PG DAC–March 2023
C-DAC THIRUVANANTHAPURAM
JAVA- LAB 12

1. Write a java program to Create arrays of Integer, Double and character using Generic methods.

CreateGen.java | CreateGenMain.java

```
1  package com.javaassignment121.main;
2
3  public class CreateGen {
4      public static <T> void show(T[] elements) {
5          for(T elem : elements)
6              System.out.println(elem);
7      }
8  }
9
```

CreateGen.java | CreateGenMain.java

```
1  package com.javaassignment121.main;
2
3  public class CreateGenMain {
4
5      public static void main(String[] args) {
6          Character[] cArray = {'a','e','i','o','u'};
7          Integer[] iArray = {1,2,3,4,5};
8          Double[] dArray  = {1.2,2.3,4.5,6.7};
9          System.out.println("Arrays of Integer are: ");
10         CreateGen.show(cArray);
11         System.out.println("Arrays of Double are:");
12         CreateGen.show(iArray);
13         System.out.println("Arrays of character are:");
14         CreateGen.show(dArray);
15     }
16 }
17
```

Console

```
<terminated> CreateGenMain [Java Application] D
Arrays of Integer are:
a
e
i
o
u
Arrays of Double are:
1
2
3
4
5
Arrays of character are:
1.2
2.3
4.5
6.7
```

Q2. Write a generic method to exchange the positions of two elements in an array .

CreateGen.java | CreateGenMain.java | GenericExchange.java

```
1  package com.javaassignment122.main;
2
3  import java.util.Arrays;
4
5  public class GenericExchange {
6
7      public static <T> void show(T[] arr, int a, int b) {
8          T temp = arr[a];
9          arr[a]= arr[b];
10         arr[b]=temp;
11     }
12     public static void main(String[] args) {
13         Integer arr[] = {1, 3, 4, 6, 8};
14         System.out.println("Original element position:");
15         System.out.println(Arrays.toString(arr));
16         System.out.println("New element position:");
17         show(arr,0,3);
18         System.out.println(Arrays.toString(arr));
19     }
20 }
21
```

Console

```
<terminated> GenericExchange [Java Application] D:\
Original element position:
[1, 3, 4, 6, 8]
New element position:
[6, 3, 4, 1, 8]
```

Q3. Create a list of java defined wrapper classes and perform insert/delete/search operations.

GenericExchange.java | Student.java | StudentMain.java | *WrapperList.java

```
1  package com.javaassignment123.main;
2  import java.util.ArrayList;
3  import java.util.List;
4
5  public class WrapperList {
6      public static void main(String[] args) {
7      List<Object> ref = new ArrayList<>();
8      System.out.println("Inserting the elements of "
9              + "diff wrapper class");
10     ref.add(40);
11     ref.add('B');
12     ref.add(true);
13     ref.add("Hello");
14
15     for(Object obj: ref)
16         System.out.println(obj);
17
18     System.out.println("After deleting the "
19             + "elements from the list");
20
21     ref.remove(Integer.valueOf(40));
22     for(Object obj: ref)
23         System.out.println(obj);
24
25     System.out.println(ref.contains('B'));
26 }
27 }
```

Console

```
<terminated> WrapperList [Java Application] D:\Eclipse\eclipse\plugins\org.eclipse.justj.op
Inserting the elements of diff wrapper class
40
B
true
Hello
After deleting the elements from the list
B
true
Hello
true
```

Q4. Create a class named Student with following Data members - regno, name, marks, Create 5 Student objects and add it to an ArrayList in a way that students with same mark appears(are added) only once in the list . Also display the details of all the students.

WrapperList.java | GenericExchange.java | *Student.java | *StudentMain.java

```java
package com.javaassignment124.main;

public class Student {
        private String name;
        private int regno;
        private int marks;
    public Student(String name, int regno, int marks){
        this.name = name;
        this.regno = regno;
        this.marks = marks;
}
    public Student() {
    }
    public String getName() {
        return name;
    }
    public void setName(String name) {
        this.name = name;
    }
    public int getRegno() {
        return regno;
    }
    public void setRegno(int regno) {
        this.regno = regno;
    }
    public int getMarks() {
        return marks;
    }
    public void setMarks(int marks) {
        this.marks = marks;
    }
```

```java
@Override
public String toString() {
    return "Reg No: " + regno + ", Name: " + name + ", Marks: " + marks;
}
@Override
public boolean equals(Object obj) {
 Student s = (Student) obj ;// DownCasting
return this.marks == s.marks;
    }
}
```

WrapperList.java | GenericExchange.java | *Student.java | *StudentMain.java

```java
package com.javaassignment124.main;
import java.util.ArrayList;
import java.util.List;

public class StudentMain {

    public static void main(String[] args) {
            List<Student> studentlist = new ArrayList<>();

            Student s1 = new Student("Monika", 101, 90);
            Student s2 = new Student("Ankit", 102, 80);
            Student s3 = new Student("Kunal", 103, 85);
            Student s4 = new Student("Amar", 104, 75);
            Student s5 = new Student("Amit", 105, 80);

            if(!studentlist.contains(s1)){
                studentlist.add(s1);        }
            if(!studentlist.contains(s2)){
                studentlist.add(s2);        }
            if(!studentlist.contains(s3)){
                studentlist.add(s3);        }
            if(!studentlist.contains(s4)){
                studentlist.add(s4);        }
            if(!studentlist.contains(s5)){
                studentlist.add(s5);        }

            System.out.println("Details of all the students are: ");
            for(Student s: studentlist)
                System.out.println(s.toString());
    }
}
```

Console

<terminated> StudentMain [Java Application] D:\Eclipse\eclipse\plugins

```
Details of all the students are:
Reg No: 101, Name: Monika, Marks: 90
Reg No: 102, Name: Ankit, Marks: 80
Reg No: 103, Name: Kunal, Marks: 85
Reg No: 104, Name: Amar, Marks: 75
Reg No: 105, Name: Amit, Marks: 80
```