

Programs

ARRAYS

1.Count the number of occurrences of each element in the array

```
package programs.array;

import java.util.HashSet;

public class CountOccOfElementInArray
{
    public static void main(String[] args)
    {
        int a[] = { 1, 9, 4, 5, 6, 7, 5, 6, 7, 3, 2, 5, 7, 9, 0, 4, 3, 5, 1, 4,
                    6, 0, 2, 3, 1, 4, 3, 8 };
        HashSet<Integer> al = new HashSet<Integer>();

        for (int i = 0; i < a.length; i++)
        {
            al.add(a[i]);
        }

        System.out.println("al " + al);

        for (int set : al)
        {
            int count = 0;
            for (int j = 0; j < a.length; j++)
            {
                if (set == a[j])
                {
                    count++;
                }
            }
            System.out.println(set + " occurs " + count + " times");
        }
    }
}
```

Output:

```
al [0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
0 occurs 2 times
1 occurs 3 times
2 occurs 2 times
3 occurs 4 times
4 occurs 4 times
5 occurs 4 times
6 occurs 3 times
7 occurs 3 times
8 occurs 1 times
9 occurs 2 times
```

2.Remove duplicates from array

```
package programs.array;

import java.util.Arrays;

public class RemoveDuplicatesFromArray
{
    public static int removeDuplicates(int array[], int n)
    {
        if (n == 0 || n == 1)
        {
            return n;
        }
        int j = 0; // for next element
        for (int i = 0; i < n - 1; i++)
        {
            if (array[i] != array[i + 1])
            {
                array[j++] = array[i];
            }
        }
        array[j++] = array[n - 1];
        return j;
    }

    public static void main(String[] args)
    {
        int array[] = { 18, 18, 25, 25, 25, 28, 28, 29, 30, 30, 25, 30 };
        Arrays.sort(array);
        int length = array.length;
        length = removeDuplicates(array, length);
        // printing array elements
        for (int i = 0; i < length; i++)
        {
            System.out.print(array[i] + " ");
        }
    }
}
```

Output:

18 25 28 29 30

3.Remove duplicates from array collections

```
package programs.array;

import java.util.HashSet;
import java.util.Set;

public class RemoveDuplicatesFromArrayCollection
{
    public static void main(String[] args)
    {
        int r[] = { 2, 2, 4, 5, 6, 7, 9, 7 };
        Set<Integer> setval = new HashSet<Integer>();
        for (int i = 0; i < r.length; ++i)
        {
            setval.add(r[i]);
        }
        System.out.println("Setval::" + setval);

        // For String
        String s[] = { "AA", "A", "A", "B","C","D","B" };
        Set<String> set = new HashSet<String>();
        for (int i = 0; i < s.length; ++i)
        {
            set.add(s[i]);
        }
        System.out.println("Set::" + set);
    }
}
```

Output:

Setval::[2, 4, 5, 6, 7, 9]

Set::[AA, A, B, C, D]

5.Reverse an array

```
package programs.array;

import java.util.Arrays;

public class ReverseAnArray
{
    public static void main(String[] args)
    {
        int[] a = { 10, 20, 30, 40, 50 };
        int length = a.length;

        for(int i = 0; i < length / 2; i++)
        {
            int temp = a[i];
            a[i] = a[length - i - 1];
            a[length - i - 1] = temp;
        }

        System.out.println(Arrays.toString(a));
    }
}
```

Output:

[50, 40, 30, 20, 10]

6.Sum of elements in an array

```
package programs.array;

public class SumOfElementsInAnArray
{
    public static void main(String[] args)
    {
        int add = 0;
        int[] a = { 10, 20, 30, 40, 50 };
        for (int i = 0; i < a.length; i++)
        {
            add += a[i];
        }
        System.out.println("Sum of elements in an array:." + add);
    }
}
```

Output:

