

Assignment No:-19

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Batch: - Delta - DCA (Java) 2024 Date:-29/5/2024

Q4. You are given two arrays, A and B, of equal size N. The task is to find the minimum value of $A[0] * B[0] + A[1] * B[1] + \dots + A[N-1] * B[N-1]$, where shuffling of elements of arrays A and B is allowed.

Example 1:

Input: N = 3

A[] = {3, 1, 1}

B[] = {6, 5, 4}

Output: 23.

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.22000.2538]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Shree\Desktop\Assingment_Java_Codenera>javac FindTheMinimumValueOfSeriesOfArray.java
C:\Users\Shree\Desktop\Assingment_Java_Codenera>java FindTheMinimumValueOfSeriesOfArray
Enter array size :3
-----
Enter array element :3 1 1
-----
Enter 2 array element :6 5 4
-----
Minimum value is: 23
C:\Users\Shree\Desktop\Assingment_Java_Codenera>
```

```
import java.util.*;
public class FindTheMinimumValueOfSeriesOfArray
{
    public static void main(String[]ar)
    {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter array size :");
        int size = sc.nextInt();
        System.out.println("\n-----");
        int a[]=new int[size];
        int b[]=new int[size];
        System.out.print("Enter array element :");
        for(int i=0;i<a.length;i++)
        {
            a[i]=sc.nextInt();
        }
        System.out.println("\n-----");
        System.out.print("Enter 2 array element :");
        for(int i=0;i<b.length;i++)
        {
            b[i]=sc.nextInt();
        }
        System.out.println("\n-----");
        int sum=0;
        for(int i=0;i<b.length;i++)
        {
            for(int j=i+1;j<b.length;j++)
            {
                if(b[i]>b[j])
                {
                    int t=b[i];
                    b[i]=b[j];
                    b[j]=t;
                }
            }
        }
    }
}
```

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.22000.2538]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Shree\Desktop\Assignment_Java_Codenera>javac FindTheMinimumValueOfSeriesOfArray.java
C:\Users\Shree\Desktop\Assignment_Java_Codenera>java FindTheMinimumValueOfSeriesOfArray
Enter array size :3
-----
Enter array element :3 1 1
-----
Enter 2 array element :6 5 4
-----
Minimum value is: 23
C:\Users\Shree\Desktop\Assignment_Java_Codenera>
```

```
GuessTheNumber  Array Assignment 5.0  FindTheMinimumValue
File Edit View

int b[]=new int[size];
System.out.print("Enter array element :");
for(int i=0;i<a.length;i++)
{
    a[i]=sc.nextInt();
}
System.out.println("\n-----");
System.out.print("Enter 2 array element :");
for(int i=0;i<b.length;i++)
{
    b[i]=sc.nextInt();
}
System.out.println("\n-----");
int sum=0;
for(int i=0;i<b.length;i++)
{
    for(int j=i+1;j<b.length;j++)
    {
        if(b[i]>b[j])
        {
            int t=b[i];
            b[i]=b[j];
            b[j]=t;
        }
    }
}
for(int i=0;i<a.length;i++)
{
    int temp=a[i]*b[i];
    sum+=temp;
}
System.out.print("Minimum value is: "+sum);
}
```

Q5. Given two sorted arrays arr1 and arr2 of size N and M respectively and an element K. The task is to find the element that would be at the k'th position of the final sorted array.

Example 1:

Input: arr1[] = {2, 3, 6, 7, 9}

arr2[] = {1, 4, 8, 10}

k = 5

Output: 6

```
C:\Windows\System32\cmd.exe
C:\Users\Shree\Desktop\Assingment_Java_Codenera>javac FindTheKthEleFromFinalSortedArray.java
C:\Users\Shree\Desktop\Assingment_Java_Codenera>java FindTheKthEleFromFinalSortedArray
Enter 1 array size :5
-----
Enter 2 array size :4
-----
Enter 1 array element :2 3 6 7 9
-----
Enter 2 array element :1 4 8 10
-----
Enter k position :5
-----
Kth position array element is :6
C:\Users\Shree\Desktop\Assingment_Java_Codenera>
```

