# Coding Questions

1. **Write a Java Program to print the sum of the first N natural number**
   **Input : 5**
   **Output: 15**

```java
import java.util.*;
public class Abc
{
    public static void main(String[] args)
    {
        int n;
        int sum=0;
        System.out.println("enter n value");
        Scanner sc1= new Scanner(System.in);
        n=sc1.nextInt();
        for(int i = 1; i <= n; i++)
        {
            sum += i;
        }
        System.out.print(sum);
    }
}
```

2. **Find smallest of three numbers using ternary operator**

```java
import java.util.*;
public class Abc
{
    public static voidmain(String[] args)
    {
        int a, b, c, smallest;
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter numbers ");
        a = sc.nextInt();
        b = sc.nextInt();
        c = sc.nextInt();
        smallest = c < (a < b ? a : b) ? c : ((a < b) ? a : b);
        System.out.println("The smallest number is: "+smallest);
    }
}
```

3. **Write a java program to check whether the number is prime or not**
   **Input:32**
   **Output: Not a Prime Number**

```java
import java.util.Scanner;
public class Abc
{
        public static void main(String []args)
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("enter a number");
                int num= sc.nextInt();
                boolean flag = false;
                for (int i = 2; i <= num / 2; ++i)
                 {
                        if (num % i == 0)
                         {
                                 flag = true;
                                break;
                         }
                }
                if (!flag)
                        System.out.println("Prime Number");
                else
                        System.out.println("Not a Prime Number");
        }
}
```

4. **Write a Java program to print first N prime numbers.**
   **Input: 30**
   **Output: 2 3 5 7 11 13 17 19 23 29**

```java
import java.util.*;
public class Abc
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                System.out.print("enter n value ");
                int x=sc.nextInt();
                solution(x);
        }
        public static void solution(int n)
        {
```

```java
        int flag=0;
        for(int i=2;i<=n;i++)
        {
                if(i== 2 || i == 3)
                        System.out.print(i+" ");
                else
                        flag=0;
                for(int j=2;j<=i/2;j++)
                {
                        if(i%j==0)
                        {
                        flag=1;
                        break;
                        }
                }
                if(flag == 0)
                        System.out.print(i+" ");
        }
    }
}
```

## 5. Write a Java Program to Swap Two Numbers Using Bitwise Operator

```java
package hello;
import java.util.*;
public class Abc
{
        public static void main(String[] args)
        {
                int a, b;
                Scanner scanner = new Scanner(System.in);
                System.out.print("Enter the first number: ");
                a = scanner.nextInt();
                System.out.print("Enter the second number: ");
                b = scanner.nextInt();
                System.out.println("Before swapping:");
                System.out.println("a = " +a +", b = " +b);
                a = a ^ b;
                b = a ^ b;
                a = a ^ b;
                System.out.println("After swapping:");
                System.out.print("a = " +a +", b = " +b);
        }
}
```

**6. Write a program to check for even or odd**

**Input: 56**

**Output: even number**

**Input: 33**

**Output: odd number**

```java
import java.util.Scanner;
public class Abc
{
        public static void main(String [] args)
        {
                Scanner sc=new Scanner(System.in);
                System.out.print("enter number");
                int n=sc.nextInt();
                if(n%2==0)
                        System.out.println("even number");
                else
                        System.out.println("odd number");
        }
}
```

**7. Write a Java program to check a number is palindrome or not.**

**Input: 454**

**Output: palindrome number**

**Input: 723**

**Output: not palindrome**

```java
import java.util.*;
public class Abc
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("enter the number");
                int num= sc.nextInt();
                solution(num);
        }
        public static void solution(int n)
        {
                int r,sum=0,temp;
                temp=n;
                while(n>0)
                {
                        r=n%10;
```

```
                    sum=(sum*10)+r;
                    n=n/10;
            }
            if(temp==sum)
                    System.out.println("palindrome number");
            else
                    System.out.println("not palindrome");
    }
}
```

8. **Write a Java program to check if a number is Armstrong number or not.**
   **Input: 153**
   **Output: Armstrong Number**
   **Input: 77**
   **Output: Not Armstrong Number**

```
import java.util.*;
public class Abc{
      public static void main(String args[])
      {
              Scanner sc=new Scanner(System.in);
              System.out.print("enter number");
              int num= sc.nextInt();
              int temp, digits=0, last=0, sum=0;
              temp=num;
              while(temp>0)
              {
                      temp = temp/10;
                      digits++;
              }
              temp = num;
              while(temp>0)
              {
                      last = temp % 10;
                      sum +=  (Math.pow(last, digits));
                      temp = temp/10;
              }
              if(num==sum)
                      System.out.println("Armstrong Number");
              else
                      System.out.println("Not Armstrong Number");
      }
}
```

## 9. Write a Java program to print the Armstrong numbers within a range
**Input: 1 200**
**Output: 1 2 3 4 5 6 7 8 9 153**

```java
import java.util.Scanner;
public class Armstrong_Range
{
        public static void main(String[] args)
        {
                int count=0,i,temp=0,rem;
                double sum=0;
                Scanner sc=new Scanner(System.in);
                int start=sc.nextInt();
                int end=sc.nextInt();
                for(i=start;i<=end;i++)
                {
                        temp=i;
                        sum=0;count=0;
                        while(i!=0)
                        {
                                i=i/10;
                                count++;
                        }
                        i=temp;
                        while(i!=0)
                        {
                        rem=i%10;
                        i=i/10;
                        sum=sum+Math.pow(rem, count);
                        }
                        i=temp;
                        if(temp==sum)
                        System.out.println(i);
                }
        }
}
```

## 10. Write a Java program to print a number in reverse order.
**Input: 2134**
**Output: 4312**

```java
import java.util.*;
public class Abc
{
        public static void main(String args[])
```

```
        {
                Scanner sc=new Scanner(System.in);
                System.out.print("enter n value");
                int n=sc.nextInt();
                solution(n);
        }
        public static void solution(int number)
        {
        int reverse = 0,remainder=0;
        while(number != 0)
        {
                remainder = number % 10;
                reverse = reverse * 10 + remainder;
                number = number/10;
        }
        System.out.println(reverse);
        }
}
```

**11. Write a java program to print first n Fibonacci series**
**Fibonacci series is a series of elements where the two previous numbers are added to get the next number.**
**Input: 15**
**Output: 0 1 1 2 3 5 8 13 21 34 55 89 144 233 377**

```
import java.util.*;
public class Abc{
        public static void main(String args[]){
                Scanner sc = new Scanner(System.in);
                System.out.println("enter number");
                int n =sc.nextInt();
                int num1 = 0, num2 = 1;
                int counter = 0;
                while (counter < n)
                {
                        System.out.print(num1 + " ");
                        int num3 = num2 + num1;
                        num1 = num2;
                        num2 = num3;
                        counter = counter + 1;
                }
        }
}
```

