

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.Assignment6;
import java.util.Scanner;
public class Oned {
    public static void main(String[] args) {

        int[] arr = new int[5];

        System.out.println("Default values of the array:");
        for (int i = 0; i < arr.length; i++) {
            System.out.println("Element " + (i + 1) + ": " + arr[i]);
        }

        Scanner sc = new Scanner(System.in);
        System.out.println("Enter 5 integers:");
        for (int i = 0; i < arr.length; i++) {
            System.out.print("Enter element " + (i + 1) + ": ");
            arr[i] = sc.nextInt();
        }

        System.out.println("Updated values of the array:");
        for (int i = 0; i < arr.length; i++) {
            System.out.println("Element " + (i + 1) + ": " + arr[i]);
        }

        sc.close();
    }
}
```

```
1 package org.Assignment6;
2 import java.util.Scanner;
3
4 public class Oned {
5     public static void main(String[] args) {
6
7         int[] arr = new int[5];
8
9         System.out.println("Default values of the array:");
10        for (int i = 0; i < arr.length; i++) {
11            System.out.println("Element " + (i + 1) + ": " + arr[i]);
12        }
13
14        Scanner sc = new Scanner(System.in);
15        System.out.println("\nEnter 5 integers:");
16        for (int i = 0; i < arr.length; i++) {
17            System.out.print("Enter element " + (i + 1) + ": ");
18            arr[i] = sc.nextInt();
19        }
20
21        System.out.println("\nUpdated values of the array:");
22        for (int i = 0; i < arr.length; i++) {
23            System.out.println("Element " + (i + 1) + ": " + arr[i]);
24        }
25
26        sc.close();
27    }
28 }
29
30
```

```
-terminated- Oned [Java Application] C:\Users\Shreyas\p2\pool\plugins\org.eclipse.just4cpide
Default values of the array:
Element 1: 0
Element 2: 0
Element 3: 0
Element 4: 0
Element 5: 0

Enter 5 integers:
Enter element 1: 1
Enter element 2: 5
Enter element 3: 7
Enter element 4: 8
Enter element 5: 9

Updated values of the array:
Element 1: 1
Element 2: 5
Element 3: 7
Element 4: 8
Element 5: 9
```

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.Assignment6;
import java.util.Scanner;
class Mainmethod {
```

```
    public static void acceptRecord(int[] arr) {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter 5 Numbers: ");
        for(int i = 0; i < arr.length; i++) {
            System.out.println("Enter Number " + (i + 1) + ":");
            arr[i] = sc.nextInt();
        }
    }
    public static void printRecord(int[] arr) {
        Scanner sc = new Scanner(System.in);
        System.out.println("The Numbers in the Array are: ");
        for(int i = 0; i < arr.length; i++) {
            System.out.println("Number" + (i + 1) + ":" + arr[i]);
        }
    }
    public static void main(String[] args) {
        int[] arr = new int[5];
        acceptRecord(arr);
        printRecord(arr);
    }
}
```



The screenshot displays the Eclipse IDE with a Java project. The left pane shows the source code for `org.Assignment6.Mainmethod`. The code defines a `Scanner` object `sc` and two static methods: `acceptRecord` and `printRecord`. The `main` method initializes an integer array `arr` of size 5, calls `acceptRecord`, and then `printRecord`. The right pane shows the console output, which matches the expected behavior: it prompts for 5 numbers (4, 10, 8, 2, 5) and then prints them with their indices (Number1:4, Number2:10, etc.).

```
1 package org.Assignment6;
2 import java.util.Scanner;
3
4 class Mainmethod {
5
6
7
8     public static void acceptRecord(int[] arr) {
9         Scanner sc = new Scanner(System.in);
10        System.out.println("Enter 5 Numbers: ");
11        for(int i = 0; i < arr.length; i++) {
12            System.out.println("Enter Number " + (i + 1) + ":");
13            arr[i] = sc.nextInt();
14        }
15    }
16
17    public static void printRecord(int[] arr) {
18        Scanner sc = new Scanner(System.in);
19        System.out.println("The Numbers in the Array are: ");
20        for(int i = 0; i < arr.length; i++) {
21            System.out.println("Number" + (i + 1) + ":" + arr[i]);
22        }
23    }
24
25    public static void main(String[] args) {
26        int[] arr = new int[5];
27        acceptRecord(arr);
28        printRecord(arr);
29    }
30
31 }
32
33
34
35
36
```

```
<terminated> Mainmethod [Java Application] C:\Users\Shreya\p2\pool\plugins\org.eclipse
Enter 5 Numbers:
Enter Number 1:
4
Enter Number 2:
10
Enter Number 3:
8
Enter Number 4:
2
Enter Number 5:
5
The Numbers in the Array are:
Number1:4
Number2:10
Number3:8
Number4:2
Number5:5
```

