

Q1. Write a Java program to sort an array in ascending order?

```
import java.util.*;
public class Main
{
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        System.out.println("Enter size of array");
        int n = scan.nextInt();

        int arr[] = new int[n];
        for(int i=0;i<n;i++){
            arr[i] = scan.nextInt();
        }

        Arrays.sort(arr);

        System.out.println("sorted array is : ");
        for(int i=0;i<n;i++){
            System.out.print(arr[i]+" ");
        }
    }
}
```

Q 2.To check whether the given number is palindrome or not?

```
import java.util.*;
public class Main
{
    public static String isPalindrome(int n){
        int reverse = 0;
        int tmp = n;
        while(tmp!=0){
            int rem = tmp%10;
            reverse = reverse*10+rem;
            tmp = tmp/10;
        }

        return (reverse==n)?"palindrome ":"not a palindrome";
    }

    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        System.out.println("Enter size of array");
        int n = scan.nextInt();

        String ans = isPalindrome(n);
        System.out.println("number is : " + ans);
    }
}
```

Q3. Write a Java program to check whether a string is a palindrome or not?

```
import java.util.*;
public class Main
{
    public static String isPalindrome(String n){
        StringBuilder sb = new StringBuilder(n);
        String reverse = sb.reverse().toString();
        return (n.equals(reverse))?"palindrome ":"not a palindrome";
    }
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        System.out.println("Enter a string");
        String n = scan.nextLine();
        |
        String ans = isPalindrome(n);
        System.out.println("String is : " + ans);
    }
}
```

Q4. Write a Java program to accept an array of n integers and display the smallest and largest?

```
import java.util.*;
public class Main
{
    public static void displayMinMax(int n,int[] arr){
        int min = Integer.MAX_VALUE;
        int max = Integer.MIN_VALUE;

        for(int i=0;i<n;i++){
            if(arr[i]<min){
                min = arr[i];
            }

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

        System.out.println("max is : "+ max);
        System.out.println("min is : "+ min);
    }

    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        System.out.println("Enter size of array");
        int n = scan.nextInt();

        int arr[] = new int[n];
        for(int i=0;i<n;i++){
            arr[i] = scan.nextInt();
        }
        displayMinMax(n,arr);
    }
}
```

Q5. To check whether the number given is perfect or not ?

```
import java.util.*;
public class Main
{
    public static String isPerfect(int n){
        int sum = 0;
        for(int i=1;i<=n/2;i++){
            if(n%i==0)
                sum=sum+i;
        }
        return (sum==n)?"perfect ":"not perfect";
    }
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        System.out.println("Enter a number");
        int n = scan.nextInt();

        String ans = isPerfect(n);
        System.out.println("number is :" + ans);
    }
}
```

Q6. To calculate the sum of First and Last digit of a number ?

```
import java.util.*;
public class Main
{
    //9234
    public static int sumOfFirstLastDigit(int n){
        int ld = n%10;//4
        while(n>9){
            n=n/10;//923-> 92 -> 9
        }
        return ld+n;
    }
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        System.out.println("Enter a number");
        int n = scan.nextInt();

        int ans = sumOfFirstLastDigit(n);
        System.out.println("sum is :" + ans);
    }
}
```

Q7. To check whether given number is prime or not ?

```
import java.util.*;
public class Main
{
    public static String checkPrime(int n){
        for(int i=2;i<=n/2;i++){
            if(n%i==0)
                return "not prime";
        }
        return "prime";
    }
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        System.out.println("Enter a number");
        int n = scan.nextInt();

        String ans = checkPrime(n);
        System.out.println("number is :" + ans);
    }
}
```

Q8. Write a program to find factorial of a number using function?

```
import java.util.*;
public class Main
{
    public static Long fact(int n){
        long fact = 1;
        for(int i=1;i<=n;i++){
            fact = fact*i;
        }
        return fact;
    }
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        System.out.println("Enter a number");
        int n = scan.nextInt();

        Long ans = fact(n);
        System.out.println("factorial is :" + ans);
    }
}
```

Q9. To swap the values of two variables (Without using third variable)?

```
import java.util.*;
public class Main
{
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        System.out.println("Enter 2 number");
        int a = scan.nextInt();
        int b = scan.nextInt();
        System.out.println("a : " + a + " b : " + b);
        a = a+b;
        b = a-b;
        a = a-b;
        System.out.println("a : " + a + " b : " + b);
    }
}
```

Q10. Check weather a number is +ve, 0, or -ve?

```
import java.util.*;
public class Main
{
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        System.out.println("Enter 2 number");
        int n = scan.nextInt();

        if(n<0){
            System.out.println("number is -ve");
        }else if(n==0){
            System.out.println("number is 0");
        }else{
            System.out.println("number is +ve");
        }
    }
}
```