12. **Write a Java program to check if a number is Happy number or not.**
    **Example:**
    **19 is Happy Number,**
    **1^2 + 9^2 = 82**
    **8^2+2^2=68**
    **6^2+8^2=100**
    **1^2+0^2+0^2=1**

```java
import java.util.*;
public class Abc
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("enter number");
                int num=sc.nextInt();
                if (solution(num))
                System.out.println("Happy number");
                else
                System.out.println("Not Happy number");
        }
        public static boolean solution(int n)
        {
                if (n == 1 || n == 7)
                        return true;
                int sum = n, x = n;
                while(sum > 9)
                {
                        sum = 0;
                        while (x > 0)
                        {
                                int d = x%10;
                                sum += d*d;
                                x/=10;
                        }
                        if (sum == 1)
                                return true;
                        x = sum;
                }
                if(sum == 7)
                        return true;
                        return false;
        }}
```

**13. Write a Java program to print the digits of a number in different line.**

**Input: 32145**

**Output:**

**3**

**2**

**1**

**4**

**5**

```java
import java.util.*;
public class Abc
{
        public static void main(String args[])
         {
                Scanner sc=new Scanner(System.in);
                System.out.print("enter number");
                int n=sc.nextInt();
                int i, temp, count=0;
                temp=n;
                while (temp>0)
                {
                        count++;
                        temp = temp/10;
                }
                double num = Math.pow(10, count-1);
                i = (int)num;
                for (;i>0;i/=10)
                        System.out.println(n/i%10);
        }
}
```

**14.  Write a java program to check if a number is Strong number or not.**
**Suppose we have a number 145 then,**
**Factorial of all digits –**
**Factorial of 1 = 1 ;**
**Factorial of 4 = 24 ;**
**Factorial of 5 = 120 ;**
**sum of Factorial of all digits –**
**1 + 24 + 120 = 145 ;**
**Here the calculated result is equal to the given number**
**So, 145 is a Strong Number.**

```
import java.util.*;
public class Abc
{
        public static void main(String args[])
         {
                Scanner sc=new Scanner(System.in);
                System.out.println("enter the number");
                int n=sc.nextInt();
                int fac,temp,sum = 0;
                temp=n;
                while(n != 0)
                {
                        fac = 1;
                        int r = n % 10;
                        for(int i = r ; i >= 1 ; i--)
                                fac = fac * i;
                                sum = sum + fac;
                                n=n/10;
                }
                if(sum == temp)
                        System.out.println("Strong Number");
                else
                        System.out.println("Not a Strong Number");
        }
}
```

15. **Write a Java program to calculate the GCD and LCM of two numbers. (No need to print the values, only return the values to the main method)**
    **Example:**
    **Input: 20 30**
    **Output: 10 60**

```
import java.util.Scanner;
public class Abc
{
        public static void main(String[] args)
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("enter numbers");
                int a =sc.nextInt();
                int b = sc.nextInt();
                int gcdValue;
                gcdValue = gcd(a, b);
```

```
                    System.out.print(gcdValue + " ");
                    System.out.println(lcm(a, b));
        }
        static int gcd(int x, int y)
        {
                int  gcd=1;
                for(int i = 1; i <= x && i <= y; i++)
                {
                        if(x%i==0 && y%i==0)
                                gcd = i;
                }
                return gcd;
        }
        static int lcm(int a, int b)
        {
                int lcm=0;
                lcm=(a*b)/gcd(a,b);
                return lcm;
        }
}
```

16. **Write a Java program to check a number is Palindrome-Prime or not.
    Example: 313 is a PalPrime number because after reversing that
    number,the number retains its original value, and the number is also
    divisible by only one or itself.**
    **Input : 313**
    **Output: PalPrime number**
    **Input: 252**
    **Output: not a Palprime number**

```
import java.util.Scanner;
public class Abc
{
        public static void main(String []args)
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("enter a number");
                int num= sc.nextInt();
                int temp, rem, i;
                int count = 0;
                int sum = 0;
                temp = num;
                for(i = 1; i <= temp; i++)
```

```
                if(temp%i == 0)
                        count++;
        while(num > 0)
        {
                rem = num%10;
                sum = sum*10+rem;
                num = num/10;
        }
        if(temp == sum && count == 2)
                System.out.println("PalPrime number");
        else
                System.out.println("not a PalPrime number");
    }
}
```

17. **Write a java program to find the sum of the digits in a number**
    **Input:48**
    **Output:12**
    **Explanation:**
    **Input: 48 add each digit individually**
    **4+8=12**
    **so the output is 12**

```
import java.util.Scanner;
public class Abc
{
        public static void main(String[] args)
        {
                Scanner sc = new Scanner(System.in);
                System.out.println("enter number");
                int n =sc.nextInt();
                int sum = 0;
                while (n != 0)
                {
                        sum = sum + n % 10;
                        n = n/10;
                }
                System.out.println(sum);
        }
}
```

# Pattern

**18.   Write a java program to print the below pattern.**
**\*\*\*\*\***
**\*\*\*\***
**\*\*\***
**\*\***
**\***

```java
public class Abc
{
        public static void main(String[] args)
        {
                    for(int i=2;i<=input;i++)
                    {
                            for(int j=input;j>=i;j--)
                             {
                                    System.out.print("*");
                             }
                            System.out.println(" ");
                    }
        }
}
```

**19.   Write a java program to print the below pattern**
```
      *
    * * *
  * * * * *
 * * * * * * *
* * * * * * * * *
```

```java
public class Abc
{
   public static void main(String[] args)
   {
      int rows = 5, k = 0;
       for (int i = 1; i <= rows; ++i, k = 0)
       {
               for (int space = 1; space <= rows - i; ++space)
               {
                       System.out.print("  ");
               }
               while (k!=2*i-1)
               {
                       System.out.print("* ");
```

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```
                    ++k;
                }
            System.out.println();
            }
        }
}
```

**20. Write a java program to print the below pattern**

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

```
public class Abc
{
        public static void main(String[] args)
        {
                for(int i=1;i<=6;i++)
                {
                        for(int j=1;j<=6;j++)
                        {
                                if(i==1||j==1||i==6||j==6)
                                        System.out.print("*");
                                else
                                        System.out.print(" ");
                                System.out.println(" ");
                        }
                }
        }
}
```

**21. Write a java program to print the below pattern**

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

```
public class Abc
{
        public static void main(String[] args)
        {
                int rows = 5;
                for (int i = 1; i <= rows; ++i)
                {
```