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

```

package org.Assignment6;
import java.util.Scanner;
public class Minmax {
    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;
    }

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

        int[] arr = new int[5];
        System.out.println("Enter 5 numbers: ");
        for (int i = 0; i < arr.length; i++) {
            System.out.println("Enter Number " + (i + 1) + " : ");
            arr[i] = sc.nextInt();

            int max = findMax(arr);
            int min = findMin(arr);
            System.out.println("Maximum Value in the array: " + max);
            System.out.println("Minimum Value in the array: " + min);
        }
    }
}

```

ASSIGNMENT NO.6

```

9      for(int i = 1; i < arr.length; i++) {
10         if (arr[i] > max) {
11             max = arr[i];
12         }
13     }
14     return max;
15 }
16
17 public static int findMin(int[] arr) {
18     int min = arr[0];
19     for(int i = 1; i < arr.length; i++) {
20         if (arr[i] < min) {
21             min = arr[i];
22         }
23     }
24     return min;
25 }
26
27
28
29
30 public static void main(String[] args) {
31     Scanner sc = new Scanner(System.in);
32
33     int[] arr = new int[5];
34
35     System.out.println("Enter 5 numbers: ");
36     for (int i = 0; i < arr.length; i++) {
37         System.out.println("Enter Number " + (i + 1) + " : ");
38         arr[i] = sc.nextInt();
39     }
40
41     int max = findMax(arr);
42     int min = findMin(arr);
43     System.out.println("Maximum Value in the array: " + max);
44     System.out.println("Minimum Value in the array: " + min);
45 }

```

Output:

```

Enter 5 numbers:
Enter Number 1 : 5
Enter Number 2 : 9
Enter Number 3 : 10
Enter Number 4 : 50
Enter Number 5 : 100
Maximum Value in the array: 100
Minimum Value in the array: 5

```

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

```
package org.Assignment6;
```

```
import java.util.Scanner;
```

```
public class Duplicates {
```

```
    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();
```

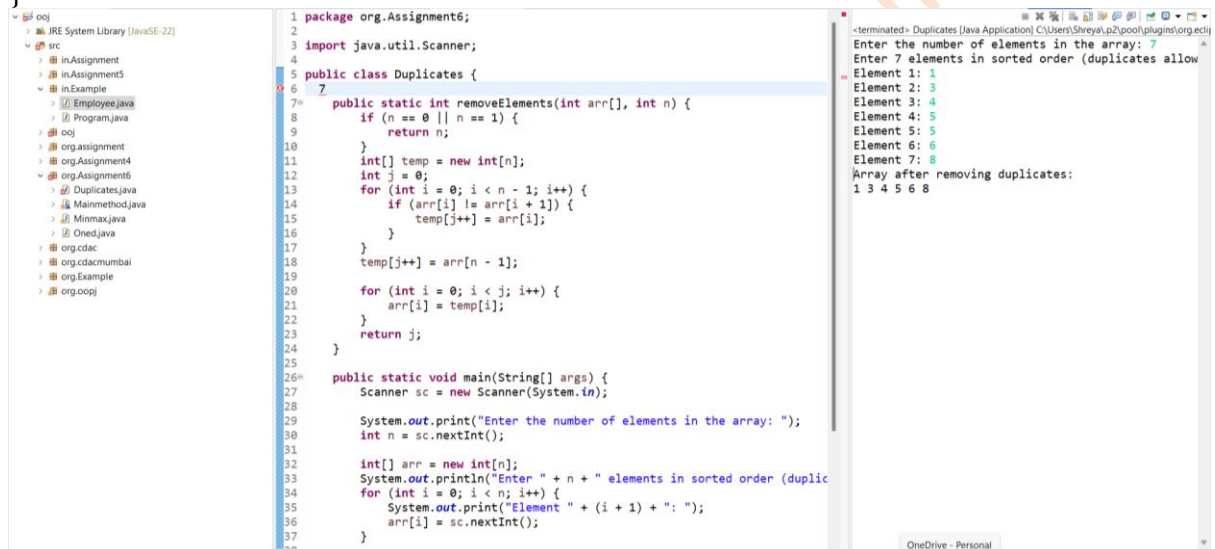
```

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] + " ");
}
}
}

