Title: Introduction to Java Basics and Data Types

Subtitle: A Comprehensive Guide for Beginners

Name: Rama Shanker

Date: 21/01/2025

What is Java?

Definition

Java is a high-level, object-oriented programming language.

Designed for platform independence: "Write Once, Run Anywhere."

Key Features

Simple and easy to learn.

Secure and robust.

Portable and platform-independent.

Multi-threaded and dynamic.

Why Learn Java?

Applications of Java

Android app development.

Web applications.

Enterprise software.

Embedded systems.

Benefits

Strong community support.

Extensive libraries and frameworks.

High demand in the industry.

Java Development Environment

Components

JDK (Java Development Kit): Contains tools for development.

JRE (Java Runtime Environment): Enables execution of Java programs.

JVM (Java Virtual Machine): Converts bytecode to machine code.

Setup Steps

Download and install JDK.

Set the PATH environment variable.

Use an IDE like IntelliJ IDEA, Eclipse, or NetBeans.

Basic Syntax of Java

Example Program

```
public class HelloWorld {
      int a=10;
      int b=20
      char =’a’
    public static void main(String[] args) {
        System.out.println("Hello, World!");
    }
}

HelloWorld hello= new HelloWorld();
```

Explanation

public class HelloWorld: Declares a class.

public static void main(String[] args): Entry point of the program.

System.out.println: Prints output to the console.

010110

Java Data Types

Categories of Data Types

Primitive Data Types:

Basic building blocks.

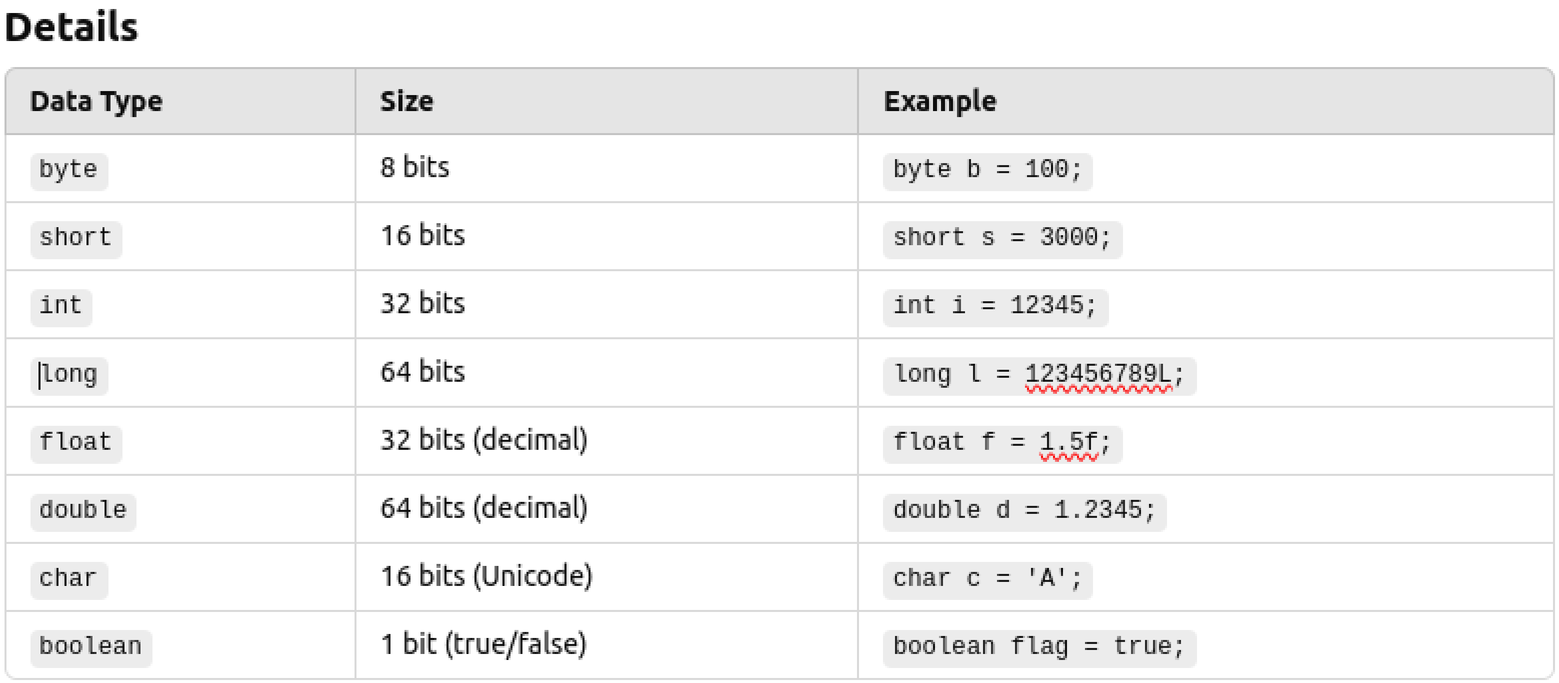
Examples: int, float, char, boolean.

Non-Primitive Data Types:

Objects and arrays.

Examples: Strings, Arrays, Classes.

Primitive Data Types



Details

Data Type	Size	Example
`byte`	8 bits	`byte b = 100;`
`short`	16 bits	`short s = 3000;`
`int`	32 bits	`int i = 12345;`
`long`	64 bits	`long l = 123456789L;`
`float`	32 bits (decimal)	`float f = 1.5f;`
`double`	64 bits (decimal)	`double d = 1.2345;`
`char`	16 bits (Unicode)	`char c = 'A';`
`boolean`	1 bit (true/false)	`boolean flag = true;`

Non-Primitive Data Types

Examples

String: A sequence of characters.

```
String name = "Java";
```

Array: Collection of elements of the same type.

```
int[] numbers = {1, 2, 3, 4, 5};
```

Class and Objects: Custom types created by the user.

```
class Car {
    String brand;
    int speed;
      int wheels=4
      String VIN

}
Car myCar= new Car()
```

Data Type Conversion

Automatic (Widening)

Converts smaller types to larger types.

Example:

```
int num = 10;
double d = num; // int to double
```

Explicit (Narrowing)

Converts larger types to smaller types.

Example:

```
double d = 10.5;

int num = (int) d; // double to int
```

Summary

Java Basics:

Platform-independent and widely used.

Clear syntax and powerful features.

Data Types:

Primitive and Non-Primitive.

Integral, floating-point, character, and boolean.

Practice Tips:

Write and debug simple programs.

Explore data types in depth.