```
                for (int j = 1; j <= i; ++j)
                {
                        System.out.print("* ");
                }
                System.out.println();
            }
        }
}
```

## 22. Write a java program to print the below pattern

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

```
public class Abc
{
        public static void main(String[] args)
        {
                int rows = 5;
                for(int i = rows; i >= 1; --i)
                {
                        for(int space = 1; space <= rows - i; ++space)
                        {
                                System.out.print("  ");
                        }
                        for(int j=i; j <= 2 * i - 1; ++j)
                        {
                                System.out.print("* ");
                        }
                        for(int j = 0; j < i - 1; ++j)
                        {
                                System.out.print("* ");
                        }
                        System.out.println();
                }
        }
}
```

**23. Write a java program to print the below pattern**

**1**
**2 3**
**4 5 6**
**7 8 9 10**

```java
public class Pattern
{
        public static void main(String[] args)
        {
                int value = 1,rows =4;
                for (int i = 1; i <= rows; i++)
                {
                        for (int j = 1; j <= i; j++)
                        {
                                System.out.print(value+" ");
                                value++;
                        }
                        System.out.println();
                }
        }
}
```

**24. Write a java program to print the below pattern**

**1**
**2 2**
**3 3 3**
**4 4 4 4**

```java
public class Pattern
{
        public static void main(String[] args)
        {
                int rows =4;
                 for (int i = 1; i <= rows; i++)
                 {
                 for (int j = 1; j <= i; j++)
                 {
                        System.out.print(i+" ");
                 }
                System.out.println();
                 }
        }
}
```

**25. Write a java program to print the below pattern**

5 5 5 5 5
4 4 4 4
3 3 3
2 2
1

```java
public class Pattern
{
        public static void main(String[] args)
        {
         int rows =5,value=5;
                for (int i = 1; i <= rows; i++)
                {
                        for (int j = i; j <= rows; j++)
                        {
                                System.out.print(value+" ");
                        }
                         value--;
                        System.out.println();
                }
        }
}
```

# Array Programs

**26. Write a Java program count the number of odd and even elements in given array.**
**Input:[1,3,4,7,5,2,6]**
**Output: 4 3**

```java
import java.util.*;
public class Abc
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                System.out.print("enter n value");
                int n=sc.nextInt();
                int [] arr= new int[n];
                System.out.print("enter array elements");
                for(int i=0;i<arr.length;i++)
                {
                        arr[i]=sc.nextInt();
                }
                int size=n;
                int odd_count=0,even_count=0;
                for(int i = 0; i < size; i++)
                {
                        if(arr[i]%2!=0)
                                odd_count++;
                        else
                                even_count++;
                }
                System.out.print(odd_count+" "+even_count);
        }
}
```

**27. Write a java program to count the number of occurrences in an array**
**Input: 4 5 2 1 4**
**Output:**
**4-2**
**5-1**
**2-1**
**1-1**

```java
import java.util.Scanner;
public class Abc
{
        public static void main(String []args)
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("enter size of array");
                int n= sc.nextInt();
                int []arr=new int[n];
                System.out.println("enter array elements");
                for(int i=0;i<n;i++)
                {
                        arr[i]=sc.nextInt();
                }
                boolean visited[] = new boolean[n];
                for (int i = 0; i < n; i++)
                {
                        if (visited[i] == true)
                                continue;
                        int count = 1;
                        for (int j = i + 1; j < n; j++)
                        {
                                if (arr[i] == arr[j])
                                {
                                        visited[j] = true;
                                        count++;
                                }
                        }
                        System.out.println(arr[i] + "-" + count);
                }
        }
}
```

28. **Write a Java program to check if two arrays are equal or not.( No need to print "Yes" or "No", only return true to the main method if the arrays are same else return false)**
**Input : arr1[] = {1, 2, 5, 4, 0};**
**        arr2[] = {2, 4, 5, 0, 1};**
**Output : Yes**
**Input : arr1[] = {1, 7, 1};**
**        arr2[] = {7, 7, 1};**
**Output : No**

```java
import java.util.*;
public class Abc
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("enter array size");
                int n=sc.nextInt();
                int [] arr1= new int[n];
                int [] arr2= new int[n];
                System.out.println("enter array1");
                for(int i=0 ;i<n;i++)
                {
                        arr1[i]=sc.nextInt();
                }
                System.out.println("enter array 2");
                for( int i=0;i<n;i++)
                {
                        arr2[i]=sc.nextInt();
                }
                boolean res=solution(arr1, arr2);
                if(res==true)
                        System.out.print("Yes");
                else
                        System.out.print("No");
        }
        public static boolean solution(int [] arr1,int [] arr2)
        {
                int n = arr1.length;
                int m = arr2.length;
                if (n != m)
                return false;
                Arrays.sort(arr1);
                Arrays.sort(arr2);
                for (int i = 0; i < n; i++)
                        if (arr1[i] != arr2[i])
                                return false;
                                return true;
        }
}
```

## 29. Write a Java Program to add two matrices

```java
import java.util.*;
public class Abc
{
        public static voidmain(String[] args)
        {
                int a[][]={{1,3,4},{2,4,3},{3,4,5}};
                int b[][]={{1,3,4},{2,4,3},{1,2,4}};
                int c[][]=new int[3][3];
                for(int i=0;i<3;i++)
                {
                        for(int j=0;j<3;j++)
                        {
                                c[i][j]=a[i][j]+b[i][j];
                                System.out.print(c[i][j]+" ");
                        }
                        System.out.println();
                }
        }
}
```

## 30. Write a Java program to print the unique elements of an array.

**Input: [1, 23, 10, 22, 11, 44, 1, 11, 43]**

**Output: UNIQUE ELEMENTS ARE: 23 10 22 44 43**

```java
public class Abc
{
        public static void main(String[] args)
        {
                int[] a=new int[] {1,23,10,22,11,44,1,11,43};
                int i,j;
                System.out.println("UNIQUE ELEMENTS ARE:");
                for(i=0;i<a.length;i++)
                {
                        int temp=0;
                        for(j=0;j<a.length;j++)
                                if((a[i]==a[j])&&(i!=j))
                                {
                                        temp++;break;
                                }
                        if(temp==0)
```

```
                {
                        System.out.println(a[i]);
                }
            }
        }
}
```

## 31. Write a Java program to print the duplicate elements of an array.

**Input: [1, 3, 6, 12, 4, 6, 3, 4]**

**Output: 3 6 4**

