

# ASSIGNMENT NO 6

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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.

```
import java.util.Scanner;

public class p1 {
    public static void main(String args[]) {

        int [] numbers = new int [5];
        System.out.println("Default values of the Array : ");

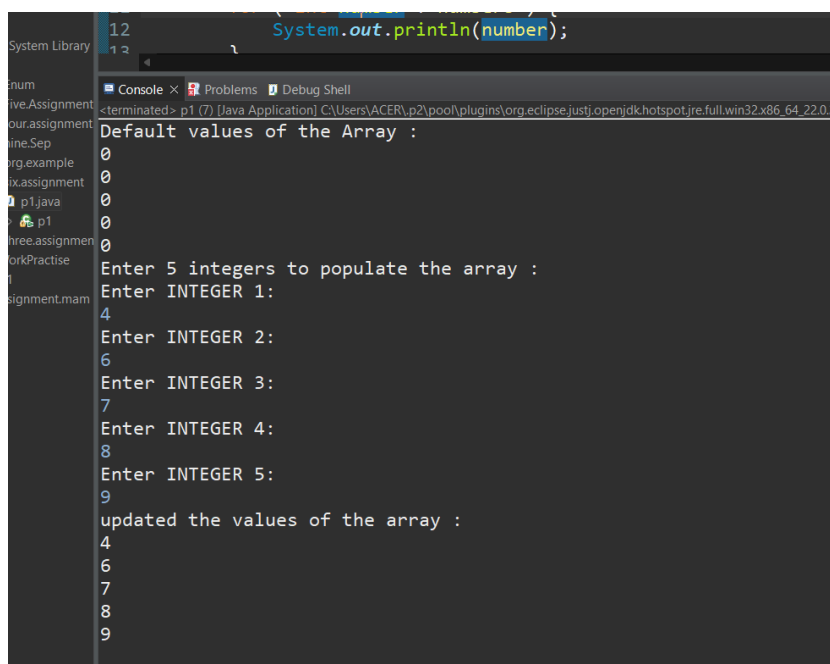
        for ( int number : numbers ) {
            System.out.println(number);
        }

        Scanner sc = new Scanner(System.in);
        System.out.println("Enter 5 integers to populate the array : ");

        for(int i =0 ; i < numbers.length ; i++) {
            System.out.println("Enter INTEGER "+(i+1)+" : ");
            numbers[i]= sc.nextInt();
        }

        System.out.println("updated the values of the array : ");

        for(int number : numbers) {
            System.out.println(number);
        }
    }
}
```



```
System.out.println(number);
12
13
System Library
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ive.Assignment
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Console x Problems Debug Shell
terminated> p1 (7) [Java Application] C:\Users\ACER\p2\pool\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64.22.0.2
Default values of the Array :
0
0
0
0
0
Enter 5 integers to populate the array :
Enter INTEGER 1:
4
Enter INTEGER 2:
6
Enter INTEGER 3:
7
Enter INTEGER 4:
8
Enter INTEGER 5:
9
updated the values of the array :
4
6
7
8
9
```

