honda obj = new Honda();
           obj.run();
      }
}
// gives compilation error as final method can not be overridden
```

B) Final Class:

1. When a class is declared with final keyword, it is called a final class.

2. A final class cannot be extended(inherited).
3. There are two uses of a final class:
    1. One is definitely to prevent inheritance, as final classes cannot be extended.
    2. The other use of final with classes is to create an immutable class.
4. For example, all Wrapper Classes like Integer, Float etc. and String class are final classes and are immutable too.

Example:

```
final class Bike{}

class Honda extends Bike {
    void run() {
        System.out.println("running safely with 100kmph");
    }
    public static void main(String args[]) {
        Honda obj = new Honda1();
        obj.run();
    }
}

 // gives compilation error as final class can not be extended
```

```
// code
import java.util.*;
```

```
class DiplomaStudent {
    // declaration of blank final variable
    final long PRN;

    DiplomaStudent(long val) {
        PRN = val;
    }

    void display(int number) {
        System.out.println("* PRN of Student "+number+" is :  "+PRN+"  *");
    }
}

class Final {
    public static void main(String args[]) {

        Scanner sc = new Scanner(System.in);
        long studentPRN=0;
        DiplomaStudent students[] = new DiplomaStudent[10];

        // input
        for (int i=0 ; i<10 ; i++) {
            System.out.print("Enter PRN number of Student number "+(i+1)+" :  ");
            studentPRN = sc.nextLong();
            students[i] = new DiplomaStudent(studentPRN);
        }

        // display
        System.out.println();
        System.out.println("************************************");
        for (int i=0 ; i<10 ; i++) {
            students[i].display(i+1);
        }
        System.out.println("************************************");
    }
}
```

// output

```
E:\Aamir\Sem-3\LabWork - Assignments\OOPM\Lab Assignment 5>javac Final.java

E:\Aamir\Sem-3\LabWork - Assignments\OOPM\Lab Assignment 5>java Final
Enter PRN number of Student number 1 :  2019001
Enter PRN number of Student number 2 :  2019002
Enter PRN number of Student number 3 :  2019003
Enter PRN number of Student number 4 :  2019004
Enter PRN number of Student number 5 :  2019005
Enter PRN number of Student number 6 :  2019006
Enter PRN number of Student number 7 :  2019007
Enter PRN number of Student number 8 :  2019008
Enter PRN number of Student number 9 :  2019009
Enter PRN number of Student number 10 :  2019010
**********************************
* PRN of Student 1 is :  2019001  *
* PRN of Student 2 is :  2019002  *
* PRN of Student 3 is :  2019003  *
* PRN of Student 4 is :  2019004  *
* PRN of Student 5 is :  2019005  *
* PRN of Student 6 is :  2019006  *
* PRN of Student 7 is :  2019007  *
* PRN of Student 8 is :  2019008  *
* PRN of Student 9 is :  2019009  *
* PRN of Student 10 is :  2019010  *
**********************************



E:\Aamir\Sem-3\LabWork - Assignments\OOPM\Lab Assignment 5>javac Final.java

E:\Aamir\Sem-3\LabWork - Assignments\OOPM\Lab Assignment 5>java Final
Enter PRN number of Student number 1 :  2077001
Enter PRN number of Student number 2 :  2077002
Enter PRN number of Student number 3 :  2077003
Enter PRN number of Student number 4 :  2077004
Enter PRN number of Student number 5 :  2077005
Enter PRN number of Student number 6 :  2077006
Enter PRN number of Student number 7 :  2077007
Enter PRN number of Student number 8 :  2077008
Enter PRN number of Student number 9 :  2077009
Enter PRN number of Student number 10 :  2077010

**********************************
* PRN of Student 1 is :  2077001  *
* PRN of Student 2 is :  2077002  *
* PRN of Student 3 is :  2077003  *
* PRN of Student 4 is :  2077004  *
* PRN of Student 5 is :  2077005  *
* PRN of Student 6 is :  2077006  *
* PRN of Student 7 is :  2077007  *
* PRN of Student 8 is :  2077008  *
* PRN of Student 9 is :  2077009  *
* PRN of Student 10 is :  2077010  *
**********************************
```