# Lecture#1 – Java Basics

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This document serves as a summarized and visualized mind map for the first lecture in Java and Android Development, focusing on the fundamental concepts of Java. It covers essential topics such as the introduction to Java, setting up the development environment, Java basics, operators, control flow, object-oriented programming, sample code references, and variable naming rules. The structured format aims to enhance understanding and retention of the material.

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## 🧩 1 . Introduction to Java

- **What is Java?**
    - A high-level, object-oriented programming language.
- **Features of Java**
    - Platform-independent, robust, secure, and multi-threaded.
- **Why it's used for Android Development**
    - Native support, extensive libraries, and large community.

Exploring Java's Core Aspects



Android Development Use

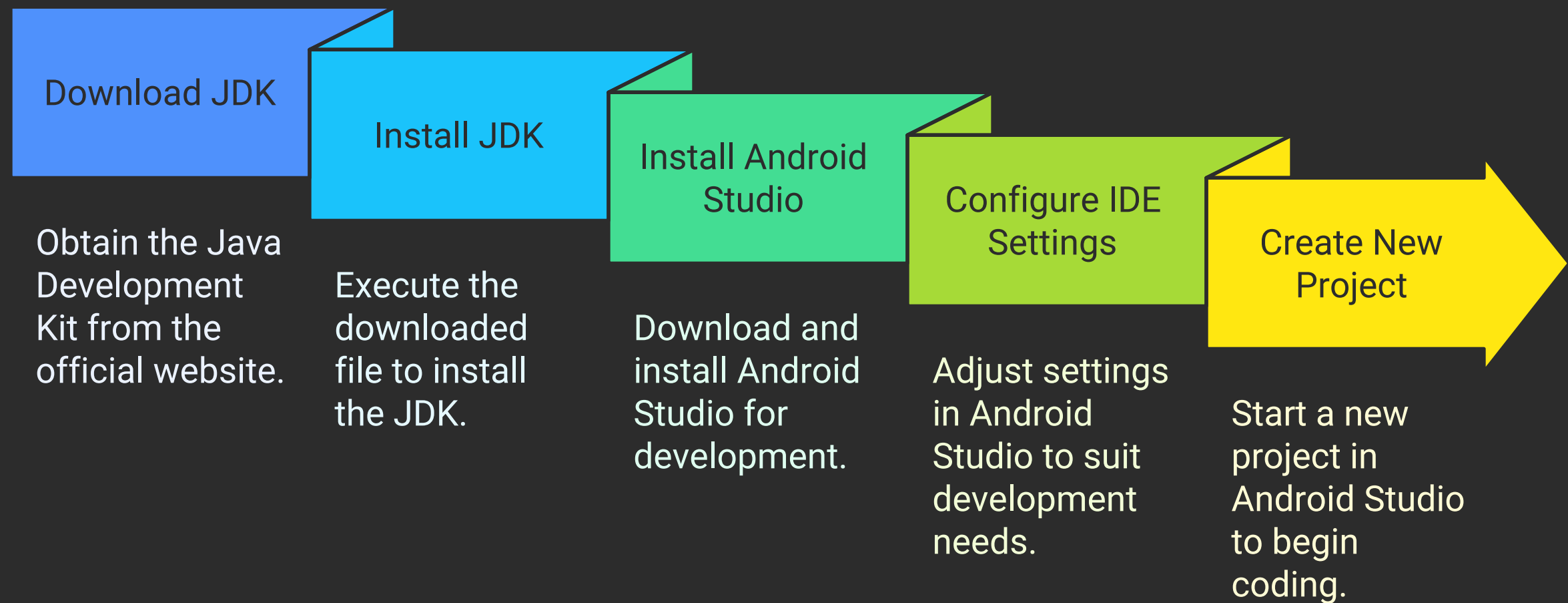Definition

Features

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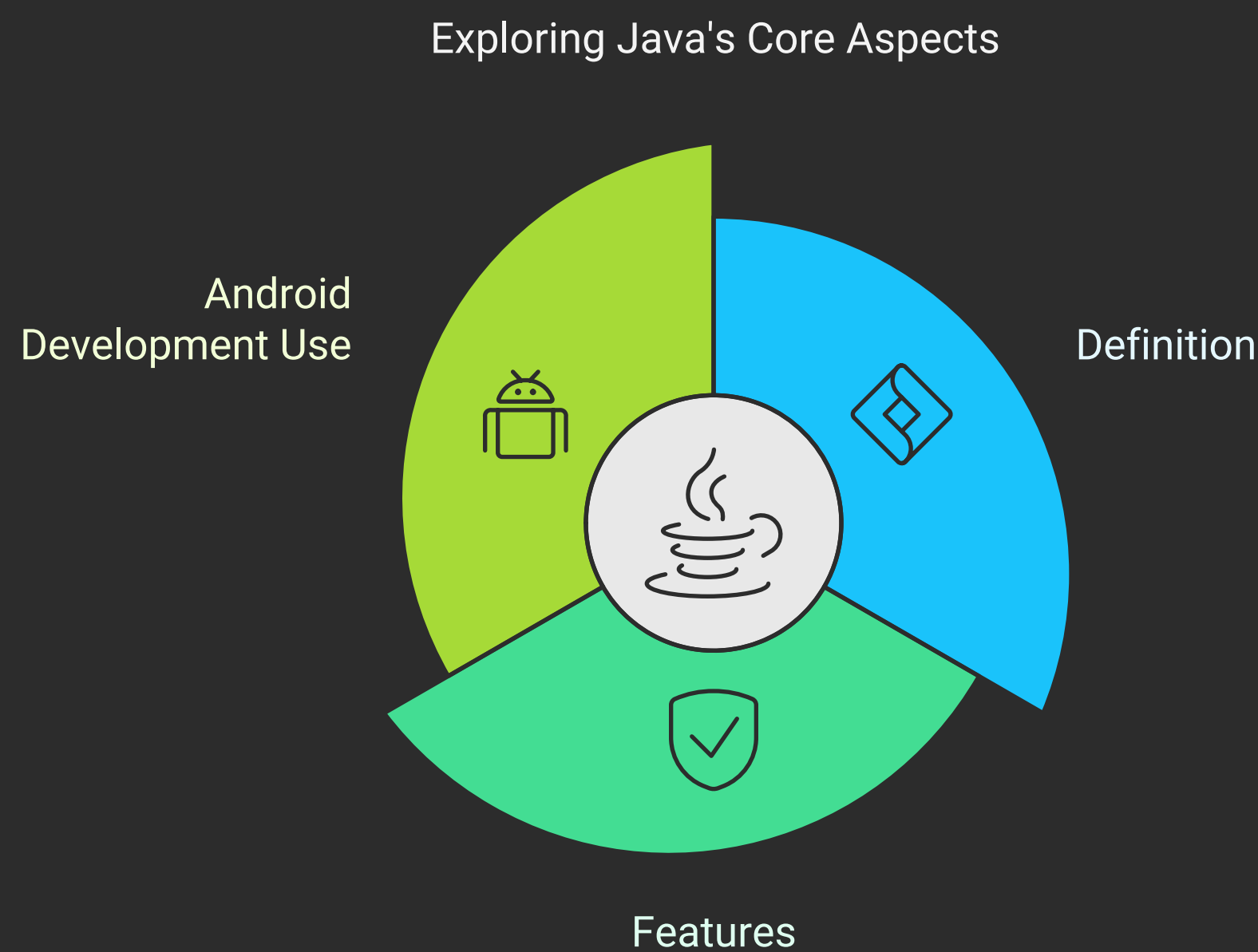
## ⚙️‼️ 2 . Setting Up Development Environment

- **Installing JDK and Android Studio**
    - Download and install JDK.

- Install Android Studio.
- **Basic setup workflow**
  - Configure IDE settings.
  - Create a new project.

**Setting Up Java Development Environment**

**Download JDK**

Obtain the Java Development Kit from the official website.

**Install JDK**

Execute the downloaded file to install the JDK.

**Install Android Studio**

Download and install Android Studio for development.

**Configure IDE Settings**

Adjust settings in Android Studio to suit development needs.

**Create New Project**

Start a new project in Android Studio to begin coding.

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## 📝 3 . Java Basics

- **Variables and Naming Rules**
  - Must start with a letter, no spaces.
- **Data Types**
  - **Primitive Types:**
    - **byte**, **short**, **char**, **int**, **long**, **float**, **double**
- **Typecasting**
  - **Implicit (Widening Conversion)**
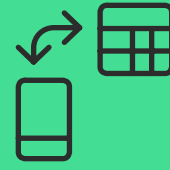  - **Explicit (Narrowing Conversion)**

## Variables and Naming

Rules for naming variables in programming.