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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.

```
import java.util.Scanner;

public class p2 {

    private static int[] numbers = new int[5];

    public static void main(String args[]) {

        acceptRecord();
        printRecord();
    }

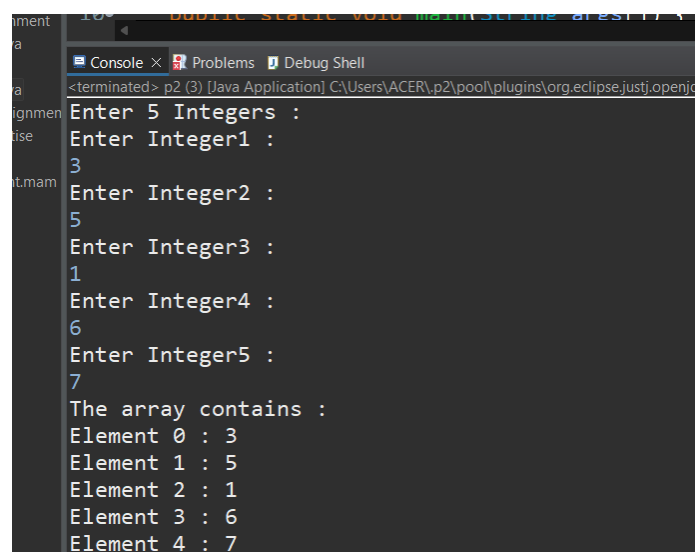
    public static void acceptRecord() {
        Scanner sc = new Scanner(System.in);

        System.out.println("Enter 5 Integers : ");

        for(int i= 0 ; i < numbers.length ; i++) {
            System.out.println("Enter Integer"+(i+1)+" : ");

            numbers[i]= sc.nextInt();
        }
    }
}
```

```
    private static void printRecord() {
        System.out.println("The array contains : ");
        for(int i =0 ; i < numbers.length ;i++) {
            System.out.println("Element "+ i+ " : "+numbers[i] );
        }
    }
}
```



The screenshot shows the Eclipse IDE interface with the 'Console' tab selected. The output of the program is as follows:

```
<terminated> p2 (3) [Java Application] C:\Users\ACER\.p2\pool\plugins\org.eclipse.justj.openjdk
Enter 5 Integers :
Enter Integer1 :
3
Enter Integer2 :
5
Enter Integer3 :
1
Enter Integer4 :
6
Enter Integer5 :
7
The array contains :
Element 0 : 3
Element 1 : 5
Element 2 : 1
Element 3 : 6
Element 4 : 7
```

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

```
import java.util.Scanner;

public class p3 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the number of elements in the array: ");
        int n = scanner.nextInt();

        int[] array = new int[n];

        System.out.println("Enter " + n + " integers:");
        for (int i = 0; i < n; i++) {
            array[i] = scanner.nextInt();
        }

        int max = array[0];
        int min = array[0];
```

```
        for (int i = 1; i < n; i++) {
            if (array[i] > max) {
                max = array[i];
            }
            if (array[i] < min) {
                min = array[i];
            }
        }

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

        scanner.close();
    }
}
```

```
17     }
18
19     int max = array[0];
```

Console × Problems Debug Shell

<terminated> p3 (4) [Java Application] C:\Users\ACER\p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86\_64

Enter the number of elements in the array: 5

Enter 5 integers:

4

5

5

3

3

Maximum value: 5

Minimum value: 3

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

```
import java.util.Scanner;

public class p4 {

    public static int removeElements(int arr[], int n) {
        if (n == 0 || n == 1) {
            return n;
        }
        int[] temp = new int[n];
        int j = 0;
        for (int i = 0; i < n - 1; i++) {
            if (arr[i] != arr[i + 1]) {
                temp[j++] = arr[i];
            }
        }
        temp[j++] = arr[n - 1];

        for (int i = 0; i < j; i++) {
            arr[i] = temp[i];
        }
        return j;
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        System.out.print("Enter the number of elements in the array: ");
        int n = sc.nextInt();

        int[] arr = new int[n];
        System.out.println("Enter " + n + " elements in sorted order (duplicates allowed):");
        for (int i = 0; i < n; i++) {
            System.out.print("Element " + (i + 1) + ": ");
            arr[i] = sc.nextInt();
        }

        int length = removeElements(arr, n);

        System.out.println("Array after removing duplicates:");
        for (int i = 0; i < length; i++) {
            System.out.print(arr[i] + " ");
        }
    }
}
```

```
ava Console x Problems Debug Shell
ssignmen <terminated> p4 (2) [Java Application] C:\Users\ACER\p2\pool\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64_22.0.2.v20240802-1
actise
ent.mam Enter the number of elements in the array: 6
Enter 6 elements in sorted order (duplicates allowed):
Element 1: 3
Element 2: 3
Element 3: 5
Element 4: 7
Element 5: 7
Element 6: 8
Array after removing duplicates:
3 5 7 8
```

