# Java Assignments – Day 3

Topics Covered:  
- JDK, JRE, JVM  
- Keywords  
- Variables and Data Types  
- Input/Output  
- Operators: Assignment, Arithmetic, Relational, Logical, Increment/Decrement, Ternary, Bitwise (&, |, <<, >>)

## Assignment 1: Basic Data Type and Range Checker

Question:  
Take input from the user for the following data types:  
- byte  
- short  
- int  
- long  
- float  
- double  
Print their values and also print the minimum and maximum range of each data type using wrapper classes (e.g., Byte.MIN\_VALUE, Byte.MAX\_VALUE).

Input Format:  
12  
32000  
123456789  
9876543210  
3.14  
12345.6789

Output Format:  
Byte: 12, Range: -128 to 127  
Short: 32000, Range: -32768 to 32767  
Int: 123456789, Range: -2147483648 to 2147483647  
Long: 9876543210, Range: -9223372036854775808 to 9223372036854775807  
Float: 3.14, Range: 1.4E-45 to 3.4028235E38  
Double: 12345.6789, Range: 4.9E-324 to 1.7976931348623157E308

## Assignment 2: Operator Evaluation

Question:  
Take two integers as input and perform the following operations:  
- Addition, Subtraction, Multiplication, Division, Modulus  
- Greater than, Less than, Equal to  
- Logical AND, OR, NOT  
- Bitwise AND (&), OR (|), Left Shift (<<), Right Shift (>>)  
Print the result of each operation.

Input Format:  
10  
5

Output Format:  
Addition: 15  
Subtraction: 5  
Multiplication: 50  
Division: 2  
Modulus: 0  
Greater than: true  
Less than: false  
Equal to: false  
Logical AND (a>5 && b<10): true  
Logical OR (a>10 || b<10): true  
Bitwise AND: 0  
Bitwise OR: 15  
Left Shift (a << 1): 20  
Right Shift (a >> 1): 5

## Assignment 3: Ternary Operator Practice

Question:  
Take an integer input from the user. Use the ternary operator to check whether the number is even or odd. Print the result.

Input Format:  
7

Output Format:  
The number 7 is Odd

## Assignment 4: Pre/Post Increment-Decrement Check

Question:  
Take an integer input from the user. Show the difference between:  
- Pre-increment (++a)  
- Post-increment (a++)  
- Pre-decrement (--a)  
- Post-decrement (a--)  
Print the value at each step.

Input Format:  
5

Output Format:  
Original: 5  
Pre-Increment: 6  
Post-Increment: 6 (printed), then becomes 7  
Pre-Decrement: 6  
Post-Decrement: 6 (printed), then becomes 5

## Assignment 5: Swap Two Numbers Without Third Variable

Question:  
Take two integers as input from the user. Swap their values using arithmetic operators (+ and -) without using a third variable. Print the values before and after swapping.

Input Format:  
a = 10  
b = 20

Output Format:  
Before Swap: a = 10, b = 20  
After Swap: a = 20, b = 10

## Assignment 6: Bitwise XOR Swap

Question:  
Take two integers and swap them using bitwise XOR ( ^ ) operator without using a third variable. Print the values before and after swapping.

Input Format:  
a = 5  
b = 7

Output Format:  
Before Swap: a = 5, b = 7  
After Swap: a = 7, b = 5

## Assignment 7: Temperature Conversion

Question:  
Take temperature in Celsius as input and convert it to Fahrenheit using the formula: F = (C × 9/5) + 32

Input Format:  
Celsius = 37

Output Format:  
Fahrenheit: 98.6

## Assignment 8: Area and Perimeter of a Rectangle

Question:  
Take length and breadth as input and calculate:  
- Area = length × breadth  
- Perimeter = 2 × (length + breadth)

Input Format:  
Length = 10  
Breadth = 5

Output Format:  
Area: 50  
Perimeter: 30