Practical No: 01

write a program to display Hello World message in console window.

Main.java

```java
import java.util.*;
import java.lang.*;

public class Main {
    public static void main(String[] args) {
      System.out.println("Hello, World!");
    }
}
```

STDIN

Input for the program (Optional)

Output:

```
Hello, World!
```

Practical No: 02

Write a program to perform arithmetic and bitwise operations in a single source program without object creation

Arithmetic.java

AI NEW JAVA RUN

```java
import java.util.*;
import java.lang.*;

public class Arithmetic {
    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

        System.out.println("Enter Value For A: ");
        int a = sc.nextInt();

        System.out.println("Enter Value For B: ");
        int b = sc.nextInt();

        int bitWise = a << b;
        int total = a+b;

        System.out.println("Sum Of Two Value: " +total);
        System.out.println("Bits Operation Value: " +bitWise);
    }
}
```

STDIN

```
13
2
```

Output:

```
Enter Value For A:
Enter Value For B:
Sum Of Two Value: 15
Bits Operation Value: 52
```

Practical No: 03

Write a program to perform arithmetic and bitwise operations by creating individual methods and classes than create an object to execute the individual methods of each operation.

Calculate.java

AI NEW JAVA RUN

```java
//program to Calculate addition and bitwise operation using class and objects
import java.util.*;

class Calculate {
    int a,b;

    void getData() {
        Scanner sc = new Scanner(System.in);

        System.out.println("Enter Value For A: ");
        a = sc.nextInt();

        System.out.println("Enter Value For B: ");
        b = sc.nextInt();

    }

    void display() {
        int bitWise = a << b;
        int total = a + b;

        System.out.println("Sum Of Two Value: " + total);
        System.out.println("Bits Operation Value: " + bitWise);
    }

    public static void main(String[] args) {
        Calculate obj = new Calculate();
        obj.getData();
        obj.display();
    }
```

STDIN

```
13
4
```

Output:

```
Enter Value For A:
Enter Value For B:
Sum Of Two Value: 17
Bits Operation Value: 208
```

Practical No: 04

Write a java program to display the employee details using Scanner class.

Employee.java

AI NEW JAVA RUN

```java
//program to create employee details using class and objects:
import java.util.*;

class Employee{
  String name;
  String address;
  float salary;

  void getData(){
  Scanner sc = new Scanner(System.in);
  System.out.println("Enter Your Name: ");
  name = sc.nextLine();
  System.out.println("Enter Your Address: ");
  address = sc.nextLine();
  System.out.println("Enter Your Salary: ");
  salary = sc.nextFloat();
  }

  void display(){
    System.out.println("Your Name: " +name);
    System.out.println("Your Name: " +address);
    System.out.println("Salary: " +salary);
  }
  public static void main (String[] args) {
    Employee obj = new Employee();
    obj.getData();
    obj.display();
  }
}
```

STDIN

```
ABC
Vadodara
15000
```

Output:

```
Enter Your Name:
Enter Your Address:
Enter Your Salary:
Your Name: ABC
Your Name: Vadodara
Salary: 15000.0
```

Practical No: 05

Write a Java program that prints all real solutions to the quadratic equation ax2+bx+c = 0. Read in a, b, c and use the quadratic formula. If the discriminate b2-4ac is negative, display a message stating that there are no real solutions?

QuadraticEquationSolver.java

AI NEW JAVA RUN

```java
import java.util.Scanner;

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

        System.out.println("Enter coefficient for ax^2 + bx + c = 0:");
        System.out.println("a : ");
        double a = sc.nextDouble();
        System.out.println("b : ");
        double b = sc.nextDouble();
        System.out.println("c : ");
        double c = sc.nextDouble();

        double discriminant = b * b - 4 * a * c;

        if (discriminant > 0) {

            double root1 = (-b + Math.sqrt(discriminant)) / (2 * a);
            double root2 = (-b - Math.sqrt(discriminant)) / (2 * a);
            System.out.println("Two distinct real solutions:");
            System.out.println("Root 1 = " + root1);
            System.out.println("Root 2 = " + root2);
        } else if (discriminant == 0) {

            double root = -b / (2 * a);
            System.out.println("One real solution:");
            System.out.println("Root = " + root);
        } else {
            System.out.println("No real solutions exist.");
        }
    }
}
```

STDIN

```
4
5
6
```

Output:

```
Enter coefficient for ax^2 + bx + c = 0:
a :
b :
c :
No real solutions exist.
```

Practical No: 06

The Fibonacci sequence is defined by the following rule. The first 2 values in the sequence are 1, 1. Every subsequent value is the sum of the 2 values preceding it. Write a Java program that uses both recursive and non- recursive functions to print the nth value of the Fibonacci sequence

Main.java

```java
import java.util.*;

public class Main {
    public static void main(String[] args) {
        int n1 = 1, n2 = 1, n3 = 0, position;
        Scanner sc = new Scanner(System.in);

        System.out.println("Enter Position: ");
        position = sc.nextInt();

        System.out.print(n1 + " ");

        for (int i = 1; i < position; i++) {
            System.out.print(n2 + " ");
            n3 = n1 + n2;
            n1 = n2;
            n2 = n3;
        }
    }
}
```

STDIN

```
10
```

Output:

```
Enter Position:
1 1 2 3 5 8 13 21 34 55
```

Practical No: 06 (using recursion)

FibonacciRecursive.java

AI NEW JAVA RUN

```java
import java.util.Scanner;

public class FibonacciRecursive {

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);
        System.out.println("Enter Number:");
        int n = sc.nextInt();

        System.out.println("Fibonacci Series:");
        for (int i = 0; i < n; i++) {
            System.out.print(fibonacci(i) + " ");
        }
    }

    public static int fibonacci(int n) {
        if (n <= 1) {
            return n;
        } else {
            return fibonacci(n - 1) + fibonacci(n - 2);
        }
    }
}
```

STDIN

```
10
```

Output:

```
Enter Number:
Fibonacci Series:
0 1 1 2 3 5 8 13 21 34
```

Practical 10

Write a java program for Method overloading and Constructor overloading

Student.java + Bharat5inh NEW JAVA RUN

```java
public class Student {
    int id;
    String name;

    Student() {
        System.out.println("this a default constructor");
    }

    Student(int i, String n) {
        id = i;
        name = n;
    }

    public static void main(String[] args) {
        Student s = new Student();
        System.out.println("\nDefault Constructor values: \n");
        System.out.println("Student Id : " + s.id + "\nStudent Name : " + s.name);

        System.out.println("\nParameterized Constructor values: \n");
        Student student = new Student(10, "David");
        System.out.println("Student Id : " + student.id + "\nStudent Name : " + student.name);
    }
}

// OR:

/*public static void main(String[] args) {
    Student s = new Student();
    Student(10, "smita");
}}*/
```

STDIN

Input for the program (Optional)

Output:

```
this a default constructor

Default Constructor values:

Student Id : 0
Student Name : null

Parameterized Constructor values:

Student Id : 10
Student Name : David
```