

Assignment 6

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```
/*  
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.example;  
  
import java.util.Arrays;  
import java.util.Scanner;  
  
public class Que1 {  
  
    public static void main(String[] args) {  
        int[] arr = new int[5];  
        System.out.println(Arrays.toString(arr));  
        Scanner sc = new Scanner(System.in);  
  
        for(int i=0 ; i<arr.length ; i++) {  
            System.out.print("Enter array for index "+ i +" : ");  
            arr[i]=sc.nextInt();  
        }  
  
        System.out.println(Arrays.toString(arr));  
    }  
}
```

```
[0, 0, 0, 0, 0]  
Enter array for index 0 : 1  
Enter array for index 1 : 2  
Enter array for index 2 : 3  
Enter array for index 3 : 4  
Enter array for index 4 : 5  
[1, 2, 3, 4, 5]
```

```
/*  
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.example;  
  
import java.util.Arrays;  
import java.util.Scanner;  
  
class Q2{  
    private int[] arr;
```

```

private int a;

public Q2() {
    this.arr = new int[3];
}

public Q2(int size) {
    this.arr = new int[size];
}

public void acceptRecord(){
    Scanner sc = new Scanner(System.in);
    for(int i = 0 ; i<arr.length ; ++i) {
        System.out.print("Enter an array at element "+ i +" : ");
        arr[i] = sc.nextInt();
    }
}

public void printRecord(){
    System.out.print(Arrays.toString(arr));
}
}

public class Que2 {

    public static void main(String[] args) {
        Q2 q = new Q2(5);

        q.acceptRecord();
        q.printRecord();

    }
}

```

```

Enter an array at element 0 : 1
Enter an array at element 1 : 2
Enter an array at element 2 : 3
Enter an array at element 3 : 4
Enter an array at element 4 : 5
[1, 2, 3, 4, 5]

```

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

```

package org.example;

import java.util.Arrays;
import java.util.Scanner;

public class Que3 {

    public static void main(String[] args) {

```

```

int[] arr = new int[5];

Scanner sc = new Scanner(System.in);
for(int i = 0 ; i<arr.length ; ++i) {
    System.out.print("Enter an array at element "+ i + " : ");
    arr[i] = sc.nextInt();
}

int max = arr[0];
int min = arr[0];

for(int i = 0 ; i<arr.length ; i++) {

    if(max < arr[i]) {
        max = arr[i];
    }

    if(min > arr[i]) {
        min = arr[i];
    }

}
System.out.println(Arrays.toString(arr));
System.out.println("Maximum number in array is : " + max);
System.out.println("Minimum number in array is : " + min);

}

}

```

```

Enter an array at element 0 : 1
Enter an array at element 1 : 2
Enter an array at element 2 : 6
Enter an array at element 3 : 3
Enter an array at element 4 : 9
[1, 2, 6, 3, 9]
Maximum number in array is : 9
Minimum number in array is : 1

```

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

```

package org.example;

import java.util.ArrayList;
import java.util.Arrays;
public class Que4 {

    public static void main(String[] args) {

        int arr[] = {1,5,5,6,5,7,4,4,2,4,6,7,4,4,4,2,1,4,9,8,8,9,3,3,2,2,1};
        Arrays.sort(arr);
        System.out.println(Arrays.toString(arr));
        for(int i=0; i<arr.length-1 ; i++)
            if((float)arr[i]/(float)arr[i+1]!=1.0)
                System.out.print(arr[i] + " ");

    }
}

```

```
}
```

```
Given Array : [1, 2, 4, 4, 4, 4, 4, 5, 5, 5, 6, 6, 7, 7]
new Array : 1 2 4 5 6
```

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

```
package org.example;
```

```
import java.util.ArrayList;
```

```
import java.util.Arrays;
```

```
public class Que5 {
```

```
    public static void main(String[] args) {
        // TODO Auto-generated method stub
```

```
        int[] arr1 = {1,2,3,4,5,6,7,8,9,10,45,3,6,6,6,2,6,3,5,8,9,2,1,3,6,8,94,2,25,7,53,5,6,4,4,5,6,7,4,45,7,8,5,4,7,5,4,4,7,746,6,6};
        int[] arr2 = {1,3,5,7,9,10};
```

```
        Arrays.sort(arr1);
        Arrays.sort(arr2);
```

```
        int[] temparr = new int[arr1.length];
        int count = 0;
```

```
        for(int i=0 ; i<arr1.length-1 ; i++)
            for(int j=0 ; j<arr2.length ; j++)
                if((float)arr1[i]/(float)arr2[j] == 1.0) {
                    temparr[count] = arr1[i];
                    count++;
                }
        }
```

```
        int[] arr3 = new int[count];
        for(int i=0 ; i<count ; i++)
            arr3[i] = temparr[i];
```

```
        for(int i =0 ; i<arr3.length-1 ; i++)
            if((float)arr3[i]/(float)arr3[i+1] != 1.0) {
                System.out.println(arr3[i]);
            }
        }
```