```



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

```

package org.Assignment6;
import java.util.Scanner;
public class Intersection {

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

        System.out.print("Number of elements in first array: ");
        int n1 = sc.nextInt();
        int[] arr1 = new int[n1];
        System.out.println("Enter elements: ");
        for (int i = 0; i < n1; i++) {
            arr1[i] = sc.nextInt();
        }
    }
}

```

```

System.out.print("Number of elements in second array: ");
int n2 = sc.nextInt();
int[] arr2 = new int[n2];
System.out.println("Enter elements: ");
for (int i = 0; i < n2; i++) {
    arr2[i] = sc.nextInt();
}

```

```

System.out.println("Intersection of the two arrays: ");
for (int i = 0; i < n1; i++) {
    for (int j = 0; j < n2; j++) {
        if (arr1[i] == arr2[j]) {
            System.out.print(arr1[i] + " ");
            break;
        }
    }
}

```

The screenshot shows the Eclipse IDE with the following components:

- Project Explorer:** Shows the project structure with files like Employee.java, Program.java, Duplicates.java, Intersection.java, Mainmethod.java, Minmax.java, Oned.java, org.cole, org.cdacmumbai, org.Example, and org.oopj.
- Editor:** Displays the code for the 'Intersection' class. The code is as follows:


```

import java.util.Scanner;

public class Intersection {

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

        System.out.print("Number of elements in first array: ");
        int n1 = sc.nextInt();
        int[] arr1 = new int[n1];
        System.out.println("Enter elements: ");
        for (int i = 0; i < n1; i++) {
            arr1[i] = sc.nextInt();
        }

        System.out.print("Number of elements in second array: ");
        int n2 = sc.nextInt();
        int[] arr2 = new int[n2];
        System.out.println("Enter elements: ");
        for (int i = 0; i < n2; i++) {
            arr2[i] = sc.nextInt();
        }

        System.out.println("Intersection of the two arrays: ");
        for (int i = 0; i < n1; i++) {
            for (int j = 0; j < n2; j++) {
                if (arr1[i] == arr2[j]) {
                    System.out.print(arr1[i] + " ");
                    break;
                }
            }
        }
    }
}

```
- Output Console:** Shows the program execution with the following output:


```

Number of elements in first array: 5
Enter elements:
2
3
5
6
7
Number of elements in second array: 5
Enter elements:
4
5
6
7
Intersection of the two arrays:
5 6

```

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

```
package org.Assignment6;
import java.util.Scanner;
public class Missingnumber {

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

        System.out.print("Enter the value of n: ");
        int n = sc.nextInt();

        int[] arr = new int[n - 1];
        System.out.println("Enter " + (n - 1) + " elements between 1 and " + n + ":");
        for (int i = 0; i < n - 1; i++) {
            arr[i] = sc.nextInt();
        }

        int expectedSum = n * (n + 1) / 2;
        int actualSum = 0;
        for (int i = 0; i < n - 1; i++) {
            actualSum += arr[i];
        }

        int missingnumber = expectedSum - actualSum;

        System.out.println("The missing number is: " + missingnumber);
    }
}
```

The screenshot shows the Eclipse IDE with the following components:

- Project Explorer:** Shows the project structure with packages like org.Assignment6 and files like Missingnumber.java.
- Editor:** Displays the Java code for the Missingnumber class, which implements the logic to find the missing number in an array.
- Console:** Shows the output of the program execution, including the prompts for 'n' and the array elements, and the final result 'The missing number is: 2'.

