🧱 1. Introduction to Java Program Structure

```
public class Test {
      public static void main(String[] args) {
            System.out.println("Hello Akarsh");
            System.out.print("Bye Akarsh");
      }

}
```

Concept:

- Every Java program starts execution from the `main()` method.
- `System.out.println()` prints text followed by a new line.
- `System.out.print()` prints text on the same line.

📦 2. Variables and Data Basics

```
public class VariableDemo {
    public static void main(String[] args) {
        int a = 8;
        System.out.println(a);
    }

}
```

Concept:

- Variables store data temporarily.
- Each variable has a type (`int`, `float`, `String`, etc.).
- Naming conventions: must begin with a letter, $, or `_`, and cannot use reserved keywords.

➗ 3. Java Operators Overview

Java divides operators into groups:

1. Arithmetic Operators
2. Assignment Operators
3. Comparison Operators
4. Logical Operators
5. Bitwise Operators

🔹 Arithmetic Operators

Arithmetic operators are used to perform common mathematical operations.

Operator	Name	Description	Example
+	Addition	Adds together two values	x + y
-	Subtraction	Subtracts one value from another	x - y

*	Multiplication	Multiplies two values	x * y
/	Division	Divides one value by another	x / y
%	Modulus	Returns the division remainder	x % y
++	Increment	Increases the value of a variable by 1	++x
--	Decrement	Decreases the value of a variable by 1	--x

```java
public class ArithmeticOperators {
    public static void main(String[] args) {
        int a = 7, b = 2;

        System.out.println(a + b);
        System.out.println(a - b);
        System.out.println(a * b);
        System.out.println(a / b);
        System.out.println(a % b);
    }

}
```

Assignment Operators

Assignment operators are used to assign values to variables.

In the example below, we use the assignment operator (=) to assign the value 10 to a variable called x:

```java
int x = 10;
```

The addition assignment operator (+=) adds a value to a variable:

```java
int x = 10;
x += 5;
```

Operator	Example	Same As
=	x = 5	x = 5
+=	x += 3	x = x + 3
-=	x -= 3	x = x - 3
*=	x *= 3	x = x * 3
/=	x /= 3	x = x / 3
%=	x %= 3	x = x % 3
&=	x &= 3	x = x & 3
|=	x |= 3	x = x | 3

^=	x ^= 3	x = x ^ 3
>>=	x >>= 3	x = x >> 3
<<=	x <<= 3	x = x << 3

Note: Most assignment operators are just shorter ways of writing code. For example, x += 5 is the same as x = x + 5, but shorter and often easier to read.

```
public class AssignmentOperators {
      public static void main(String[] args) {
            int x = 5;
            x %= 2;// x = x%2;
            System.out.println(x);
      }

}
```

🔹 Increment / Decrement Example

```
public class IncDec {
      public static void main(String[] args) {
            int x = 8;
////        x++; // x = x+1;
////        x--; // x=x-1;
////        ++x; // x = x+1;
////        --x; // x=x-1;
//          System.out.println(x++);
//          System.out.println(x);
//          int y = 19;
//          System.out.println(--y);
//          System.out.println(y);
            int c = x++ - ++x + --x + x-- - --x + --x;
            System.out.println(c);

      }

}
```

Concept:

- x++ → Post-increment (use then increment)
- ++x → Pre-increment (increment then use)

⚖️ 4. Comparison & Logical Operators

Comparison Operator	Name	Example
==	Equal to	x == y
!=	Not equal	x != y

>	Greater than	x > y
<	Less than	x < y
>=	Greater or equal	x >= y
<=	Less or equal	x <= y