Sum of elements in an array:150

NUMBERS

7.Binary search

```
package programs.numbers;

import java.util.Scanner;

public class BinarySearch
{
    public static void main(String[] args)
    {
        int num, a[] = null, i, key, pos;
        Scanner sc = new Scanner(System.in);
        num = sc.nextInt();

        System.out.println("Enter" + num + "elements");
        for (i = 0; i < num; i++)
        { a[i] = sc.nextInt();}

        System.out.println("Enter the element to be searched:");
        key = sc.nextInt();
        pos = binarySearch(key, a, num);

        if (pos == -1)
        {
            System.out.println("Element not found");
        } else
        {
            System.out.println("Element" + key + "found at position" + pos);
        }
    }

    private static int binarySearch(int key, int[] a, int num)
    {
        int low, high, mid;
        low = 0;
        high = num - 1;

        while (low <= high)
        {
            mid = (low + high) / 2;
            if (key == a[mid])
                high = mid - 1;
            if (key > a[mid])
                low = mid + 1;
        }
        return -1;
    }
}
```

Output:

8.Bubble sort

```
package programs.numbers;

import java.util.Arrays;

public class BubbleSort
{
    public static void main(String[] args)
    {
        int[] arr = new int[] { 6, 8, 7, 4, 312, 78, 54, 9, 12, 100, 89, 74 };

        for (int i = 0; i < arr.length; i++)
        {
            for (int j = i + 1; j < arr.length; j++)
            {
                int tmp = 0;
                if (arr[i] > arr[j])
                {
                    tmp = arr[i];
                    arr[i] = arr[j];
                    arr[j] = tmp;
                }
            }
        }
        System.out.println(Arrays.toString(arr));
    }
}
```

Output:

[4, 6, 7, 8, 9, 12, 54, 74, 78, 89, 100, 312]

9.Check Even or Odd

```
package programs.numbers;

import java.util.Scanner;

public class CheckEvenOdd
{
    public static void main(String args[])
    {
        int num;
        System.out.println("Enter an Integer number:");

        // The input provided by user is stored in num
        Scanner input = new Scanner(System.in);
        num = input.nextInt();

        /*
         * If number is divisible by 2 then it's an even number else odd number
         */
        if (num % 2 == 0)
            System.out.println("Entered number is even");
        else
            System.out.println("Entered number is odd");
    }
}
```

Output:

```
Enter an Integer number:
6
Entered number is even
```


9.Factorial

```
package programs.numbers;

import java.util.Scanner;

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

        System.out.println("Enter the number:");
        int num = sc.nextInt();

        int factorial = fact(num);
        System.out.println("Factorial of entered number is:" + factorial);
    }

    public static int fact(int n)
    {
        int result;
        if (n == 0)
        {
            return 1;
        }
        result = n * fact(n - 1);
        return result;
    }
}
```

Output:

```
Enter the number:
5
Factorial of entered number is:120
```

10.Fibonacci

```
package programs.numbers;

public class Fibonacci
{
    public static void main(String[] args)
    {
        int count = 7, num1 = 0, num2 = 1;

        System.out.print("Fibonacci Series of " + count + " numbers:");

        for (int i = 1; i <= count; ++i)
        {
            System.out.print(num1 + " ");

            int sumOfPrevTwo = num1 + num2;
            num1 = num2;
            num2 = sumOfPrevTwo;
        }
    }
}
```

Output:

Fibonacci Series of 7 numbers:0 1 1 2 3 5 8

11.Floyds Triangle

```
package programs.numbers;

import java.util.Scanner;

public class FloydsTriangle
{
    public static void main(String[] args)
    {
        int rows, number = 1, counter, j;

        Scanner sc = new Scanner(System.in);

        System.out.println("Enter the number of rows for floyd's triangle:");
        rows = sc.nextInt();
        System.out.println("Floyd's triangle");
        System.out.println("*****");

        for (counter = 1; counter <= rows; counter++)
        {
            for (j = 1; j <= counter; j++)
            {
                System.out.print(number + " ");
                number++;
            }
            System.out.println();
        }
    }
}
```

Output:

Enter the number of rows for floyd's triangle:

5

Floyd's triangle

1

2 3

4 5 6

7 8 9 10

11 12 13 14 15

12.GCD

```
package programs.numbers;

import java.util.Scanner;

public class GCD {

    static int gcd(int m,int n)
    {
        int r;
        while(n!=0)
        {
            r=m%n;
            m=n;
            n=r;
        }

        return m;
    }

    public static void main(String[] args)
    {
        int m,n;
        Scanner sc=new Scanner(System.in);
        System.out.println("\nEnter the value of m:");
        m=sc.nextInt();
        System.out.println("\nEnter the value of n:");
        n=sc.nextInt();

        int result=gcd(m,n);
        System.out.println("The GCD of two numbers is:"+result);
    }
}
```