```java
import java.util.*;
public class Abc
{
    public static void main(String args[])
      {
      int n;
      Scanner sc=new Scanner(System.in);
      System.out.print("enter size of array");
      n = sc.nextInt();
      int [] arr= new int[n];
      System.out.print("enter  array elements");
      for(int i=0;i<n;i++)
            arr[i]=sc.nextInt();
      for(int i = 0; i < n; i++)
      {
            for(int j = i + 1; j < n; j++)
            {
                    if(arr[i] == arr[j])
                    System.out.print(arr[j]+" ");
            }
      }
   }
}
```

## 32. Write a Java program to print the median of array elements.
 **Input: [10.2 38.7 92.7 65.6]**
 **Output: 65.7**

```java
import java.util.*;
public class Abc
{
        public static void main(String args[])
```

```java
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("enter size of array");
                int  n=sc.nextInt();
                int [] arr= new int[n];
                System.out.println("enter array elements");
                for(int i=0;i<arr.length;i++)
                        arr[i]= sc.nextInt();
                double m=0;
                int x=arr.length;
                if(n%2==1)
                        m=arr[n/2];
                else
                        m=(arr[n/2-1]+arr[n/2])/2;
                System.out.println(m);
        }
}
```

## 33. Write a Java Program to rotate the elements of an array

```java
import java.util.*;
public class Abc
{
        public static void main(String[] args)
        {
                int[] a=new int[] {10,20,30,40,50,60,70};
                int temp,i;
                System.out.println("BEFORE ROTATION");
                for(int y: a)
                {
                        System.out.print(y+"  ");
                }
                temp=a[0];
                for(i=0;i<a.length-1;i++)
                {
                        a[i]=a[i+1];
                }
                a[i]=temp;
                System.out.println("\n AFTER ROTATION");
                for(i=0;i<a.length;i++)
                        System.out.print(a[i]+ " ");
        }
}
```

**34. Write a program to implement linear search**
**Input : 1 2 5 4 6 2**
**Output:Element Found**
**Input: 4 5 1 2 6 7 3**
**Output:Element not Found**

```java
import java.util.Scanner;
public class Abc
{
      public static void search(int arr[], int x)
      {
             int n=arr.length;
             int flag=0;
             for(int i = 0; i < n; i++)
             {
                    if(arr[i] == x)
                          flag =1;
             }
             if(flag == 1)
                    System.out.print("Element Found");
             else
                    System.out.print("Element not Found");
      }
      public static void main(String [] args)
      {
             Scanner sc=new Scanner(System.in);
             System.out.print("enter size of array");
             int n=sc.nextInt();
             int [] arr= new int[n];
             System.out.print("enter array elements ");
             for(int i=0;i<n;i++)
             {
                    arr[i]=sc.nextInt();
             }
             System.out.println("enter search element");
             int item =sc.nextInt();
             search(arr, item);
      }
}
```

**35. Write a java program to implement Bubble sort**
**Input: 4 5 8 6 7 2**
**Output: 2 4 5 6 7 8**

```java
import java.util.Scanner;
public class Abc
{
        public static void bubbleSort(int arr[])
        {
                int n = arr.length;
                for (int i = 0; i < n-1; i++)
                        for (int j = 0; j < n-i-1; j++)
                                if (arr[j] > arr[j+1])
                                {
                                        int temp = arr[j];
                                        arr[j] = arr[j+1];
                                        arr[j+1] = temp;
                                }
        }
        public static void printArray(int arr[])
        {
                int n = arr.length;
                for (int i=0; i<n; ++i)
                        System.out.print(arr[i] + " ");
                System.out.println();
        }
        public static void main(String args[])
        {
                Scanner sc = new Scanner(System.in);
                System.out.println("enter size of array");
                int n=sc.nextInt();
                int []a=new int[n];
                System.out.println("enter array elements");
                for (int i=0; i<a.length; ++i)
                        a[i]=sc.nextInt();
                bubbleSort(a);
                printArray(a);
        }
}
```

**36. Write a Java Program To Reverse An Array without using another array.**
**Input: [1 2 3 4]**
**Output: [4 3 2 1]**

```java
import java.util.Scanner;
public class Abc
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                System.out.print("enter size of array");
                int n=sc.nextInt();
                int [] arr= new int[n];
                System.out.print("enter array elements ");
                for(int i=0;i<arr.length;i++)
                {
                        arr[i]=sc.nextInt();
                }
                int temp=0;
                for( int i=0;i<n ; i++,n--)
                {
                        temp=arr[i];
                        arr[i]=arr[n-1];
                        arr[n-1]=temp;
                }
                for( int i=0; i < arr.length; i++)
                {
                        System.out.print(arr[i]+" ");
                }
        }
}
```

**37. Write a Java program to find all pairs of elements in Java array whose sum is equal to a given number**
**Input: 15 12 4 16 9 8 24 0 24**
**Output:**
**15,9**
**16,8**
**24,0**

```java
import java.util.Scanner;
public class Abc
{
```

```
public static void main(String args[])
{
        Scanner sc=new Scanner(System.in);
        System.out.print("enter size of array");
        int n=sc.nextInt();
        int [] arr= new int[n];
        System.out.print("enter array elements ");
        for(int i=0;i<n;i++)
        {
                arr[i]=sc.nextInt();
        }
        for(int i=0; i<arr.length; i++)
        {
                for (int j=i; j<arr.length; j++)
                {
                        if((arr[i]+arr[j])== n && i!=j)
                        {
                                System.out.println(arr[i]+","+arr[j]);
                        }
                }
        }
    }
 }
```

38. **Write a Java program to rearrange positive and negative numbers in an array.**
**Input: [1-2 -5 8 9 -3]**
**Output: -2 -5 -3 1 8 9**

```
import java.util.*;
public class Abc
{
        public static void main(String args[])
         {
                Scanner sc=new Scanner(System.in);
                System.out.print("enter size of array");
                int n=sc.nextInt();
                int [] arr= new int[n];
                System.out.print("enter array elements ");
                for(int i=0;i<n;i++)
                {
                        arr[i]=sc.nextInt();
                }
```

```
                int i,j;
                j = 0;
                for(i = 0; i < n; i++)
                {
                        if(arr[i] < 0)
                        {
                                if(i != j)
                                {
                                int temp = arr[i];
                                arr[i] = arr[j];
                                arr[j] = temp;
                                }
                                j++;
                        }
                }
                for(i = 0; i < n; i++)
                {
                        System.out.print(arr[i]+" ");
                }
        }
}
```

## 39. Write a program to print the sum of elements of an array
   **Input: 65 67 74 75**
   **Output: 281**

```java
import java.util.*;
public class Abc
{
        public static void main(String[] args)
        {
                int n;
                System.out.println("enter size of array");
                Scanner sc=new Scanner(System.in);
                n=sc.nextInt();
                int [] arr = new int [n];
                System.out.println("enter array elements");
                for(int i=0;i<arr.length;i++)
                {
                        arr[i]= sc.nextInt();
                }
                solution(arr);
        }
        public static void  solution(int []a)
```