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

```
import java.util.HashSet;
import java.util.Set;
import java.util.Scanner;
import java.util.Arrays;

public class p5 {

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.println("Enter the number of elements for the first array:");
        int size1 = scanner.nextInt();
        int[] array1 = new int[size1];
        System.out.println("Enter the elements of the first array:");
        for (int i = 0; i < size1; i++) {
            array1[i] = scanner.nextInt();
        }

        System.out.println("Enter the number of elements for the second array:");
        int size2 = scanner.nextInt();
        int[] array2 = new int[size2];
        System.out.println("Enter the elements of the second array:");
        for (int i = 0; i < size2; i++) {
            array2[i] = scanner.nextInt();
        }

        int[] intersection = findIntersection(array1, array2);
        System.out.println("Intersection of the two arrays: " + Arrays.toString(intersection));
    }

    public static int[] findIntersection(int[] array1, int[] array2) {
        Set<Integer> set1 = new HashSet<>();
        Set<Integer> intersection = new HashSet<>();

        for (int num : array1) {
            set1.add(num);
        }

        for (int num : array2) {
            if (set1.contains(num)) {
                intersection.add(num);
            }
        }

        int[] result = new int[intersection.size()];
        int index = 0;
        for (int num : intersection) {
            result[index++] = num;
        }

        return result;
    }
}
```

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```
Console x Problems Debug Shell
<terminated> p5 (3) [Java Application] C:\Users\ACER\p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_
5
Enter the elements of the first array:
3
5
9
9
8
Enter the number of elements for the second array:
5
Enter the elements of the second array:
1
6
8
3
0
Intersection of the two arrays: [3, 8]
```

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

```
import java.util.Scanner;

public class p5 {

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

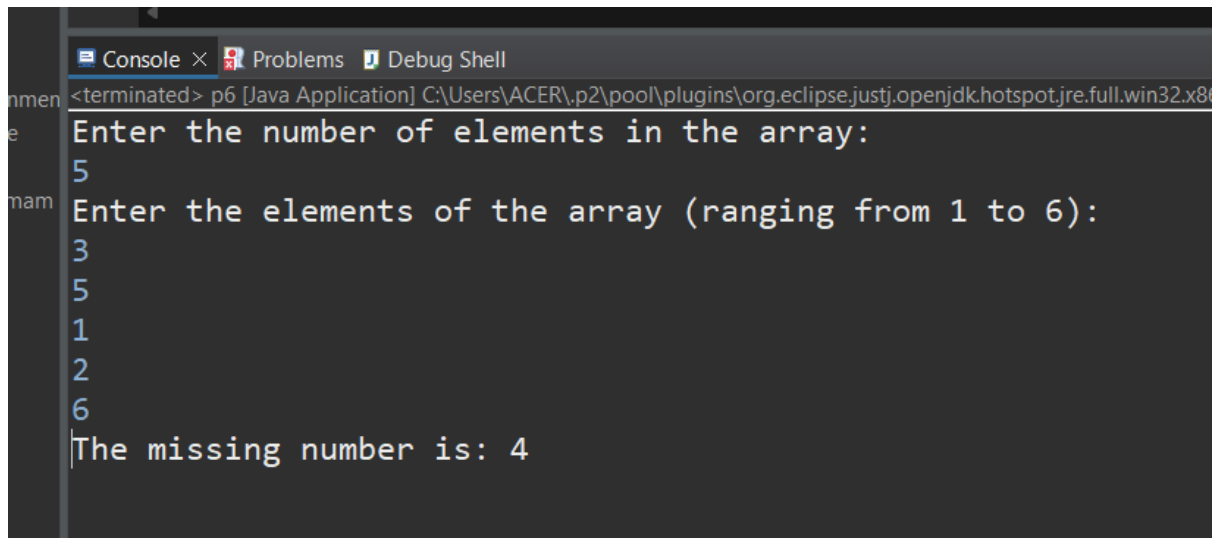
        System.out.println("Enter the number of elements in the array:");
        int n = scanner.nextInt();
        int[] array = new int[n];