```
    }
```

```
}
```

```
1 3 5 7 9
```

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

```
package org.example;

public class Que6 {
    public static void main(String[] args) {
        int[] array = {1, 2, 3, 4, 5, 6, 8, 9};
        int n = array.length + 1;

        int expectedSum = n * (n + 1) / 2;
        int actualSum = 0;
        for (int num : array) {
            actualSum += num;
        }

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

```
The missing number is: 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.

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

public class Que7 {
    private int[] numbers;

    public Que7(int size) {
        numbers = new int[size];
    }

    public void acceptRecord() {
        Scanner scanner = new Scanner(System.in);
        for (int i = 0; i < numbers.length; i++) {
            numbers[i] = scanner.nextInt();
        }
    }

    public void printRecord() {
        for (int num : numbers) {
            System.out.print(num + " ");
        }
        System.out.println();
    }

    public static void main(String[] args) {
        Que7 example = new Que7(5);
        example.acceptRecord();
        example.printRecord();
    }
}
```

```
}  
}
```

//Modify the previous assignment to use getter and setter methods instead of acceptRecord and printRecord

```
package org.example;  
import java.util.Scanner;  
  
public class Que8 {  
    private int[] numbers;  
  
    public Que8(int size) {  
        numbers = new int[size];  
    }  
  
    public void setNumbers(int[] numbers) {  
        this.numbers = numbers;  
    }  
  
    public int[] getNumbers() {  
        return numbers;  
    }  
  
    public static void main(String[] args) {  
        Que8 example = new Que8(5);  
        Scanner scanner = new Scanner(System.in);  
  
        int[] inputNumbers = new int[5];  
        System.out.println("Enter 5 numbers:");  
        for (int i = 0; i < inputNumbers.length; i++) {  
            inputNumbers[i] = scanner.nextInt();  
        }  
  
        example.setNumbers(inputNumbers);  
  
        int[] outputNumbers = example.getNumbers();  
        System.out.println("The numbers in the array are:");  
        for (int num : outputNumbers) {  
            System.out.print(num + " ");  
        }  
        System.out.println();  
    }  
}
```

```
Enter 5 numbers:
1
2
3
4
5
The numbers in the array are:
1 2 3 4 5
```

//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.

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

```
public class Que9 {
    private boolean[][] seats;

    public Que9(int rows, int columns) {
        seats = new boolean[rows][columns];
    }

    public void bookSeat(int row, int column) {
        if (row >= 0 && row < seats.length && column >= 0 && column < seats[0].length) {
            if (!seats[row][column]) {
                seats[row][column] = true;
                System.out.println("Seat booked successfully.");
            } else {
                System.out.println("Seat is already occupied.");
            }
        } else {
            System.out.println("Invalid seat number.");
        }
    }

    public void cancelBooking(int row, int column) {
        if (row >= 0 && row < seats.length && column >= 0 && column < seats[0].length) {
            if (seats[row][column]) {
                seats[row][column] = false;
                System.out.println("Booking cancelled successfully.");
            } else {
                System.out.println("Seat is already available.");
            }
        } else {
            System.out.println("Invalid seat number.");
        }
    }

    public boolean isSeatAvailable(int row, int column) {
```

```

        if (row >= 0 && row < seats.length && column >= 0 && column < seats[0].length) {
            return !seats[row][column];
        } else {
            System.out.println("Invalid seat number.");
            return false;
        }
    }
}

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

public static void main(String[] args) {
    Scanner scanner = new Scanner(System.in);
    System.out.println("Enter number of rows:");
    int rows = scanner.nextInt();
    System.out.println("Enter number of columns:");
    int columns = scanner.nextInt();

    Que9 airplane = new Que9(rows, columns);

    while (true) {
        System.out.println("1. Book a seat");
        System.out.println("2. Cancel a booking");
        System.out.println("3. Check seat availability");
        System.out.println("4. Display seating chart");
        System.out.println("5. Exit");
        System.out.print("Choose an option: ");
        int choice = scanner.nextInt();

        if (choice == 5) {
            break;
        }

        System.out.println("Enter row number:");
        int row = scanner.nextInt();
        System.out.println("Enter column number:");
        int column = scanner.nextInt();

        switch (choice) {
            case 1:
                airplane.bookSeat(row, column);
                break;
            case 2:
                airplane.cancelBooking(row, column);
                break;
            case 3:
                boolean available = airplane.isSeatAvailable(row, column);
                System.out.println("Seat availability: " + (available ? "Available" : "Occupied"));
                break;
            case 4:

```



```
        airplane.displaySeatingChart();
        break;
    default:
        System.out.println("Invalid option.");
    }
}
}
```

```
Enter number of rows:
2
Enter number of columns:
4
1. Book a seat
2. Cancel a booking
3. Check seat availability
4. Display seating chart
5. Exit
Choose an option: 4
Enter row number:
1
Enter column number:
2
Seating Chart:
0 0 0 0
0 0 0 0
1. Book a seat
2. Cancel a booking
3. Check seat availability
4. Display seating chart
5. Exit
Choose an option:
```