```
        {
                int count = 0;
                for (int i = 0; i <a.length; i++)
                {
                count += a[i];
                }
                System.out.println(count);
        }
 }
```

## 40. Write a Java program for Selection Sorting
**Input: [4 3 5 2 7 1]**
**Output: 1 2 3 4 5 7**

```
import java.util.*;
public class Abc
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                System.out.print("enter n value");
                int n=sc.nextInt();
                int [] arr= new int[n];
                System.out.print("enter array elements");
                for(int i=0;i<n;i++)
                {
                        arr[i]=sc.nextInt();
                }
                for (int i = 0; i < n-1; i++)
                {
                        int min_idx = i;
                        for (int j = i+1; j < n; j++)
                                if (arr[j] < arr[min_idx])
                                        min_idx = j;
                                        int temp = arr[min_idx];
                                        arr[min_idx] = arr[i];
                                        arr[i] = temp;
                }
                for(int i=0;i<arr.length;i++)
                        System.out.print(arr[i]+" ");
        }
}
```

**41. Binary Search in Java. (No need to print only return the position of the search element in the array if found, else return -1 to the driver function if search element not found in the array)**
**Binary Search in Java is a search algorithm that finds the position of a target value within a sorted array.**
**Input: [19 28 15 17 83], 28**
**Output: Element found at index 4**
**Input: [19 28 15 17 83], 27**
**Output: Element not found**

```java
import java.util.*;
public class Abc
{
        public static void main(String args[])
        {
                int n;
                Scanner sc=new Scanner(System.in);
                System.out.print("enter search element");
                int searchElement=sc.nextInt();
                System.out.print("enter array size");
                n=sc.nextInt();
                int [] arr= new int[n-1];
                System.out.print("enter array elements");
                for(int i=0;i<arr.length-1;i++)
                        arr[i]=sc.nextInt();
                int result=solution(arr,searchElement);
                if (result == -1)
                        System.out.println("Element not found");
                else
                        System.out.println("Element found at "
                                        + "index " + result);
        }
        public static int solution(int [] arr,int x)
        {
                Arrays.sort(arr);
                int l = 0, r = arr.length - 1;
                while (l <= r)
                {
                        int m = l + (r - l) / 2;
                        if (arr[m] == x)
                                return m;
                        if (arr[m] < x)
                                l = m + 1;
```

```
                    else
                        r = m - 1;
            }
            return -1;
        }
}
```

**42. Write a java program to print the second largest number in an array.**
**Input: [19, 73, 82, 64, 53, 02]**
**Output: 73**

```
import java.util.*;
public class Abc
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                System.out.print("enter n value");
                int n=sc.nextInt();
                int [] arr= new int[n];
                System.out.print("enter array");
                for(int i=0;i<arr.length;i++)
                {
                        arr[i]=sc.nextInt();
                }
                solution(arr);
        }
        public static void solution(int [] arr)
        {
                Arrays.sort(arr);
                System.out.print(arr[arr.length-2]);
        }
   }
```

# Strings

**43. Write a Java program to check whether two strings are anagram or not?**
**Input:  race, care**
**Output: race and care are anagram**

```java
import java.util.*;
public class Abc
{
        public static void main(String[] args)
        {
                String str1 = "Race";
                String str2 = "Care";
                str1 = str1.toLowerCase();
                str2 = str2.toLowerCase();
            if(str1.length() == str2.length())
          {
                char[] charArray1 = str1.toCharArray();
                char[] charArray2 = str2.toCharArray();
                Arrays.sort(charArray1);
                Arrays.sort(charArray2);
                boolean result = Arrays.equals(charArray1, charArray2);
                if(result)
                System.out.println(str1 + " and " + str2 + " are anagram.");
                else
                System.out.println(str1 + " and " + str2 + " are not anagram.");
          }
           else
                System.out.println(str1 + " and " + str2 + " are not anagram.");
        }
}
```

**44. Write a Java Program to print number of words in a String**
**Input: You are doing java coding questions**
**Output: 6**

```java
import java.util.*;
public class Abc
{
        public static void main(String[] args)
        {
                System.out.println("enter a statement");
                Scanner sc=new Scanner(System.in);
                String s = sc.nextLine();
```

```
                solution(s);
        }
        public static void solution(String str)
        {
                int count = 1;
                for (int i = 0; i < str.length() - 1; i++)
                {
                        if ((str.charAt(i) == ' ') && (str.charAt(i + 1) != ' '))
                        {
                        count++;
                        }
                }
                System.out.println(count);
        }
}
```

**45. Write a Java Program to reverse a String.**
**Input: You are doing java coding questions**
**Output: snoitseuq gnidoc avaj gniod era uoY**

```
import java.util.*;
public class Abc
{
        public static void main(String[] args)
         {
                int i =0;
                String s = new String();
                Scanner sc=new Scanner(System.in);
                System.out.println("enter string");
                s=sc.nextLine();
                solution(s);
        }
        public static void solution(String str)
        {
                int length=str.length();
                String rev="";
                for(int i=length-1;i>=0;i--)
                        rev=rev+str.charAt(i);
                        System.out.println(rev);
        }
 }
```

**46.** **Write a java program to count vowels in a String.**
**Example:**
**Input: Apple**
**Output: 2**

```java
import java.util.*;
public class Abc
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("enter string");
                String s=sc.nextLine();
                int count = 0;
                s= s.toLowerCase();
                for (int i = 0; i < s.length(); i++)
                {
                        if (s.charAt(i) == 'a' || s.charAt(i) == 'e'
                        || s.charAt(i) == 'i'
                        || s.charAt(i) == 'o'
                        || s.charAt(i) == 'u')
                        {
                                count++;
                        }
                }
                System.out.println(count);
        }
}
```

**47.** **Given a string, we have to find the longest word in the input string and then calculate the number of characters in this word. (In Java)**
**Input: Java Coding Questions**
**Output: 9**

```java
import java.util.*;
public class Abc
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                System.out.print("enter a string");
                String s= sc.nextLine();
                solution(s);
        }
```

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```
public static void solution(String str)
{
        int n = str.length();
        int res = 0, curr_len = 0;
        for (int i = 0; i < n; i++)
        {
                if (str.charAt(i) != ' ')
                        curr_len++;
                else
                {
                        res = Math.max(res, curr_len);
                        curr_len = 0;
                }
        }
        System.out.print(Math.max(res, curr_len));
        }
}
```