Output:

Enter the value of m:

45

Enter the value of n:

5

The GCD of two numbers is:5

12.LCM

```
package programs.numbers;

import java.util.Scanner;

public class LCM
{
    public static void main(String args[])
    {
        int a,b,i,max,lcm = 0;
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the two numbers");
        a = sc.nextInt();
        b=sc.nextInt();

        max=a>b?a:b;
        for(i=0;i<max;i++)
        {
            if(max%a==0 && max%b==0)
            {
                lcm=max;
                break;
            }
            max++;
        }
        System.out.println("LCM of the two numbers = "+lcm);
    }
}
```

Output:

```
Enter the two numbers
6 76
LCM of the two numbers = 228
```

13.Prime number

```
package programs.numbers;

public class PrimeNumber
{
    public static void main(String[] args)
    {
        System.out.println("Prime Number is::\n");

        for (int i = 0; i < 50; i++)
        {
            boolean isPrime = true;

            for(int j = 2; j < i; j++)
            {
                if((i % j) == 0)
                {
                    isPrime = false;
                    break;
                }
            }

            if(isPrime)
            {
                System.out.print(i + " ");
            }
        }
    }
}
```

Output:

Prime Number is::

0 1 2 3 5 7 11 13 17 19 23 29 31 37 41 43 47

13.Pyramid Pattern 1

```
package programs.numbers;

public class PyramidPattOne {

    public static void main(String[] args) {

        System.out.println("The Pattern is");
        for (int i = 0; i < 5; i++)
        {
            for (int j = 0; j < 5; j++)
            {
                if (j <= i)
                {
                    System.out.print(" *");
                }
                else
                {
                    System.out.print(" ");
                }
            }
            System.out.println();
        }
    }
}
```

Output:

```
The Pattern is
*
* *
* * *
* * * *
* * * * *
```

14.Pyramid Pattern 2

```
package programs.numbers;

public class PyramidPattTwo {

    public static void main(String[] args) {

        for (int i = 0; i < 5; i++)
        {
            for (int j = 0; j < 5 - i; j++)
            {
                System.out.print(" ");
            }
            for (int k = 0; k <= i; k++)
            {
                System.out.print("* ");
            }
            System.out.println();
        }
    }
}
```

Output:

```
      *
     * *
    * * *
   * * * *
  * * * * *
```


15.Sum Digits Of Numbers

```
package programs.numbers;

import java.util.Scanner;

public class SumDigitsOfNumbers
{
    public static void main(String args[])
    {
        int m, n, sum = 0;
        Scanner s = new Scanner(System.in);
        System.out.print("Enter the number:");
        m = s.nextInt();
        while (m > 0)
        {
            n = m % 10;
            sum = sum + n;
            m = m / 10;
        }
        System.out.println("Sum of Digits:" + sum);
    }
}
```

Output:

```
Enter the number:568
Sum of Digits:19
```

16.Swap two numbers using Third Variable

```
package programs.numbers;

import java.util.Scanner;

public class SwapTwoNumbersUsingThirdVar
{
    public static void main(String[] args)
    {
        int x,y,temp;
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the value for x and y:");

        x=sc.nextInt();
        y=sc.nextInt();

        temp=x;
        x=y;
        y=temp;

        System.out.println("Value of X and Y is:"+x+"Y="+y);
    }
}
```

Output:

Enter the value for x and y:

4 5

Value of X and Y is:X=5Y=4

17.Swap two numbers without using Third Variable

```
package programs.numbers;

import java.util.Scanner;

public class SwapTwoNumbersWOUsingThirdVar
{
    public static void main(String[] args)
    {
        int x,y,temp;
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the value for xand y:");

        x=sc.nextInt();
        y=sc.nextInt();

        System.out.println("Value of X and Y before swapping
is:"+x+"Y="+y);

        x=x+y;
        y=x-y;
        x=x-y;

        System.out.println("Value of X and Y after swapping
is:"+x+"Y="+y);
    }
}
```

Output:

```
Enter the value for xand y:
5 6
Value of X and Y before swapping is:X=5Y=6
Value of X and Y after swapping is:X=6Y=5
```