        System.out.println("Enter the elements of the array (ranging from 1 to " + (n + 1) + "):");
        for (int i = 0; i < n; i++) {
            array[i] = scanner.nextInt();
        }

        int missingNumber = findMissingNumber(array, n + 1);
        System.out.println("The missing number is: " + missingNumber);
    }

    public static int findMissingNumber(int[] array, int N) {
        int totalSum = N * (N + 1) / 2;
        int arraySum = 0;
        for (int num : array) {
            arraySum += num;
        }
        return totalSum - arraySum;
    }
}
```

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```
Console x Problems Debug Shell
<terminated> p6 [Java Application] C:\Users\ACER\p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64.jre\bin\java.exe
Enter the number of elements in the array:
5
Enter the elements of the array (ranging from 1 to 6):
3
5
1
2
6
The missing number is: 4
```

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.

```
import java.util.Scanner;

class ArrayHandler {
    private int[] array;

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

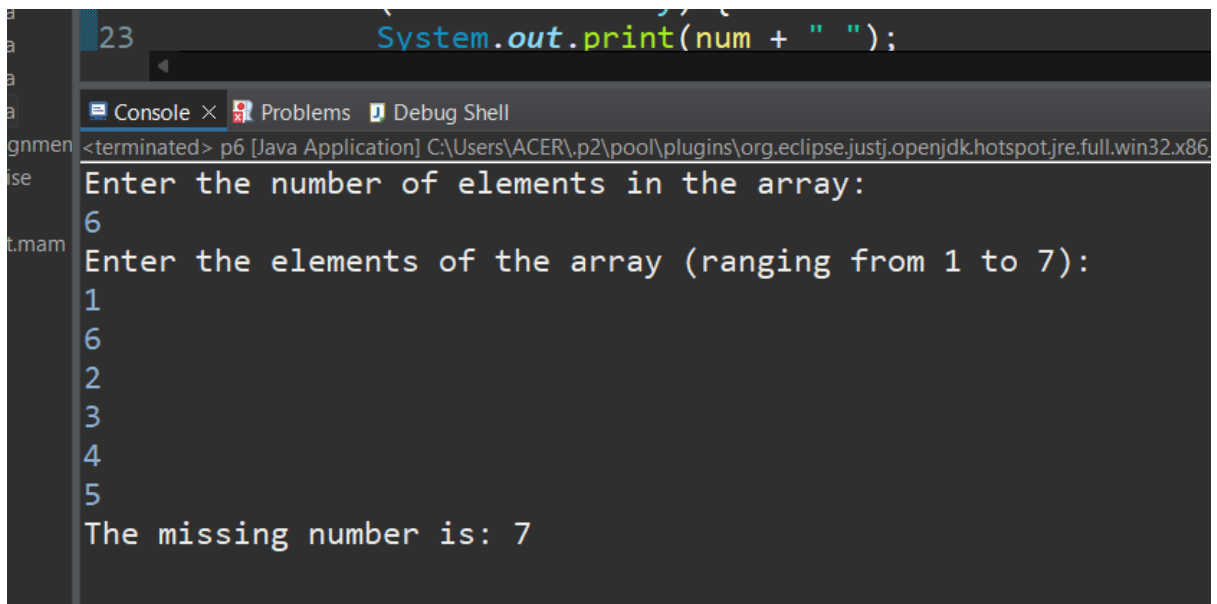
    public void acceptRecord() {
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter " + array.length + " elements:");
        for (int i = 0; i < array.length; i++) {
            array[i] = scanner.nextInt();
        }
    }

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

8.

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```
public static void main(String[] args) {  
    Scanner scanner = new Scanner(System.in);  
    System.out.println("Enter the size of the array:");  
    int size = scanner.nextInt();  
    ArrayHandler handler = new ArrayHandler(size);  
  
    handler.acceptRecord();  
    handler.printRecord();  
}
```



```
23      System.out.print(num + " ");  
Console x Problems Debug Shell  
<terminated> p6 [Java Application] C:\Users\ACER\p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86  
Enter the number of elements in the array:  
6  
Enter the elements of the array (ranging from 1 to 7):  
1  
6  
2  
3  
4  
5  
The missing number is: 7
```

