Assignment 6

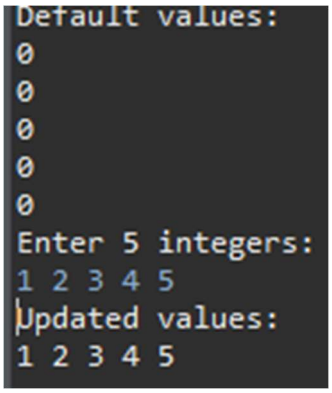
1. Declare a single-dimensional array of 5 integers inside the `main` method. Traverse the array to print the default values. Then accept records from the user and print the updated values of the array.

```
package org.question;
import java.util.Scanner;

public class Q1{
   public static void main(String[] args){
      int[] arr = new int[5];

      System.out.println ("Default values:");
      for (int i=0; i<arr.length; i++){
         System.out.println(arr[i]);
      }

      Scanner sc = new Scanner(System.in);
      System.out.println ("Enter 5 integers:");
      for (int i=0; i<arr.length; i++){
         arr[i] = sc.nextInt();
      }
      System.out.println("Updated values:");
      for (int i=0; i<arr.length; i++){
         System.out.print(arr[i]+ " ");
      }
      sc.close();
   }
}
```



2. Declare a single-dimensional array of 5 integers inside the `main` method. Define a method named `acceptRecord` to get input from the terminal into the array and another method named `printRecord` to print the state of the array to the terminal.

```
package org.question;
import java.util.Scanner;

public class Q2{
```

```
    public static void main(String[] args){
        int[] arr = new int[5];

        acceptRecord (arr);
        printRecord (arr);
    }

    public static void acceptRecord (int[] arr){
        Scanner sc = new Scanner (System.in);
        System.out.println ("Enter 5 integers:");

        for (int i=0; i<arr.length; i++) {
            arr[i] = sc.nextInt();
        }

        sc.close();
    }

    public static void printRecord(int[] arr){
        System.out.println("Array values:");

        for (int i = 0; i < arr.length; i++){
            System.out.println(arr[i]);
        }
    }
}
```

```
Enter 5 integers:
12 5 8 34 11
Array values:
12 5 8 34 11
```

3. Write a program to find the maximum and minimum values in a single-dimensional array of integers.

```
package org.question;
public class Q3{
    public static void main(String[] args){
        int[] arr = {21, 45, 11, 89, 34};

        int max = findMax(arr);
        int min = findMin(arr);

        System.out.println ("Maximum value: " + max);
        System.out.println ("Minimum value: " + min);
    }
```

```
    public static int findMax(int[] arr){
        int max = arr[0];
        for (int i=1; i<arr.length; i++){
            if (arr[i] > max) {
                max = arr[i];
            }
        }
        return max;
    }

    public static int findMin(int[] arr){
        int min = arr[0];
        for (int i = 1; i < arr.length; i++){
            if (arr[i] < min){
                min = arr[i];
            }
        }
        return min;
    }
}
```

```
Maximum value: 89
Minimum value: 11
```

4. Write a program to remove duplicate elements from a single-dimensional array of integers.

```
package org.question;
import java.util.Arrays;

public class Q4{
    public static void main(String[] args){
        int[] arr = {12, 45, 12, 89, 45, 34};
        int[] uniqueArr = removeDuplicates(arr);

        System.out.println("Array without duplicates: " + Arrays.toString(uniqueArr));
    }

    public static int[] removeDuplicates(int[] arr){
        int[] temp = new int[arr.length];
        int uniqueCount = 0;

        for (int i=0; i<arr.length; i++) {
            boolean isDuplicate = false;
```

```
        for (int j=0; j<uniqueCount; j++){
            if (arr[i] == temp[j]){
                isDuplicate = true;
                break;
            }
        }
        if (!isDuplicate){
            temp[uniqueCount++] = arr[i];
        }
    }

    return Arrays.copyOf(temp, uniqueCount);
  }
}
```

```
Array without duplicates: [12, 45, 89, 34]
```