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.Assignment6;
import java.util.Scanner;

class Assignment {
    private int[] arr;

    public Assignment(int size) {
        arr = new int[size];
    }

    public void acceptRecord() {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter " + arr.length + " numbers: ");
        for (int i = 0; i < arr.length; i++) {
            System.out.println("Number" + (i + 1) + " : ");
            arr[i] = sc.nextInt();
        }
    }

    public void printRecord() {
        System.out.println("The no. elements in the array are:");
        for (int i = 0; i < arr.length; i++) {
            System.out.println("Number" + (i + 1) + " : " + arr[i]);
        }
    }
}

class Program1 {
    public static void main(String[] args) {
        Assignment ass = new Assignment(5);
        ass.acceptRecord();
        ass.printRecord();
    }
}
```


ASSIGNMENT NO.6

```

1 package org.Assignment6;
2
3 import java.util.Scanner;
4
5 class Assignment {
6     private int[] arr;
7
8     public Assignment(int size) {
9         arr = new int[size];
10    }
11
12    public void acceptRecord() {
13        Scanner sc = new Scanner(System.in);
14        System.out.println("Enter " + arr.length + " numbers: ");
15        for (int i = 0; i < arr.length; i++) {
16            System.out.println("Number" + (i + 1) + " : ");
17            arr[i] = sc.nextInt();
18        }
19    }
20
21    public void printRecord() {
22        System.out.println("The no. elements in the array are:");
23        for (int i = 0; i < arr.length; i++) {
24            System.out.println("Number" + (i + 1) + " : " + arr[i]);
25        }
26    }
27 }
28
29 class Program1 {
30     public static void main(String[] args) {
31         Assignment ass = new Assignment(5);
32         ass.acceptRecord();
33         ass.printRecord();
34     }
35 }

```

```

-terminated- Program1 [Java Application] C:\Users\Shreyas\p2\poo\plugins\org.eclipse.just...
Enter 5 numbers:
Number1 :
5
Number2 :
6
Number3 :
7
Number4 :
8
Number5 :
8
The no. elements in the array are:
Number1 : 5
Number2 : 6
Number3 : 7
Number4 : 8
Number5 : 8

```

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

```

package org.Assignment6;
class Aeroplane1 {
    private boolean[][] seats;
    private int rows;
    private int cols;

    public Aeroplane1(int rows, int cols) {
        this.rows = rows;
        this.cols = cols;
        seats = new boolean[rows][cols];
    }

    public boolean bookSeat(int row, int col) {
        if (isValidSeat(row, col)) {
            if (!seats[row - 1][col - 1]) { // if the seat is available
                seats[row - 1][col - 1] = true; // book the seat
                System.out.println("Seat " + row + "-" + col + " successfully booked.");
                return true;
            } else {
                System.out.println("Seat " + row + "-" + col + " is already occupied.");
                return false;
            }
        }
    }

```

```

    }
}
return false;
}

// Method to cancel a seat booking
public boolean cancelSeat(int row, int col) {
    if (isValidSeat(row, col)) {
        if (seats[row - 1][col - 1]) { // if the seat is booked
            seats[row - 1][col - 1] = false; // cancel the booking
            System.out.println("Seat " + row + "-" + col + " booking canceled.");
            return true;
        } else {
            System.out.println("Seat " + row + "-" + col + " is already available.");
            return false;
        }
    }
    return false;
}

// Method to check if a seat is available
public boolean checkSeatAvailability(int row, int col) {
    if (isValidSeat(row, col)) {
        if (!seats[row - 1][col - 1]) {
            System.out.println("Seat " + row + "-" + col + " is available.");
            return true;
        } else {
            System.out.println("Seat " + row + "-" + col + " is occupied.");
            return false;
        }
    }
    return false;
}

// Method to display the seating chart
public void displaySeatingChart() {
    System.out.println("Current Seating Chart:");
    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < cols; j++) {
            if (seats[i][j]) {
                System.out.print(" X "); // X indicates occupied seat
            } else {
                System.out.print(" O "); // O indicates available seat
            }
        }
        System.out.println();
    }
}

```