Q11. Write a Java program to print the Fibonacci series up to n terms?

```
import java.util.*;
public class Main
{
    public static void fibbSeries(int n){
        int a = 0;
        int b = 1;
        for(int i=1;i<=n;i++){
            System.out.println(a);
            int c = a+b;
            a = b;
            b = c;
        }
    }
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        System.out.println("Enter 2 number");
        int n = scan.nextInt();
        fibbSeries(n);
    }
}
```

Q12. Write a Java program using Exception Handling to accept a number from the user.If the number is zero, throw a user-defined exception "Number is Zero, otherwise check whether the number is a palindrome or not.

```
import java.util.*;
public class Main
{
    public static String isPalindrome(int n) throws Exception{
        if(n==0)
            throw new Exception("Number is Zero");

        int reverse = 0;
        int tmp = n;//125
        while(tmp!=0){
            int lastdigit = tmp%10;//5,2,1
            reverse = reverse*10 + lastdigit;//5 -> 52 -> 521
            tmp = tmp/10;//12,1,0
        }
        return (reverse==n)?" palindrome. ":" not palindrome.";
    }
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        int n = scan.nextInt();
        try{
            String ans = isPalindrome(n);
            System.out.println("the number is : " +ans);
        }
        catch(Exception e){
            System.out.println("Exception occurred : " + e.getMessage());
        }
    }
}
```

Q13. Write a Java program using method and Exception Handling to accept a number from the user. If the number is greater than 100, throw a user-defined exception "Number is out of Range", otherwise calculate and display the sum of digits of that number?

```
import java.util.Scanner;
public class Main
{
    public static int sumOfDigits(int n) throws Exception{
        if(n>100)
            throw new Exception("Number is out of Range");

        int sum = 0;
        while(n!=0){
            int rem = n%10;
            sum = sum+rem;
            n=n/10;
        }
        return sum;
    }
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        int n = scan.nextInt();
        try{
            int sum = sumOfDigits(n);
            System.out.println("sum is : " + sum);
        }catch(Exception e){
            System.out.println("Exception occurred : " + e.getMessage());
        }
    }
}
```

Q14. Write a Java program using static method and custom exception to accept a number from the user. If the number is negative, throw a custom exception “Negative Number Not Allowed”, otherwise calculate the factorial of the number.

```
import java.util.*;
public class Main
{
    public static int factorial(int n) throws Exception{
        if(n<0)
            throw new Exception("Negative Number Not Allowed");
        int fact = 1;
        for(int i=1;i<=n;i++)
            fact = fact*i;
        return fact;
    }
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        int n = scan.nextInt();
        try{
            int ans = factorial(n);
            System.out.println("the factorial is : " +ans);
        }
        catch(Exception e){
            System.out.println("Exception occurred : " + e.getMessage());
        }
    }
}
```

Q15. Write a Java program using user-defined exception to check whether a number is even or odd. If the number is negative, throw an exception "Negative Number Not Allowed"?

```
import java.util.*;
public class Main
{
    public static String evenOrOdd(int n) throws Exception{
        if(n<0)
            throw new Exception("Negative Number Not Allowed");

        return (n%2==0)? " even": " odd";
    }
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        int n = scan.nextInt();
        try{
            String ans = evenOrOdd(n);
            System.out.println("the number is : " +ans);
        }
        catch(Exception e){
            System.out.println("Exception occurred : " + e.getMessage());
        }
    }
}
```

Q16. Write a Java program using user-defined exception to accept age from the user. If the age is less than 0 or greater than 120, throw an exception "Invalid Age", otherwise display a suitable message?

```
import java.util.*;
public class Main
{
    public static String ageCheck(int n) throws Exception{
        if(n<0 || n>120)
            throw new Exception("Invalid Age");

        return " " + n + " : great feeling alive";
    }
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        int n = scan.nextInt();
        try{
            String ans = ageCheck(n);
            System.out.println("Your age is : " +ans);
        }
        catch(Exception e){
            System.out.println("Exception occurred : " + e.getMessage());
        }
    }
}
```

Q17. Write a Java program using Exception Handling to accept a number from the user. If the number is negative, throw a custom exception "Negative Not Allowed", otherwise calculate the sum of all even digits in the number?

```
import java.util.*;
public class Main
{
    public static int sumOfEvenDigits(int n) throws Exception{
        if(n<0)
            throw new Exception("Negative Not Allowed");

        int sum = 0;
        while(n!=0){
            int rem = n%10;
            if(rem%2==0)
                sum = sum+rem;
            n=n/10;
        }
        return sum;
    }
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        int n = scan.nextInt();
        try{
            int ans = sumOfEvenDigits(n);
            System.out.println("the sum of even digits is : " +ans);
        }
        catch(Exception e){
            System.out.println("Exception occurred : " + e.getMessage());
        }
    }
}
```