STRINGS

18.Anagrams

```
package programs.strings;

import java.util.Arrays;

public class Anagrams
{
    public static void main(String[] args)
    {
        String s1 = "integral";
        String s2 = "Triangle";
        char[] c1 = s1.toLowerCase().toCharArray();
        char[] c2 = s2.toLowerCase().toCharArray();

        Arrays.sort(c1);
        Arrays.sort(c2);

        if (Arrays.equals(c1, c2))
            System.out.println("s1 is anagram of s2");
        else
            System.out.println("Strings are not anagram");
    }
}
```

Output:

s1 is anagram of s2

19.Count Occurances Of each character in a string

```
package programs.strings;

public class OccurancesOfEachCharacterInString {
    public static void main(String[] args) {
        String s1 = "aaabbc";
        StringBuilder result = new StringBuilder();
        char currChar;
        int count = 0;

        for (int i = 0; i < s1.length(); i++) {
            currChar = s1.charAt(i);
            count = 1;

            while (i < s1.length() - 1 && s1.charAt(i + 1) == currChar) {
                count++;
                i++;
            }

            result.append(currChar);
            result.append(count);
        }

        System.out.println("" + result);
    }
}
```

Output:

a3b2c1

20.Duplicate Character HashMap

```
package programs.strings;

import java.util.HashMap;
import java.util.Map;
import java.util.Scanner;

public class DuplicateCharacterHashMap {
    public static void main(String[] args)
    {
        String name = "Bissssmmayaa";
        char[] ar = new char[name.length()];
        for (int i = 0; i < name.length(); i++) {
            ar[i] = name.charAt(i);
        }
        Map<Character, String> map=new HashMap<Character, String>();
        for (int i = 0; i < ar.length; i++) {
            int count=0;
            for (int j = 0; j < ar.length; j++) {
                if(ar[i]==ar[j]){
                    count++;
                }
            }
            map.put(ar[i], count+" no of times");
        }
        System.out.println(map);
    }
}
```

Output:

{a=3 no of times, B=1 no of times, s=4 no of times, i=1 no of times, y=1 no of times, m=2 no of times}

21.Palindrome

```
package programs.strings;
```

```
public class OccurancesOfEachCharacterInString
```

```
{
    public static void main(String[] args)
    {
        String s1 = "aaabbc";
        StringBuilder result = new StringBuilder();
        char currChar;
        int count = 0;

        for (int i = 0; i < s1.length(); i++)
        {
            currChar = s1.charAt(i);
            count = 1;

            while (i < s1.length() - 1 && s1.charAt(i + 1) == currChar)
            {
                count++;
                i++;
            }

            result.append(currChar);
            result.append(count);
        }

        System.out.println("" + result);
    }
}
```

Output:

Not a palindrome

21.Reverse Every Word In Sentence

```
package programs.strings;

public class ReverseEveryWordInSentence
{
    public static void main(String[] args)
    {
        String temp = "This is interview question";
        int strLeng = temp.length();
        int i = 0;
        String reverse = "";
        for (int j = temp.length() - 1; j >= 0; j--)
        {
            reverse += temp.charAt(j);
            if ((j == 0) && (i != strLeng))
            {
                reverse += " ";
            }
        }

        System.out.println("Reverse:" + reverse);
    }
}
```

Output:

Reverse: noitseuq weivretni si sihT

22.Reverse Sentence

```
package programs.strings;

public class ReverseSentence
{
    public static void main(String[] args)
    {
        String str = "This is interview question";
        String words[] = str.split(" ");
        for (int i = words.length - 1; i >= 0; i--)
        {
            System.out.print(words[i] + " ");
        }
    }
}
```

Output:

question interview is This

23. String Reverse

```
package programs.strings;

import java.util.Scanner;

public class StringReverse
{
    public static void main(String[] args)
    {
        System.out.println("Enter string to reverse:");

        Scanner read = new Scanner(System.in);
        String str = read.nextLine();
        String reverse = "";

        for (int i = str.length() - 1; i >= 0; i--)
        {
            reverse = reverse + str.charAt(i);
        }

        System.out.println("Reversed string is:");
        System.out.println(reverse);
    }
}
```

Output:

```
Enter string to reverse:
lavanya
Reversed string is:
aynaval
```