5. Write a program to find the intersection of two single-dimensional arrays.

```
package org.question;

public class Q5{
  public static void main(String[] args){

    int[] array1 = {1, 2, 3, 4, 5};
    int[] array2 = {4, 5, 6, 7, 8};

    System.out.print("Intersection of the two arrays: ");

    for(int i = 0; i < array1.length; i++){
      for(int j = 0; j < array2.length; j++){
        if(array1[i] == array2[j]){
          System.out.print(array1[i] + " ");
          break;
        }
      }
    }
  }
}
```

```
Intersection of the two arrays: 4 5
```

6. Write a program to find the missing number in an array of integers ranging from 1 to N.

```
package org.question;

public class Q6{
   public static void main(String[] args){
      int[] array = {1, 2, 4, 5};
      int N = 5;

      int expectedSum = N * (N + 1) / 2;     //sum of no. from 1 to N
      int actualSum = 0; // initially 0

      for(int i=0; i<array.length; i++){
         actualSum += array[i];
      }

      int missingNumber = expectedSum - actualSum;
      System.out.println ("Missing number is: " + missingNumber);
   }
}
```

```
Missing number is: 3
```

7. Declare a single-dimensional array as a field inside a class and instantiate it inside the class constructor. Define methods named `acceptRecord` and `printRecord` within the class and test their functionality.

Class File 1:

```
package org.question;
import java.util.Scanner;

public class ArrayOperations{
   private int[] array;

   public ArrayOperations (int size){
      array = new int[size];
   }

   public void acceptRecord(){
      try (Scanner scanner = new Scanner(System.in)){
         System.out.println ("Enter " + array.length + " elements:");
         for (int i = 0; i < array.length; i++) {
            array[i] = scanner.nextInt();
         }
      }
   }

   public void printRecord(){
```

```
        System.out.print ("Array elements: ");
        for (int value : array){
            System.out.print(value + " ");
        }
        System.out.println();
    }
}
```

Class File 2:

```
package org.question;

public class ArrayTest{
    public static void main (String[] args){
        ArrayOperations arrayOps = new ArrayOperations(5);
        arrayOps.acceptRecord();
        arrayOps.printRecord();
    }
}
```

```
Enter 5 elements:
2 4 1 7 8
Array elements: 2 4 1 7 8
```

8. Modify the previous assignment to use getter and setter methods instead of `acceptRecord` and `printRecord`.

Class File 1:

```
package org.question;
import java.util.Scanner;

public class ArrayOperations{
    private int[] array;

    public ArrayOperations(int size){
        array = new int[size];
    }

    public int[] getArray(){
        return array;
    }

    public void setArray(int[] array){
        if(array.length == this.array.length){
            this.array = array;
        }
```

```
        else{
            System.out.println ("Input array size does not match.");
        }
    }

    public void printRecord(){
        System.out.print ("Array elements: ");
        for(int value : array){
            System.out.print (value + " ");
        }
        System.out.println();
    }
}
```

Class File 2:

```
package org.question;

import java.util.Scanner;

public class ArrayTest{
    public static void main(String[] args){
        ArrayOperations arrayOps = new ArrayOperations(5);

        Scanner scanner = new Scanner(System.in);

        int[] inputArray = new int[5];
        System.out.println ("Enter " + inputArray.length + " elements:");

        for (int i=0; i<inputArray.length; i++){
            inputArray[i] = scanner.nextInt();
        }


        scanner.close();

        arrayOps.setArray(inputArray);
        arrayOps.printRecord();
    }
}
```

```
Enter 5 elements:

31 41 50 83 56
Array elements: 31 41 50 83 56
```

9. You need to implement a system to manage airplane seat assignments. The airplane has seats arranged in rows and columns. Implement functionalities to:

- Initialize the seating arrangement with a given number of rows and columns.
- Book a seat to mark it as occupied.
- Cancel a booking to mark a seat as available.
- Check seat availability to determine if a specific seat is available.
- Display the current seating chart.