CS210 Programming Assignment #4
Due: Monday, 11/28/16, 11:59 pm

This assignment focuses on array structures and class. Be sure to include a short comment at the beginning of your program as well as a short comment for each method describing what it does. For this assignment you are limited to the language features in Chapters 1-7 shown in lecture or the textbook. You have to submit 10 java files. Do not change name of classes. (q1~q9: 2points each(no partial points), q10: 7Points)

1. Write a Java program to calculate average value of an array elements.

```
public class ex1AverageValue {
public static void main(String[] args) {
  int[] numbers = new int[]{10, 20, 30, 40, -50, 60, -70};




    System.out.println("Average value of the array elements is : " + average);
   }
}
// Average value of the array elements is : 5.0
```

2. Write a Java program to find the index of an array element.

```
public class ex2FindIndex {
       public static int  findIndex (int[] my_array, int t) {




    }
    public static void main(String[] args) {
      int[] my_array = new int[] {25, 10, 55, 65, 36, 92, 77, 8, 13, 79};
      System.out.println("Index position of 55 is: " + findIndex(my_array, 55));
      System.out.println("Index position of 13 is: " + findIndex(my_array, 13));
       }
}
//Index position of 55 is: 2
//Index position of 13 is: 8
```

3. Write a Java program to copy an array by iterating the array.

```
import java.util.Arrays;
public class ex3CopyArray {
 public static void main(String[] args) {
   int[] my_array = new int[]{25, 10, 55, 65, 36, 92, 77, 8, 13, 79};
   int[] new_array = new int[10];
   System.out.println("Source Array : "+Arrays.toString(my_array));
```

```
 }
 }
//Source Array : [25, 10, 55, 65, 36, 92, 77, 8, 13, 79]
//New Array: [25, 10, 55, 65, 36, 92, 77, 8, 13, 79]
```

4. Write a Java program to insert an element (specific position) into an array.

```
import java.util.Arrays;
public class ex4Insert {
public static void main(String[] args) {

   int[] my_array =new int[] {25, 10, 55, 65, 36, 92, 77, 8, 13, 79};
   // Insert an element in 3rd position of the array (index->3, value->12)
   int Index_position = 3;
   int newValue    = 12;
   System.out.println("Original Array : "+Arrays.toString(my_array));




   System.out.println("New Array: "+Arrays.toString(my_array));
 }
 }
//Original Array : [25, 10, 55, 65, 36, 92, 77, 8, 13, 79]
//New Array: [25, 10, 55, 12, 65, 36, 92, 77, 8, 13]
```

5. Write a Java program to find the maximum and minimum value of an array.

```
import java.util.Arrays;
public class ex5MinMax {
  static int max;
  static int min;
    public static void max_min(int my_array[]) {




    }

    public static void main(String[] args) {
        int[] my_array = {25, 10, 55, 65, 36, 92, 77, 8, 13, 79};
        max_min(my_array);
        System.out.println(" Original Array: "+Arrays.toString(my_array));
        System.out.println(" Maximum value for the above array = " + max);
        System.out.println(" Minimum value for the above array = " + min);
    }
}
//Original Array: [25, 10, 55, 65, 36, 92, 77, 8, 13, 79]
//Maximum value for the above array = 92
//Minimum value for the above array = 8
```

6. Write a Java program to reverse an array of integer values.

```
import java.util.Arrays;
public class ex6Reverse {
```

```
  int[] my_array1 = {2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018,
2019};
  System.out.println("Original array : "+Arrays.toString(my_array1));




    System.out.println("Reverse array : "+Arrays.toString(my_array1));
 }
}
//Original array : [2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019]
//Reverse array : [2019, 2018, 2017, 2016, 2015, 2014, 2013, 2012, 2011, 2010]
```

7. Write a Java program to find the duplicate values of an array of integer values.

```
import java.util.Arrays;
public class ex7DuplicateValue {
  public static void main(String[] args)
    {
        int[] my_array = {1, 2, 3, 3, 4, 5, 6, 2};




    }
}
//Duplicate Element : 2
//Duplicate Element : 3
```

8. Write a Java program to find the duplicate values of an array of string values.

```
public class ex8DuplicateString {
public static void main(String[] args)
    {
      String[] my_array = {"Wilson", "Sherman", "Lynch", "Chancellor", "Graham",
"Wilson", "Lynch"};




      }
}
//Duplicate Element is : Wilson
//Duplicate Element is : Lynch
```

9. Write a Java program to find the TRIPLE duplicate values of an array of string values.

```
public class ex9TripleDuplicateString {
public static void main(String[] args)
    {
      String[] my_array = {"Wilson", "Sherman", "Lynch", "Wilson", "Graham",
"Wilson", "Lynch"};
```

```
      }
}
//Triple Duplicate Element is : Wilson
```

10. Complete the following balls.java program as we discussed at the class (up-down only). You have to use the class movingObject.

```
import java.awt. * ;  import java.util. * ;
public class balls {
   public static int width = 800;  public static int height = 600;
   public static int howMany = 20; public static int ballSizeMax = 70;
   public static

 public static void main(String[] args) {
      DrawingPanel panel = new DrawingPanel(width, height);
      panel.setBackground(Color.LIGHT_GRAY);
      Graphics g = panel.getGraphics();
      getInitialStatus();
    while (true) {
       for (int i = 0; i < howMany; i++) {
       g.setColor(




      }
   panel.sleep(50);
   g.clearRect(0, 0, width, height);
   }
}
public static void getInitialStatus() {
  Random rand = new Random();
for (int i = 0; i < howMany; i++) {
  ball[i] = new movingObject();
  ball[i].size=rand.nextInt(ballSizeMax) + 10;







 }
}

 public static Color getColor() {



      return myColor;

   }
 }
}
```

```
 int x;
 int y;
 int size;
 int speed;
 String direction;
 Color color;
}
```