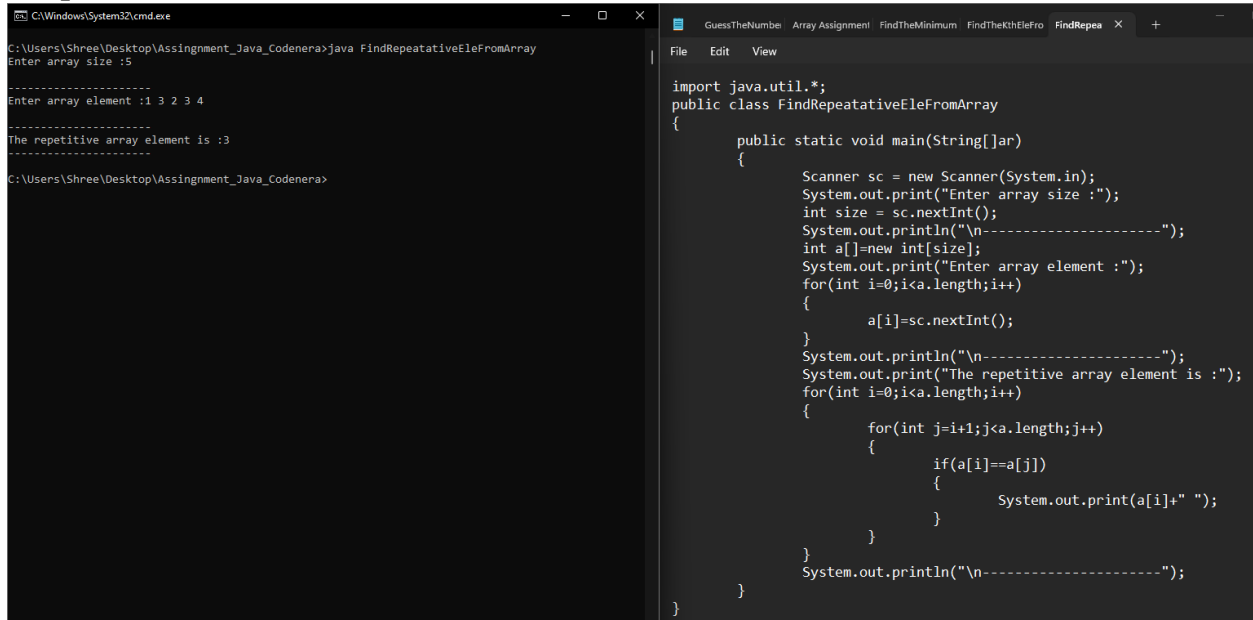
```
import java.util.*;
public class FindTheKthEleFromFinalSortedArray
{
    public static void main(String[] ar)
    {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter 1 array size :");
        int size = sc.nextInt();
        System.out.println("\n-----");
        System.out.print("Enter 2 array size :");
        int size1 = sc.nextInt();
        System.out.println("\n-----");
        int a[]=new int[size];
        int b[]=new int[size1];
        int c[]=new int[a.length+b.length];
        System.out.print("Enter 1 array element :");
        for(int i=0;i<a.length;i++)
        {
            a[i]=sc.nextInt();
        }
        System.out.println("\n-----");
        System.out.print("Enter 2 array element :");
        for(int i=0;i<b.length;i++)
        {
            b[i]=sc.nextInt();
        }
        System.out.println("\n-----");
        System.out.print("Enter k position :");
        int k = sc.nextInt();
        System.out.println("\n-----");
        int c1=0;
        for(int i=0;i<a.length;i++)
        {
            System.out.println("\n-----");
            int c1=0;
            for(int i=0;i<a.length;i++)
            {
                c[i]=a[i];
                c1++;
            }
            for(int j=0;j<b.length;j++)
            {
                c[c1]=b[j];
                c1++;
            }
            for(int i=0;i<c.length;i++)
            {
                for(int j=i+1;j<c.length;j++)
                {
                    if(c[i]>c[j])
                    {
                        int t=c[i];
                        c[i]=c[j];
                        c[j]=t;
                    }
                }
            }
            System.out.print("Kth position array element is :");
            for(int i=0;i<c.length;i++)
            {
                if((i+1)==k)
                System.out.print(c[i]+" ");
            }
            System.out.print("\n-----");
        }
    }
}
```

Q6. Given an array of size N filled with numbers from 1 to N-1 in random order. The array has only one repetitive element. The task is to find the repetitive element.

