Introduction & Basics

DAY - 2 (17-07-25)

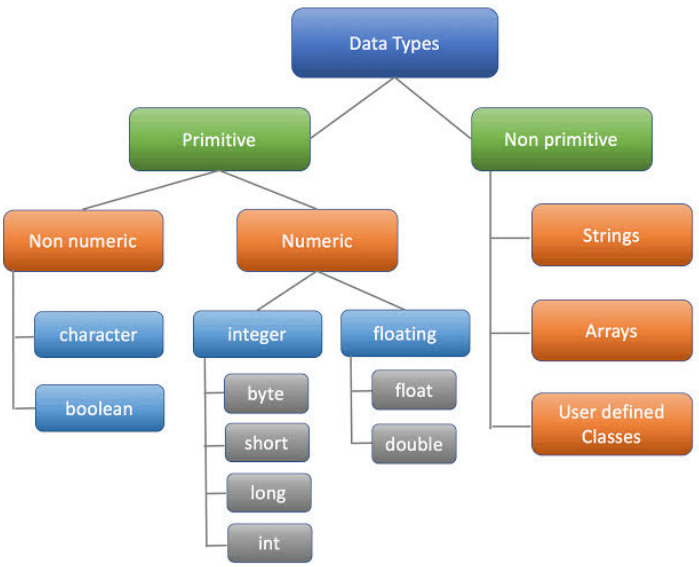
Topics Discussed:

- Scope
- Variables
- Data Types
- Operators
- Arrays
- Strings

SESSION - 1

Data Types in Java

Java is a statically-typed language, which means that the data type of a variable is known at compile time.
Java has two main categories of data types:



Primitive Data Types:

These are the basic data types

that are built into the Java language. They include:

Integer Types:

- byte (8-bit signed integer)
- short (16-bit signed integer)
- int (32-bit signed integer)
- long (64-bit signed integer)

Floating-Point Types:

- float (32-bit floating-point number)
- double (64-bit floating-point number)

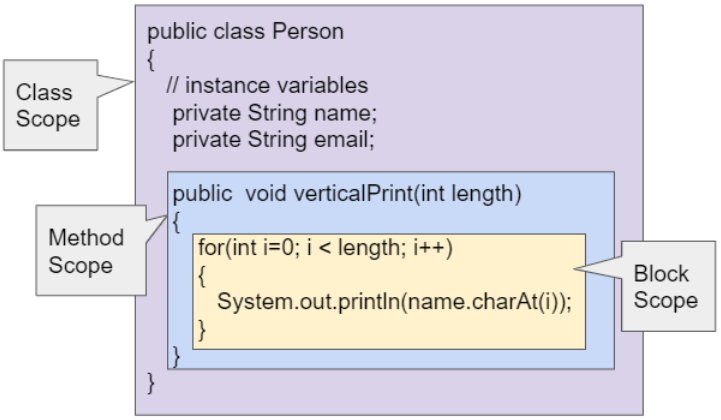
Boolean Type:

- boolean (true or false)

Character Type:

- char (16-bit unsigned integer representing a single character)

Reference Data Types:



These are data types that are not primitive, but are instead references to objects. They include:

Classes: A class is a blueprint for creating objects.

Interfaces: An interface is a collection of abstract methods.

Arrays: An array is a collection of values of the same data type stored in contiguous memory locations.

Strings: A string is a sequence of characters.

Variables in Java

A variable is a name given to a memory location that stores a value. In Java, variables can be declared and initialized in several ways:

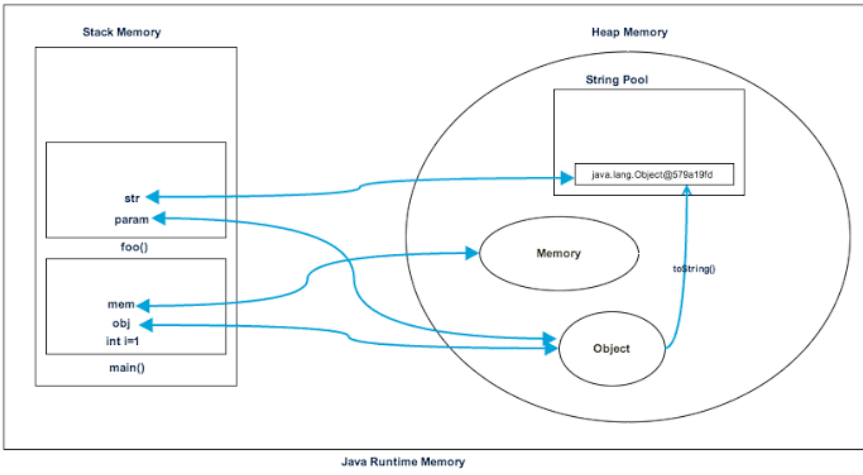
Declaration: A variable declaration specifies the data type and name of the variable. For example: `int x;`

Initialization: A variable can be initialized with a value when it is declared. For example: `int x = 10;`

Types of Variables:

Local Variables:
These are variables that are declared within a method or block. They are only accessible within that scope.

Instance Variables:
These are variables that are declared within a class, but outside any method or block. They are associated with instances of the class.



Static Variables:

These are variables that are
declared with the static keyword.
They are shared by all instances
of the class.

Operators in Java:

Arithmetic Operators

These operators are used to perform basic mathematical operations.

You use them when you want to:

Add numbers

Subtract numbers

Multiply numbers

Divide numbers

Find the remainder after division

These are useful in calculations and formulas.

Relational Operators

Also known as comparison . operators, they are used to compare two values.