48. **Write a Java Program to Remove a Given Word From a String.**
    **Input : This is the place**
    **word="the"**
    **Output : This is place**
    **Input : Hello world Hello**
    **word = Hello**
    **Output : world**
    **Input : Hello world**
    **word = not**
    **Output : Hello world**

```
import java.util.*;
public class Abc
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                System.out.print("enter search word");
                String word= sc.nextLine();
                System.out.print("enter string");
                String s= sc.nextLine();
                solution(s,word);
        }
        public static void solution(String str, String word)
        {
```

```
                String msg[] = str.split(" ");
                String new_str = "";
                for (String words : msg)
                {
                        if (!words.equals(word))
                                new_str += words + " ";
                }
                System.out.print(new_str);
        }
}
```

## 49. Write a java program to remove all vowels from String and print the string
**Input: hello**
**Output: hll**

```
import java.util.Scanner;
public class Abc
{
        public static void main(String[] args)
        {
                Scanner sc = new Scanner(System.in);
                System.out.println("enter string");
                String str=sc.nextLine();
                String result= str.replaceAll("[aeiouAEIOU]", "");
                System.out.println(result);
        }
}
```

## 50. Write a Java program to check a String is palindrome or not.
**Example:**
**Input: Mom**
**Output: palindrome**
**Input: Hello**
**Output: not palindrome**

```
import java.util.Scanner;
public class Abc
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                int i =0;
                System.out.println("enter string");
                String s =sc.nextLine() ;
```

```
                s=s.toLowerCase();
                solution(s);
        }
        public static void solution(String str)
        {

                String rev="";
                int length = str.length();
                for ( int i = length - 1; i >= 0; i-- )
                        rev = rev + str.charAt(i);
                if (str.equals(rev))
                        System.out.println("palindrome");
                else
                        System.out.println("not palindrome");
        }
}
```

## 51. Write a Java Program to change the case of alphabets in a String.
**Input: PacketPrep**
**Output: pACKETpREP**

```
import java.util.*;
public class Abc
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("enter string");
                String s= sc.nextLine();
                solution(s);
        }
        public static void solution(String str)
        {
        char c = 'a';
        int len = str.length();
        StringBuffer strBuffer = new StringBuffer(len);
        for (int i = 0; i < len; i++)
        {
                c = str.charAt(i);
                if (Character.isUpperCase(c))
                {
                        c = Character.toLowerCase(c);
                }
                else if (Character.isLowerCase(c))
                {
```

```
                        c = Character.toUpperCase(c);
                }
                strBuffer.append(c);
            }
            System.out.println(strBuffer);
        }
    }
```

**52.** **Write a Java program to replace duplicate word from a String with a given word (packetprep).**
**Input: Hello World Hello**
**Output: hello world packetprep**
**input: Hello World**
**Output: hello world**

```
import java.util.*;
public class Abc
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("enter string");
                String s= sc.nextLine();
                solution(s);
        }
        public static void solution(String str)
        {
                String sentence, result = "";
                String allWords[];
                sentence = str.toLowerCase();
                allWords = sentence.split(" ");
                for(int i=0; i<allWords.length; i++)
                {
                        for(int j=i+1; j<allWords.length; j++)
                        {
                                if(allWords[i].equals(allWords[j]))
                                {
                                        allWords[j] = "packetprep";
                                }
                        }
                }
                for(String word: allWords)
                {
```

```
            result = result + word + " ";
        }
        System.out.print(result);
    }
}
```

## 53. Write a program to count the number of characters in a string
**Input: Hello World**
**output:10**

```java
import java.util.Scanner;
public class Abc
{
    public static void main(String[] args)
    {
        Scanner sc=new Scanner(System.in);
        System.out.println("enter string");
        String str=sc.nextLine();
        solution(str);
    }
    public static void solution(String s)
    {
        int count = 0;
        for (int j = 0; j<s.length();j++)
        {
            if (s.charAt(j) !=32)
            {
                count++;
            }
        }
        System.out.println(count+" ");
    }
}
```

# OOPS

**54. Create an abstract class called Shape with methods setcolor( ) and getcolor( ) and area( ) as abstract method. Create subclasses Rectangle,Circle ,Square and implement the method area( )**

```java
public class Demo
{
        public static void main(String[] args)
        {
                Shape sq=new Square(5);
                sq.setColor("red");
                System.out.println("color of square is "+sq.getColor());
                sq.area();
                Shape re=new Rectangle(3,4);
                re.setColor("blue");
                System.out.println("color of rectangle is "+re.getColor());
                re.area();
                Shape ci=new Circle(6);
                ci.setColor("pink");
                System.out.println("color of circle is "+ci.getColor());
                ci.area();
        }
}
abstract class Shape
{
        String color;
        public String getColor()
        {
                return color;
        }
        public void setColor(String color)
        {
                this.color = color;
        }
        public abstract void area();
}
class Rectangle extends Shape
{
        int length,breadth,area;
        public Rectangle(int l,int b)
        {
                length=l;
```

```
                breadth=b;
        }
        public void area()
        {
                area=length*breadth;
                System.out.println("area of rectangle is "+area);
        }
}
class Circle extends Shape
{
        double  radius,area;
        public Circle(int r)
        {
                radius=r;
        }
        public void area()
        {
                area=Math.PI*radius*radius;
                System.out.printf("area of circle is %.2f ",area);
        }
}
class Square extends Shape
{
        int side,area;
        public Square(int s)
        {
                side =s;
        }
        public void area()
        {
                area=side*side;
                System.out.println("area of square is "+area);
        }
}
```

**55.** **Define an interface Calc1,define methods add( ) & sub( ). The method takes 2 double values as aruments . Define another interface Calc2 by extending from Calc1,define methods mul( ) & Div( ). The method takes 2 double values as aruments.**
**Derive a class Arithmetic_operations implementing Calc2,override the methods of interfaces**

**In the driver code (main class) create objects of implementation class and call the methods of interfaces and print the results**

```java
public class Demo
{
        public static void main(String[] args)
        {
                Arithmetic_operations obj=new Arithmetic_operations();
                obj.add(10, 20);
                obj.sub(20, 5);
                obj.mul(3, 4);
                obj.div(15, 5);
        }
}
interface Calc1
{
        abstract void add(double a,double b);
        abstract void sub(double a,double b);
}
interface Calc2 extends Calc1
{
        abstract void mul(double a,double b);
        abstract void div(double a,double b);
}
class Arithmetic_operations implements Calc2
{
        @Override
        public void mul(double a, double b)
        {
                double x=a;
                double y=b;
                System.out.println("Multiplication of "+x+" and "+y+" is "+(x*y));
        }
        @Override
        public void div(double a, double b)
        {
                double x=a;
                double y=b;
                System.out.println("Division of "+x+" and "+y+" is "+(x/y));
        }
        @Override
        public void add(double a, double b)
        {
```

```
            double x=a;
            double y=b;
         System.out.println("Addition of "+x+" and "+y+" is "+(x+y));
      }
      @Override
      public void sub(double a, double b)
      {
            double x=a;
            double y=b;
         System.out.println("Substraction of "+x+" and "+y+" is "+(x-y));
      }
}
```