Examples:

Input: a[] = {1, 3, 2, 3, 4}

Output: 3



The image shows a screenshot of a Java IDE with two windows. The left window is a command prompt titled 'C:\Windows\System32\cmd.exe' showing the execution of a Java program. The right window is a code editor titled 'FindRepea' showing the source code of the program.

Command Prompt Output:

```
C:\Users\Shree\Desktop\Assingment_Java_Codenera>java FindRepeatativeEleFromArray
Enter array size :5
-----
Enter array element :1 3 2 3 4
-----
The repetitive array element is :3
-----
C:\Users\Shree\Desktop\Assingment_Java_Codenera>
```

Source Code:

```
import java.util.*;
public class FindRepeatativeEleFromArray
{
    public static void main(String[] ar)
    {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter array size :");
        int size = sc.nextInt();
        System.out.println("\n-----");
        int a[]=new int[size];
        System.out.print("Enter array element :");
        for(int i=0;i<a.length;i++)
        {
            a[i]=sc.nextInt();
        }
        System.out.println("\n-----");
        System.out.print("The repetitive array element is :");
        for(int i=0;i<a.length;i++)
        {
            for(int j=i+1;j<a.length;j++)
            {
                if(a[i]==a[j])
                {
                    System.out.print(a[i]+" ");
                }
            }
        }
        System.out.println("\n-----");
    }
}
```

Q7. Given two unsorted arrays that represent two sets (elements in every array are distinct), find the union and intersection of two arrays.

Example: arr1[] = {7, 1, 5, 2, 3, 6} arr2[] = {3, 8, 6, 20, 7}

Then your program should print Union as {1, 2, 3, 5, 6, 7, 8, 20} and Intersection as {3, 6, 7}. Note that the elements of union and intersection can be printed in any order.

```
C:\Users\Shree\Desktop\Assingnment_Java_Codenera>javac UnionAndIntersectionOfArrayEle.java
C:\Users\Shree\Desktop\Assingnment_Java_Codenera>java UnionAndIntersectionOfArrayEle
Enter 1 array size :6
-----
Enter 2 array size :5
-----
Enter 1 array element :7 1 5 2 3 6
-----
Enter 2 array element :3 8 6 20 7
-----
Intersection of two arrays :3 6 7
Union of two arrays :1 2 3 5 6 7 8 20
-----
C:\Users\Shree\Desktop\Assingnment_Java_Codenera>
```

```
import java.util.*;
public class UnionAndIntersectionOfArrayEle
{
    public static void main(String[]ar)
    {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter 1 array size :");
        int size = sc.nextInt();
        System.out.println("\n-----");
        System.out.print("Enter 2 array size :");
        int size1 = sc.nextInt();
        System.out.println("\n-----");
        int a[]=new int[size];
        int b[]=new int[size1];
        int c[]=new int[a.length+b.length];
        System.out.print("Enter 1 array element :");
        for(int i=0;i<a.length;i++)
        {
            a[i]=sc.nextInt();
        }
        System.out.println("\n-----");
        System.out.print("Enter 2 array element :");
        for(int i=0;i<b.length;i++)
        {
            b[i]=sc.nextInt();
        }
        System.out.println("\n-----");
        int c1=0;
        for(int i=0;i<a.length;i++)
        {
            c[i]=a[i];
            c1++;
        }
        for(int j=0;j<b.length;j++)
        {
            c[c1]=b[j];
            c1++;
        }
        for(int i=0;i<c.length;i++)
        {
            for(int j=i+1;j<c.length;j++)
            {
                if(c[i]>c[j])
                {
                    int t=c[i];
                    c[i]=c[j];
                    c[j]=t;
                }
            }
        }
        System.out.println("\n-----");
        System.out.print("Intersection of two arrays :");
        for(int i=0;i<c.length;i++)
        {
            for(int j=i+1;j<c.length;j++)
            {
                if(c[i]==c[j])
                {
                    if(c[i]!=-1)
                        System.out.print(c[i]+" ");
                }
                if(c[i]==c[j])
                {
                    c[j]=-1;
                }
            }
        }
    }
}
```

```
C:\Windows\System32\cmd.exe
C:\Users\Shree\Desktop\Assingment_Java_Codenera>javac UnionAndIntersectionOfArrayEle.java
C:\Users\Shree\Desktop\Assingment_Java_Codenera>java UnionAndIntersectionOfArrayEle
Enter 1 array size :6
-----
Enter 2 array size :5
-----
Enter 1 array element :7 1 5 2 3 6
-----
Enter 2 array element :3 8 6 20 7
-----
Intersection of two arrays :3 6 7
-----
Union of two arrays :1 2 3 5 6 7 8 20
-----
C:\Users\Shree\Desktop\Assingment_Java_Codenera>

}

c[i]=c[j];
c[j]=t;
    }
}
System.out.println("\n-----");
System.out.print("Intersection of two arrays :");
for(int i=0;i<c.length;i++)
{
    for(int j=i+1;j<c.length;j++)
    {
        if(c[i]==c[j])
        {
            if(c[i]!=-1)
                System.out.print(c[i]+" ");
            if(c[i]==c[j])
            {
                c[j]=-1;
            }
        }
    }
}
System.out.println("\n-----");
System.out.print("Union of two arrays :");
for(int i=0;i<c.length;i++)
{
    if(c[i]!=-1)
        System.out.print(c[i]+" ");
}
System.out.println("\n-----");
}
```