```

    }

    // Helper method to validate if a seat exists
    private boolean isValidSeat(int row, int col) {
        if (row < 1 || row > rows || col < 1 || col > cols) {
            System.out.println("Invalid seat number. Please try again.");
            return false;
        }
        return true;
    }
}

package org.Assignment6;
import java.util.Scanner;
public class Aeroplane {

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

        System.out.print("Enter the number of rows in the airplane: ");
        int rows = sc.nextInt();

        System.out.print("Enter the number of columns in the airplane: ");
        int cols = sc.nextInt();

        // Initialize airplane seating
        Aeroplane1 seating = new Aeroplane1(rows, cols);

        int choice;
        do {
            System.out.println("\nMenu:");
            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("Enter your choice: ");
            choice = sc.nextInt();

            switch (choice) {
                case 1:
                    // Book a seat
                    System.out.print("Enter row number to book: ");
                    int rowToBook = sc.nextInt();
                    System.out.print("Enter column number to book: ");
                    int colToBook = sc.nextInt();
                    seating.bookSeat(rowToBook, colToBook);
                    break;
            }
        } while (choice != 5);
    }
}

```

```

case 2:
    // Cancel a booking
    System.out.print("Enter row number to cancel: ");
    int rowToCancel = sc.nextInt();
    System.out.print("Enter column number to cancel: ");
    int colToCancel = sc.nextInt();
    seating.cancelSeat(rowToCancel, colToCancel);
    break;
case 3:
    // Check seat availability
    System.out.print("Enter row number to check: ");
    int rowToCheck = sc.nextInt();
    System.out.print("Enter column number to check: ");
    int colToCheck = sc.nextInt();
    seating.checkSeatAvailability(rowToCheck, colToCheck);
    break;
case 4:
    // Display seating chart
    seating.displaySeatingChart();
    break;
case 5:
    // Exit
    System.out.println("Exiting the system...");
    break;
default:
    System.out.println("Invalid choice. Please try again.");
}
} while (choice != 5);

sc.close();
}
}

```

```

package org.example;

import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        Seating seating = new Seating(10, 20);

        int choice;
        do {
            System.out.println("Menu:");
            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("Enter your choice: ");
            choice = sc.nextInt();

            switch (choice) {
                case 1:
                    // Book a seat
                    System.out.print("Enter row number to book: ");
                    int rowToBook = sc.nextInt();
                    System.out.print("Enter column number to book: ");
                    int colToBook = sc.nextInt();
                    seating.bookSeat(rowToBook, colToBook);
                    break;
                case 2:
                    // Cancel a booking
                    System.out.print("Enter row number to cancel: ");
                    int rowToCancel = sc.nextInt();
                    System.out.print("Enter column number to cancel: ");
                    int colToCancel = sc.nextInt();
                    seating.cancelSeat(rowToCancel, colToCancel);
                    break;
                case 3:
                    // Check seat availability
                    System.out.print("Enter row number to check: ");
                    int rowToCheck = sc.nextInt();
                    System.out.print("Enter column number to check: ");
                    int colToCheck = sc.nextInt();
                    seating.checkSeatAvailability(rowToCheck, colToCheck);
                    break;
                case 4:
                    // Display seating chart
                    seating.displaySeatingChart();
                    break;
                case 5:
                    // Exit
                    System.out.println("Exiting the system...");
                    break;
                default:
                    System.out.println("Invalid choice. Please try again.");
            }
        } while (choice != 5);

        sc.close();
    }
}

```

Output:

```

Menu:
1. Book a seat
2. Cancel a booking
3. Check seat availability
4. Display seating chart
5. Exit
Enter your choice: 1
Enter row number to book: 8
Enter column number to book: 5
Seat 8-5 successfully booked.

Menu:
1. Book a seat
2. Cancel a booking
3. Check seat availability
4. Display seating chart
5. Exit
Enter your choice: 3
Enter row number to check: 5
Enter column number to check: 3
Seat 5-3 is available.

Menu:
1. Book a seat
2. Cancel a booking
3. Check seat availability
4. Display seating chart
5. Exit
Enter your choice: 4
Current Seating Chart:
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

```

sandeepkulange@gmail.com