**56. Create an abstract class called Employee with calsal( ) as abstract method. Create two subclasses Parttime_Employee and Fulltime_Employee and calculate the salary by implementing the method calsal( )**
**(For full time employee the salary is (wage)*( total no of days))**
**(For part time employee the salary is (hours per day)*( wage))**

```
public class Demo
{
      public static void main(String[] args)
      {
            Employee  f=new Fulltime_Emp(30,20000);
            Employee  p=new Parttime_Emp(5,300);
            f.calsal();
            p.calsal();
      }
}
 abstract class Employee
{
      public abstract void calsal();
}
class Fulltime_Emp extends Employee
{
      int day,wage;
      public Fulltime_Emp(int day,int wage)
      {
            this.day=day;
            this.wage=wage;
      }
      public void calsal()
      {
```

```
                int sal=day*wage;
                System.out.println("sal of full time employee "+sal);
        }
}
class Parttime_Emp extends Employee
{
        int hrs,wage;
        public Parttime_Emp(int hrs,int wage)
        {
                this.hrs=hrs;
                this.wage=wage;
        }
        public void calsal()
        {
                int sal=hrs*wage;
                System.out.println("sal of part time employee "+sal);
        }
}
```

# EXCEPTION HANDLING

**57. Write a program to implement multiple catch blocks with one try block**

```java
public class MultipleCatchBlock1
{
        public static void main(String[] args)
        {
                try
                {
                        int a[]=new int[5];
                        a[5]=30/0;
                }
                catch(ArithmeticException e)
                {
                        System.out.println("Arithmetic Exception occurs");
                }
                catch(ArrayIndexOutOfBoundsException e)
                {
                        System.out.println("ArrayIndexOutOfBounds Exception
                        occurs");
                }
                catch(Exception e)
                {
                        System.out.println("Parent Exception occurs");
                }
                System.out.println("rest of the code");
        }
}
```

**58. Write a program to accept age of a person ,if the age of the person is less than 18years ,create a user defined exception called InvalidAgeException**

```java
class InvalidAgeException  extends Exception
{
        public InvalidAgeException (String str)
        {
                // calling the constructor of parent Exception
                super(str);
        }
}
// class that uses custom exception InvalidAgeException
public class TestCustomException1
{
```

```java
        // method to check the age
        static void validate (int age) throws InvalidAgeException
        {
                if(age < 18)
                {
                        // throw an object of user defined exception
                        throw new InvalidAgeException("age is not valid to vote");
                }
                else
                {
                        System.out.println("welcome to vote");
                }
        }

        // main method
        public static void main(String args[])
        {
                try
                {
                        // calling the method
                        validate(13);
                }
                catch (InvalidAgeException ex)
                {
                        System.out.println("Caught theexception");
                        // printing the message from InvalidAgeException object
                        System.out.println("Exception occured: " + ex);
                }
                System.out.println("rest of the code...");
        }
}
```

**59. Write a program to create a class Bank with deposit( ),withdraw( ), balancecheck( ) as the methods .Create a custom Exception when withdraw amount is greater than balance amount**

```java
import java.util.*;
public class TestAccount
{
        public static void main(String[] args)
        {
        Scanner input=new Scanner(System.in);
        System.out.println("Enter the Opening balance");
        int bal=input.nextInt();
```

```java
        Account acct1=new Account(bal);
        System.out.println("Enter the deposit amt");
        bal=input.nextInt();
        acct1.deposit(bal);
        System.out.println("Enter the withdraw amt");
        bal=input.nextInt();
        acct1.withdraw(bal);
        }
}
class Account
{
        int balance;
        public Account(int bal)
        {
                this.balance=bal;
        }
        public void deposit(int amt)
        {
                balance+=amt;
                System.out.println("Deposit Completed...");
                System.out.println("Current Balance: "+balance);
        }
        void withdraw(int amt)
        {
                try
                {
                        if(amt>balance)
                                throw new InsufficientBalance(balance);
                        balance-=amt;
                        System.out.println("Withdraw Completed");
                        System.out.println("Current Balance: "+balance);
                }
                catch(InsufficientBalance exp)
                {
                        System.out.println("Insufficient Balance");
                        System.out.println(exp);
                }
        }
}
class InsufficientBalance extends Exception
{
        int balance;
        public InsufficientBalance(int bal)
```

```
        {
                this.balance=bal;
        }
        public String toString()
        {
                return "Current Balance is: "+balance;
        }
}
```

# THREADS & MULTITHREADING

**60. Write a program to create a thread by using Runnable interface**

```java
public class Tdemo implements Runnable
{
        public void run()
        {
                System.out.println("Thread has ended");
        }
        public static void main(String[] args)
        {
                Tdemo ex = new Tdemo();
                Thread t1= new Thread(ex);
                t1.start();
                System.out.println("Hi");
        }
}
```

**61. Write a program to create multiple threads in a class and assign different priorities**

```java
public class Tdemo extends Thread
{
        public void run()
        {
                System.out.println("Inside the run() method");
        }
        public static void main(String[] args)
        {
                Tdemo th1 = new Tdemo();
                Tdemo th2 = new Tdemo();
                Tdemo th3 = new Tdemo();
                System.out.println("Priority of the thread th1 is : " +
                th1.getPriority());
                System.out.println("Priority of the thread th2 is : " +
                th2.getPriority());
                System.out.println("Priority of the thread th3 is : " +
                th3.getPriority());
                th1.setPriority(6);
                th2.setPriority(3);
                th3.setPriority(9);
                System.out.println("Priority of the thread th1 is : " +
                                th1.getPriority());
```

```
            System.out.println("Priority of the thread th2 is : " +
                            th2.getPriority());
            System.out.println("Priority of the thread th3 is : " +
                            th3.getPriority());
            System.out.println("Currently Executing The Thread : " +
            Thread.currentThread().getName());
            System.out.println("Priority of the main thread is : " +
                            Thread.currentThread().getPriority());
            Thread.currentThread().setPriority(10);
            System.out.println("Priority of the main thread is : " +
                            Thread.currentThread().getPriority());
        }
}
```