Q18. Write a Java program using File Handling to read and display the contents of a text file.

```
import java.io.*;
import java.util.Scanner;
public class File2 {
    Run | Debug
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print(s:"Enter source file name: ");
        String source = sc.nextLine();

        try (FileReader fr = new FileReader(source);
             BufferedReader br = new BufferedReader(fr);
        ) {
            String line;
            while ((line = br.readLine()) != null) {
                System.out.println(line);
            }
            System.out.println(x:"File copied successfully.");
        }
        catch (IOException e) {
            System.out.println("Error: " + e.getMessage());
        }
    }
}
```

Q19. Write a Java program using File Handling to read and display the contents of a text file?

```
import java.io.*;
import java.util.*;
public class File1
{
    Run | Debug
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print(s:"Enter source file name: ");
        String source = sc.nextLine();
        System.out.print(s:"Enter destination file name: ");
        String dest = sc.nextLine();

        try (FileReader fr = new FileReader(source);
            FileWriter fw = new FileWriter(dest);
            BufferedReader br = new BufferedReader(fr);
            BufferedWriter bw = new BufferedWriter(fw)) {
            String line;
            while ((line = br.readLine()) != null) {
                bw.write(line);
                bw.newLine();
            }
            System.out.println(x:"File copied successfully.");
        }
        catch (IOException e) {
            System.out.println("Error: " + e.getMessage());
        }
    }
}
```

Q.20 Write a Java program using inheritance to create a class Book with attributes title and author, and a subclass LibraryBook with shelf number and availability. Display full book details?

```
import java.util.*;
class Book{
    String title;
    String auther;
    Book(String t,String a){
        title = t;
        auther = a;
    }
}
class LibraryBook extends Book{
    int shelfNumber;
    boolean availability;

    LibraryBook(String t,String a,int s,boolean avl){
        super(t,a);
        shelfNumber = s;
        availability = avl;
    }

    void Display(){
        System.out.println("title : "+ title);
        System.out.println("auther : "+ auther);
        System.out.println("shelfNumber : "+ shelfNumber);
        System.out.println("availability : "+ availability);
    }
}
public class Main{
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        System.out.println("enter title,auther,shelfNumber and availability in each line");
        String title = scan.nextLine();
        String auther = scan.nextLine();
        int shelfNumber = scan.nextInt();
        boolean availability = scan.nextBoolean();

        LibraryBook obj = new LibraryBook(title,auther,shelfNumber,availability);
        obj.Display();
    }
}
```

Q21. Write a Java program using interface Greetable having method greet(String name), and implement it in classes MorningGreeting and EveningGreeting to display suitable greetings ?

```
import java.util.*;
interface Greetable{
    public void greet(String name);
}
class MorningGreeting implements Greetable{
    public void greet(String name){
        System.out.println("Good Morning " + name);
    }
}
class EveningGreeting implements Greetable{
    public void greet(String name){
        System.out.println("Good Evening "+ name);
    }
}
public class Main
{
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        String name = scan.nextLine();

        Greetable mg = new MorningGreeting();
        Greetable eg = new EveningGreeting();
        mg.greet(name);
        eg.greet(name);
    }
}
```

Q22. Write a Java program using inheritance to create a class Employee with employee ID and name, and a subclass Salary to compute and display total salary using basic pay and HRA?

```
import java.util.*;
class Employee{
    int employeeId;
    String name;
    Employee(int i, String n){
        employeeId = i;
        name = n;
    }
}
class Salary extends Employee{
    int basicPay;
    int HRA;
    Salary(int id, String name, int bp, int h){
        super(id, name);
        basicPay = bp;
        HRA = h;
    }
    public void displayTotalSalary(){
        System.out.println("name : " + name);
        System.out.println("employeeId : " + employeeId);
        System.out.println("total salary is : " + (basicPay+HRA));
    }
}
public class Main
{
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        System.out.println("Enter empId, name, basicsalary and HRA");
        int id = scan.nextInt();
        String name = scan.nextLine();
        int bs = scan.nextInt();
        int hra = scan.nextInt();
        Salary s = new Salary(id, name, bs, hra);
        s.displayTotalSalary();
    }
}
```

Q23. Design a frame using Swing to perform addition of two numbers?

```
import javax.swing.*;
public class Main {
    Run | Debug
    public static void main(String[] args) {
        JFrame f = new JFrame();
        JTextField t1 = new JTextField(); t1.setBounds(x:50,y:50,width:100,height:20);
        JTextField t2 = new JTextField(); t2.setBounds(x:50,y:80,width:100,height:20);
        JButton b = new JButton(text:"+"); b.setBounds(x:50,y:110,width:100,height:30);
        JLabel l = new JLabel(); l.setBounds(x:50,y:150,width:200,height:20);
        b.addActionListener(e -> {
            int sum = Integer.parseInt(t1.getText()) + Integer.parseInt(t2.getText());
            l.setText("Result: " + sum);
        });
        f.add(t1); f.add(t2); f.add(b); f.add(l);
        f.setSize(width:300,height:300); f.setLayout(manager:null); f.setVisible(b:true);
        f.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    }
}
```