Q8. Given three arrays sorted in non-decreasing order, print all common elements in these arrays.

Examples:

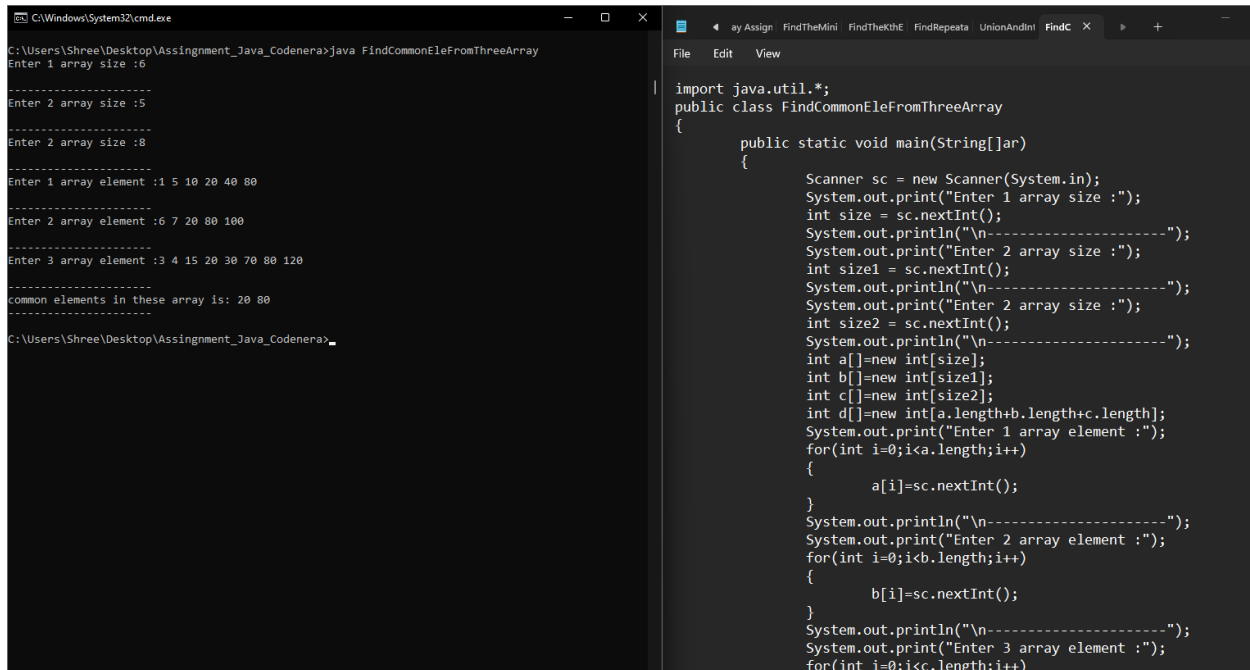
Input:

ar1[] = {1, 5, 10, 20, 40, 80}

ar2[] = {6, 7, 20, 80, 100}

ar3[] = {3, 4, 15, 20, 30, 70, 80, 120}

Output: 20, 80



The image shows a screenshot of a Java program and its execution. On the left, a Windows command prompt window displays the execution of the program. The user enters the command to run the program, followed by prompts for three array sizes and their elements. The program outputs the common elements, 20 and 80. On the right, an IDE window shows the source code of the program, which uses a Scanner to read input and prints the common elements.

```
C:\Windows\System32\cmd.exe
C:\Users\Shree\Desktop\Assingment_Java_Codenera>java FindCommonEleFromThreeArray
Enter 1 array size :6
-----
Enter 2 array size :5
-----
Enter 2 array size :8
-----
Enter 1 array element :1 5 10 20 40 80
Enter 2 array element :6 7 20 80 100
-----
Enter 3 array element :3 4 15 20 30 70 80 120
-----
common elements in these array is: 20 80
-----
C:\Users\Shree\Desktop\Assingment_Java_Codenera>
```

```
import java.util.*;
public class FindCommonEleFromThreeArray
{
    public static void main(String[]ar)
    {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter 1 array size :");
        int size = sc.nextInt();
        System.out.println("\n-----");
        System.out.print("Enter 2 array size :");
        int size1 = sc.nextInt();
        System.out.println("\n-----");
        System.out.print("Enter 2 array size :");
        int size2 = sc.nextInt();
        System.out.println("\n-----");
        int a[]=new int[size];
        int b[]=new int[size1];
        int c[]=new int[size2];
        int d[]=new int[a.length+b.length+c.length];
        System.out.print("Enter 1 array element :");
        for(int i=0;i<a.length;i++)
        {
            a[i]=sc.nextInt();
        }
        System.out.println("\n-----");
        System.out.print("Enter 2 array element :");
        for(int i=0;i<b.length;i++)
        {
            b[i]=sc.nextInt();
        }
        System.out.println("\n-----");
        System.out.print("Enter 3 array element :");
        for(int i=0;i<c.length;i++)
```

```
C:\Windows\System32\cmd.exe
C:\Users\Shree\Desktop\Assingment_Java_Codenera>java FindCommonEleFromThreeArray
Enter 1 array size :6
-----
Enter 2 array size :5
-----
Enter 2 array size :8
-----
Enter 1 array element :1 5 10 20 40 80
-----
Enter 2 array element :6 7 20 80 100
-----
Enter 3 array element :3 4 15 20 30 70 80 120
-----
common elements in these array is: 20 80
-----
C:\Users\Shree\Desktop\Assingment_Java_Codenera>
```

```
ay Assign FindTheMini FindTheKthE FindRepeata UnionAndInt FindC X
File Edit View
System.out.println("Enter 3 array element :");
for(int i=0;i<c.length;i++)
{
    c[i]=sc.nextInt();
}
int c1=0;
for(int i=0;i<a.length;i++)
{
    d[i]=a[i];
    c1++;
}
for(int i=0;i<b.length;i++)
{
    d[c1]=b[i];
    c1++;
}
for(int i=0;i<c.length;i++)
{
    d[c1]=c[i];
    c1++;
}
System.out.println("\n-----");
System.out.print("common elements in these array is: ");
for(int i=0;i<d.length;i++)
{
    for(int j=i+1;j<d.length;j++)
    {
        if(d[i]==d[j])
        {
            if(d[i]!=-1)
                System.out.print(d[i]+" ");
        }
        if(d[i]==d[j])
        {
            d[j]=-1;
            d[i]=-1;
        }
    }
}
System.out.println("\n-----");
}
```

```
C:\Windows\System32\cmd.exe
C:\Users\Shree\Desktop\Assingment_Java_Codenera>java FindCommonEleFromThreeArray
Enter 1 array size :6
-----
Enter 2 array size :5
-----
Enter 2 array size :8
-----
Enter 1 array element :1 5 10 20 40 80
-----
Enter 2 array element :6 7 20 80 100
-----
Enter 3 array element :3 4 15 20 30 70 80 120
-----
common elements in these array is: 20 80
-----
C:\Users\Shree\Desktop\Assingment_Java_Codenera>
```