## 62. Write a java program on sleep method

```
class TestSleepMethod1 extends Thread
{
        public void run()
        {
                for(int i=1;i<5;i++)
                {
                        // the thread will sleep for the 500 milli seconds
                        try
                        {
                                Thread.sleep(500);
                        }
                        catch(InterruptedException e)
                        {
                                System.out.println(e);
                        }
                    System.out.println(i);
                }
        }
        public static void main(String args[])
        {
                TestSleepMethod1 t1=new TestSleepMethod1();
                TestSleepMethod1 t2=new TestSleepMethod1();
                t1.start();
                t2.start();
        }
}
```

## 63. Write a java program on inter thread communication

```java
public class ThreadA
{
        public static void main(String[] args) throws InterruptedException
        {
                ThreadB b = new ThreadB();
                b.start();
                synchronized (b)
                {
                        System.out.println("main  calling wait() method"); // step 1
                        b.wait();
                        System.out.println("main  got notification call"); // step 4
                        System.out.println("total balance " + b.totalBalance);
                }
        }
}
class ThreadB extends Thread
{
        int totalBalance = 0;
        public void run()
        {
                synchronized (this)
                {
                    System.out.println("child starts calculation for total "); // step 2
                      for (int i = 0; i <= 50; i++)
                      {
                              totalBalance = totalBalance + i;
                      }
                    System.out.println("child  gives notification call"); // step 3
                    this.notify();
                }
        }
}
```

# COLLECTIONS

**64. Write a program to display elements of collection in reverse order**

```
import java.util.*;
public class MyClass
{
        public static void main(String args[])
        {
                List<Integer>  li = new ArrayList<>();
                li.add(22);
                li.add(44);
                li.add(88);
                li.add(11);
                li.add(33);
                System.out.println("In actual order :");
                ListIterator<Integer> itr = li.listIterator();
                while (itr.hasNext())
                {
                        System.out.print(" "+itr.next());
                }
                System.out.println("\n In reverse order :");
                while (itr.hasPrevious())
                {
                        System.out.print(" "+itr.previous());
                }
        }
}
```

**65. Write a program to convert an array to list and list to array**

```
import java.util.*;
public class Arraylistdemo
{
        public static void main(String[] args)
        {
                Scanner sc = new Scanner(System.in);
                System.out.println("Enter the size of the array to be created ");
                int size = sc.nextInt();
                String [] myArray = new String[size];
                for(int i=0; i<myArray.length; i++)
                {
                  System.out.println("Enter the element "+(i+1)+" (String)  ");
                  myArray[i]=sc.next();
```

```
                }
            List<String> list = Arrays.asList(myArray);
            System.out.println("Given array is converted to a list");
            System.out.println("Contents of list ::"+list);
            list.toArray(myArray);
            String[] mylist  = new String[list.size()];
            list.toArray(mylist);
            System.out.println("Given list is converted to an array");
            for(int i=0; i<mylist.length; i++)
            {
                System.out.println("Element at the index "+i+" is ::"+mylist[i]);
            }
        }
}
```

66. **Write a program to store user defined objects in the collection and display using the iterator**

```
import java.util.*;
public class Arraylistdemo
{
        public static void main(String[] args)
        {
                ArrayList <Employee> emp=new ArrayList<Employee>();
                Employee e[]=new Employee[2];
                e[0]=new Employee(1,"raju",10000);
                e[1]=new Employee(2,"ravi",20000);
                emp.add(e[0]);
                emp.add(e[1]);
                for(Employee obj: emp)
                {
                        obj.print();
                }
        }
}
class Employee
{
        int eid;
        String name;
        double sal;
        public Employee(int eid,String name,double sal)
        {
                this.eid=eid;
                this.name=name;
```

```
            this.sal=sal;
        }
        public void print()
        {

            System.out.println("id is "+eid + " name is "+name+" salary is "+sal);

        }
}
```

## 67. Write a program to find maximum and minimum element in a collection

```
import java.util.*;
public class Arraylistdemo
{
        public static void main(String[] args)
        {
                List<Integer> list = Arrays.asList(20, 10, 100, 140, 250);
                Integer max = Collections.max(list);
                System.out.println("Maximum element is: "+max);
                Integer min = Collections.min(list);
                System.out.println("Maximum element is: "+min);
        }
}
```

## 68. Write a program to add one collection element into other collection

```
import java.util.*;
public class Arraylistdemo
{
        public static void main(String[] args)
        {
                ArrayList arrayList = new ArrayList();
                arrayList.add("arl_element_1");
                arrayList.add("arl_element_4");
                arrayList.add("arl_element_2");
                arrayList.add("arl_element_5");
                arrayList.add("arl_element_3");

                Vector vector = new Vector( );
                vector.add("vec_element_1");
                vector.add("vec_element_6");
                vector.add("vec_element_7");
                vector.add("vec_element_4");
                vector.add("vec_element_2");
```

```java
                vector.add("vec_element_5");
                vector.add("vec_element_3");
                System.out.println("Vector Contains : " + vector);
                System.out.println("arraylist Contains : " + arrayList);
                Collections.copy(vector,arrayList);
                System.out.println("Vector elements after copy : " + vector);
        }
}
```

## 69. Write a program to copy one linkedlist element into other linkedlist

```java
import java.util.*;
public class Linkedlistdemo
{
        public static void main(String[] args)
        {
                LinkedList <String> c1 = new LinkedList <String> ();
                c1.add("Red");
                c1.add("Green");
                c1.add("Black");
                c1.add("White");
                c1.add("Pink");
                System.out.println("Original linked  list: " + c1);
                LinkedList <String> newc1 = new LinkedList <String> ();
                newc1 = (LinkedList)c1.clone();
                System.out.println("Cloned linked list: " + newc1);
        }
}
```

## 70. Write a program to print sum of elements of arraylist

```java
import java.util.*;
public class Sample
{
        public static void main(String[] args)
        {
                ArrayList<Integer> a=new ArrayList<>();
                a.add(10);
                a.add(20);
                a.add(30);
                a.add(40);
                a.add(50);
                int sum=0;
                System.out.println("retrieving using enhanced for loop");
                for(int item:a)
```

```java
        {
                sum=+item;
        }
        System.out.println(sum);
        Object [ ]intArray=a.toArray( );
        System.out.println("retrieving using toArray");
        sum=0;
        for(int i=0;i<intArray.length;i++)
        {
                Integer iob=(Integer)intArray[i];
                int val=iob.intValue( );
                sum=+val;
        }
        System.out.println(sum);
        System.out.println("retrieving using iterator");
        Iterator it=a.iterator( );
        while(it.hasNext( ))
        {
                Object obj=it.next( );
                Integer iob=(Integer)obj;
                int val=iob.intValue( );
                sum=+val;
        }
        System.out.println(sum);
    }
}
```