You use them when you want to check:

If two values are equal

If one value is greater than the other

If one value is less than the other

If two values are not equal

If a value is greater than or equal to another

If a value is less than or equal to another

Logical Operators

Logical operators are used to combine two or more conditions.

Both conditions must be true

At least one condition must be true

Assignment Operators

Assignment operators are used to assign values to variables.

They help you to:

Store a value in a variable

Increase or decrease the value of a variable

Do calculations and store the result back in the same variable

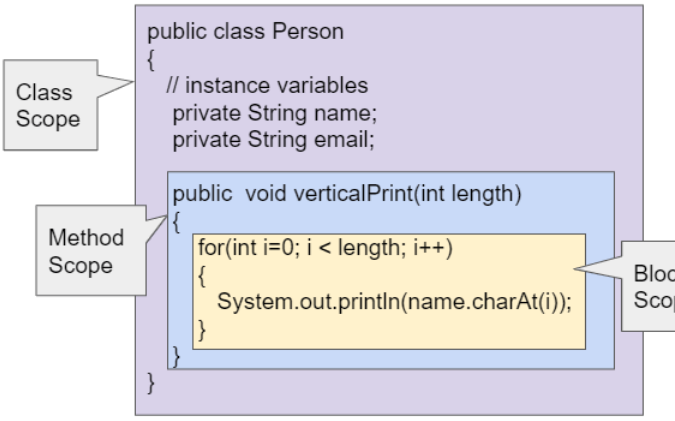
Unary Operators

Unary operators work with a single value or variable.

They are used to:

Increase or decrease a value by one

Change the sign of a number



Scope in Java

Scope refers to the part of the program where a variable is accessible.

Local Scope:

A variable declared inside a method or block.

It is available only within that method or block

Instance Scope

A variable declared inside a class but outside methods.

Static Scope

A variable declared with the static keyword.

It is shared among all objects of the class.

It is loaded when the class is loaded and exists until the class is unloaded.

Arrays in Java

An array is a data structure that stores multiple values of the same type in a single variable.

Each item in the array is called an element.

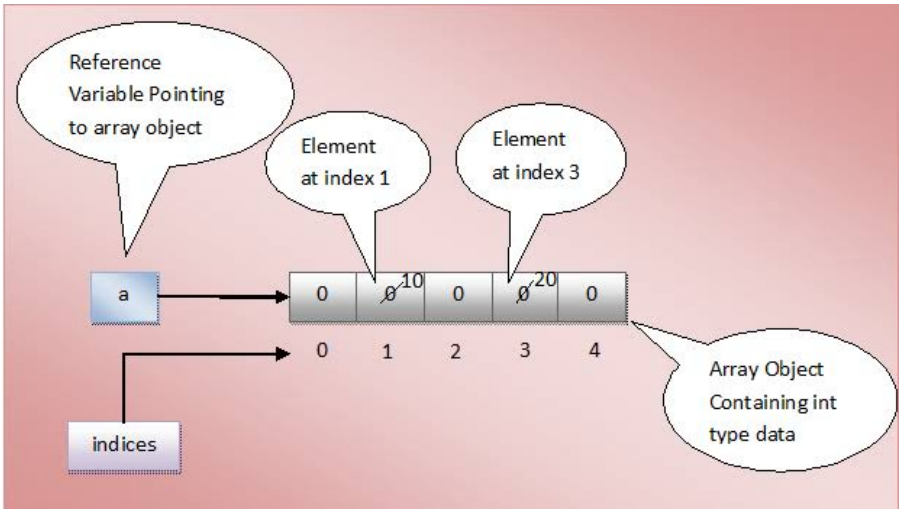
Every element is identified by an index that starts from zero.

Arrays are useful when you want to store a list of values like marks, names, or prices.

Types of Arrays

One-Dimensional Array

A simple list of items.
Like a row of data.



Two-Dimensional Array
Like a table with rows and

Useful for things like matrices, . boards, or seating

Features

Arrays are fixed in size once created.

They can hold primitive types (like numbers) or objects (like

strings).

Strings in Java

A String is a sequence of characters used to represent text. In Java, strings are objects.

Characteristics

A string can contain letters, digits, symbols, or spaces.

Once created, a string cannot be changed. If you try to change it, Java creates a new one.

Ways to Create Strings

1. Using double quotes

Example: “Hello”

2. Using the String class

Java treats both as objects behind the scenes.

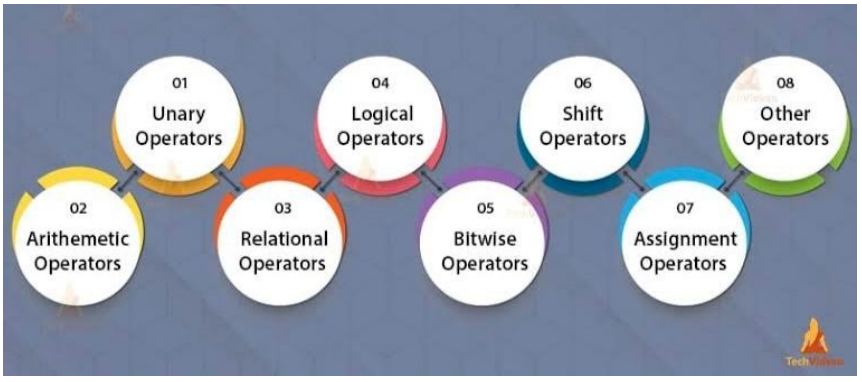
Common String Operations.

Check the length of a string.

Combine strings together.

Get a part of the string.

Compare two strings.



Convert case (uppercase or lowercase).

Remove spaces or trim the string.

Special Property

Java uses a String Pool, which is a special memory area to store strings efficiently.

It saves memory by storing only one copy of identical strings.