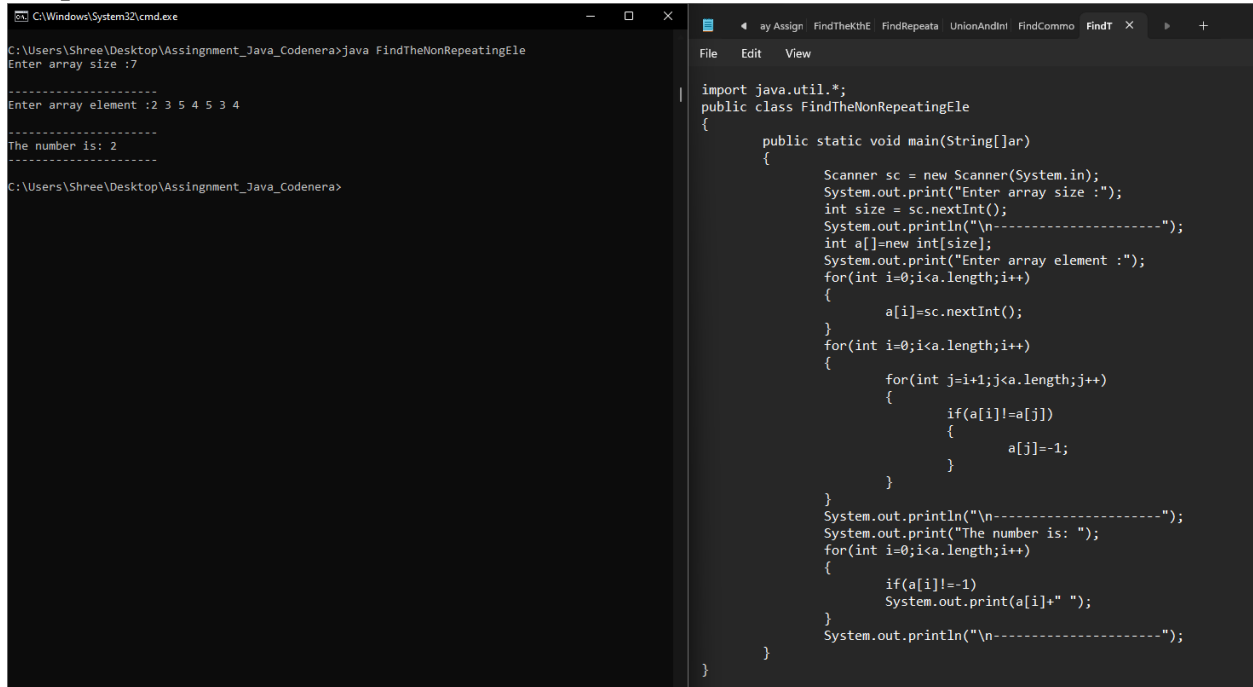
```
ay Assign FindTheMini FindTheKthE FindRepeata UnionAndInt FindC X
File Edit View
d[i]=a[i];
c1++;
}
for(int i=0;i<b.length;i++)
{
    d[c1]=b[i];
    c1++;
}
for(int i=0;i<c.length;i++)
{
    d[c1]=c[i];
    c1++;
}
System.out.println("\n-----");
System.out.print("common elements in these array is: ");
for(int i=0;i<d.length;i++)
{
    for(int j=i+1;j<d.length;j++)
    {
        if(d[i]==d[j])
        {
            if(d[i]!=-1)
                System.out.print(d[i]+" ");
        }
        if(d[i]==d[j])
        {
            d[j]=-1;
            d[i]=-1;
        }
    }
}
System.out.println("\n-----");
}
```


Q9. Given an array of integers. All numbers occur twice except one number which occurs once.

Example :

Input: arr[] = {2, 3, 5, 4, 5, 3, 4}

Output: 2



The image shows a screenshot of a Java IDE (IntelliJ IDEA) and a Windows Command Prompt. The Command Prompt on the left displays the execution of a Java program. The user enters the array size 7 and the array elements 2 3 5 4 5 3 4. The program outputs "The number is: 2". The IDE on the right shows the source code of the program, which uses a nested loop to find the non-repeating element by comparing each element with the others in the array.

```
C:\Windows\System32\cmd.exe
C:\Users\Shree\Desktop\Assignment_Java_Codenera>java FindTheNonRepeatingEle
Enter array size :7
Enter array element :2 3 5 4 5 3 4
The number is: 2
C:\Users\Shree\Desktop\Assignment_Java_Codenera>
```