9. Modify the previous assignment to use getter and setter methods instead of `acceptRecord` and `printRecord`.
10. You need to implement a system to manage airplane seat assignments. The airplane has seats arranged in rows and columns. Implement functionalities to:



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```
import java.util.Scanner;

public class AirplaneSeating {
    private char[][] seats;

    public AirplaneSeating(int rows, int columns) {
        seats = new char[rows][columns];
        for (int i = 0; i < rows; i++) {
            for (int j = 0; j < columns; j++) {
                seats[i][j] = 'A';
            }
        }
    }

    public void reserveSeat(int row, int column) {
        if (isValidSeat(row, column)) {
            if (seats[row][column] == 'A') {
                seats[row][column] = 'R';
                System.out.println("Seat (" + row + ", " + column + ") has been reserved.");
            } else {
                System.out.println("Seat (" + row + ", " + column + ") is already reserved.");
            }
        } else {
            System.out.println("Invalid seat position.");
        }
    }
}
```

```
    public void cancelReservation(int row, int column) {
        if (isValidSeat(row, column)) {
            if (seats[row][column] == 'R') {
                seats[row][column] = 'A';
                System.out.println("Reservation for seat (" + row + ", " + column + ") has been canceled.");
            } else {
                System.out.println("Seat (" + row + ", " + column + ") is not reserved.");
            }
        } else {
            System.out.println("Invalid seat position.");
        }
    }

    public void viewSeatingChart() {
        System.out.println("Seating Chart:");
        for (int i = 0; i < seats.length; i++) {
            for (int j = 0; j < seats[i].length; j++) {
                System.out.print(seats[i][j] + " ");
            }
            System.out.println();
        }
    }
}
```

```
private boolean isValidSeat(int row, int column) {
    return row >= 0 && row < seats.length && column >= 0 && column < seats[0].length;
}

public static void main(String[] args) {
    Scanner scanner = new Scanner(System.in);

    System.out.println("Enter the number of rows:");
    int rows = scanner.nextInt();
    System.out.println("Enter the number of columns:");
    int columns = scanner.nextInt();

    AirplaneSeating airplane = new AirplaneSeating(rows, columns);

    while (true) {
        System.out.println("1. Reserve a seat");
        System.out.println("2. Cancel a reservation");
        System.out.println("3. View seating chart");
        System.out.println("4. Exit");
        System.out.print("Choose an option: ");
        int choice = scanner.nextInt();
    }
}
```

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```
switch (choice) {
    case 1:
        System.out.print("Enter row and column to reserve: ");
        int reserveRow = scanner.nextInt();
        int reserveColumn = scanner.nextInt();
        airplane.reserveSeat(reserveRow, reserveColumn);
        break;
    case 2:
        System.out.print("Enter row and column to cancel: ");
        int cancelRow = scanner.nextInt();
        int cancelColumn = scanner.nextInt();
        airplane.cancelReservation(cancelRow, cancelColumn);
        break;
    case 3:
        airplane.viewSeatingChart();
        break;
    case 4:
        System.out.println("Exiting...");
        return;
    default:
        System.out.println("Invalid choice.");
}
}
```

```
55 }
56
57 public static void main(String[] args) {
58     Scanner scanner = new Scanner(System.in);
59
60     Console x; Problems Debug Shell
61 AirplaneSeating [Java Application] C:\Users\ACER\p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.win32.x86_64_22.0.2.v2024
62 Enter the number of rows:
63 7
64 Enter the number of columns:
65 6
66 1. Reserve a seat
67 2. Cancel a reservation
68 3. View seating chart
69 4. Exit
70 Choose an option: 1
71 Enter row and column to reserve: 2
72 4
73 Seat (2, 4) has been reserved.
74 1. Reserve a seat
75 2. Cancel a reservation
76 3. View seating chart
77 4. Exit
78 Choose an option:
```