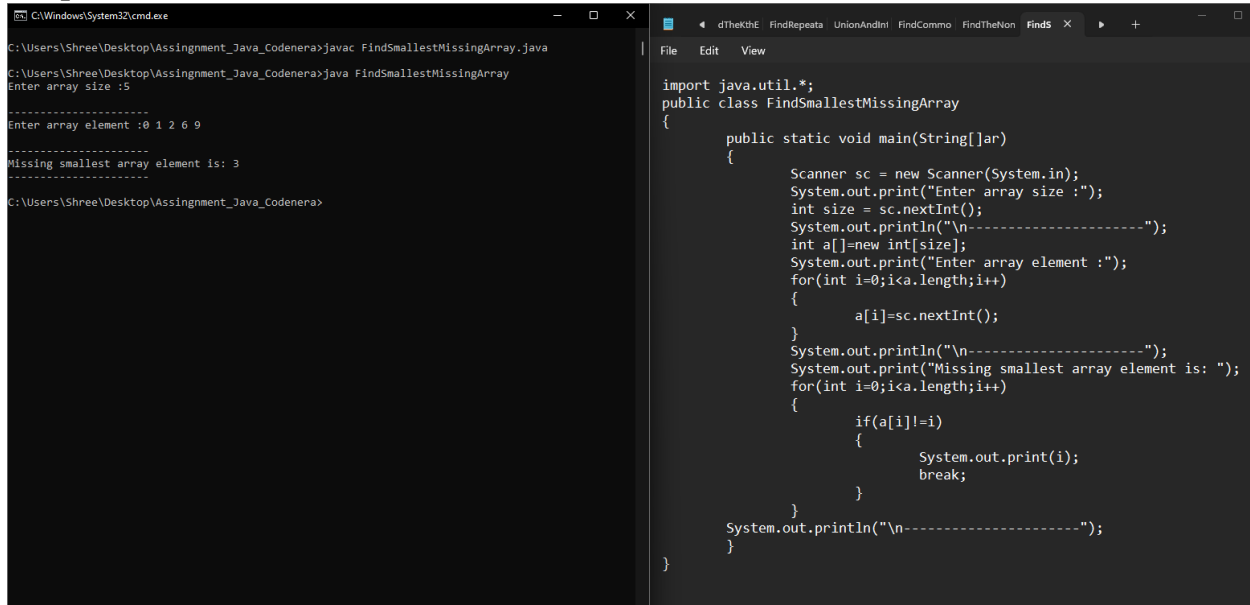
```
import java.util.*;
public class FindTheNonRepeatingEle
{
    public static void main(String[]ar)
    {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter array size :");
        int size = sc.nextInt();
        System.out.println("\n-----");
        int a[]=new int[size];
        System.out.print("Enter array element :");
        for(int i=0;i<a.length;i++)
        {
            a[i]=sc.nextInt();
        }
        for(int i=0;i<a.length;i++)
        {
            for(int j=i+1;j<a.length;j++)
            {
                if(a[i]!=a[j])
                {
                    a[j]=-1;
                }
            }
        }
        System.out.println("\n-----");
        System.out.print("The number is: ");
        for(int i=0;i<a.length;i++)
        {
            if(a[i]!=-1)
                System.out.print(a[i]+" ");
        }
        System.out.println("\n-----");
    }
}
```

Q11. Given a sorted array of n distinct integers where each integer is in the range from 0 to $m-1$ and $m > n$. Find the smallest number that is missing from the array.

Examples:

Input: {0, 1, 2, 6, 9}, $n = 5$, $m = 10$

Output: 3



The image shows a Java IDE with a file named 'FindSmallestMissingArray.java' open. The code implements a method to find the smallest missing number in a sorted array of distinct integers. The IDE also shows a command prompt window where the program was executed with the input array {0, 1, 2, 6, 9}, n=5, and m=10, resulting in the output 3.

```
import java.util.*;
public class FindSmallestMissingArray
{
    public static void main(String[] args)
    {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter array size :");
        int size = sc.nextInt();
        System.out.println("\n-----");
        int a[] = new int[size];
        System.out.print("Enter array element :");
        for(int i=0; i<a.length; i++)
        {
            a[i] = sc.nextInt();
        }
        System.out.println("\n-----");
        System.out.print("Missing smallest array element is: ");
        for(int i=0; i<a.length; i++)
        {
            if(a[i] != i)
            {
                System.out.print(i);
                break;
            }
        }
        System.out.println("\n-----");
    }
}
```

```
C:\Users\Shree\Desktop\Assignment_Java_Codenera>javac FindSmallestMissingArray.java
C:\Users\Shree\Desktop\Assignment_Java_Codenera>java FindSmallestMissingArray
Enter array size :5
-----
Enter array element :0 1 2 6 9
-----
Missing smallest array element is: 3
C:\Users\Shree\Desktop\Assignment_Java_Codenera>
```