V/A
←

## Typecasting

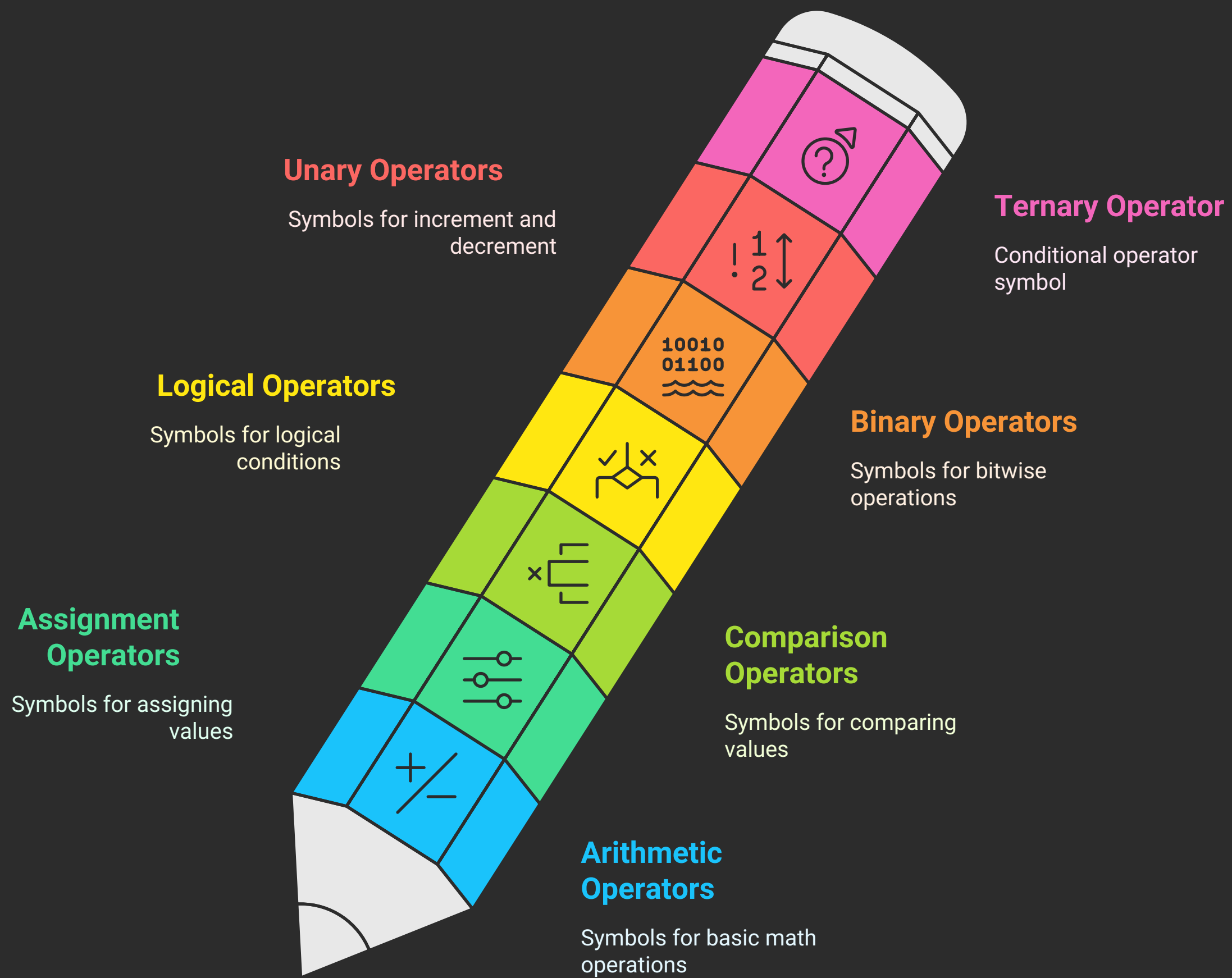Converting one data type into another type.

## Data Types

Fundamental data types like byte, int, float.

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**+** 4 . Java Operators

- **Arithmetic Operators: +, -, *, /, %**
- **Assignment Operators: =, +=, -=,** etc.
- **Comparison Operators: >, <, ==, !=,** etc.
- **Logical Operators: &&, ||, !**
- **Binary Operators: &, |, ^**
- **Unary Operators: ++, --**
- **Ternary Operator: condition ? true : false**

# Overview of Java Operators

**Unary Operators**

Symbols for increment and decrement

**Ternary Operator**

Conditional operator symbol

**Logical Operators**

Symbols for logical conditions

**Binary Operators**

Symbols for bitwise operations

**Assignment Operators**

Symbols for assigning values

**Comparison Operators**

Symbols for comparing values

**Arithmetic Operators**

Symbols for basic math operations

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## 5. Control Flow

- **Loops**
  - **for, while, do-while**
- **Arrays**
  - **1D and 2D Arrays**
  - Declaration and initialization
- **Functions/Methods**
  - Syntax and usage
  - Return types and parameters

## Comparison of Programming Concepts

|  | Loops | Arrays | Functions/Methods |
|---|---|---|---|
| **Types** | `for`, `while`, `do-while` | 1D and 2D | Syntax and usage |
| **Declaration** | N/A | Declaration and initialization | Return types and parameters |

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# 🧱 6. Object-Oriented Programming (OOP) Basics

- **Classes and Objects**
- **Attributes and Methods**
- **Constructors**
- **Encapsulation**
  - Private fields + getters/setters

## OOP Concepts

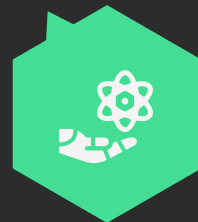**Encapsulation**

Bundling data with methods

**Classes and Objects**

Blueprint for creating instances

**Constructors**

Special methods for object creation

**Attributes and Methods**

Data and behavior within objects

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# 📂 7 . Sample Code Reference

- **HelloWorld.java** – Basic structure
- **VariableRules.java** – Naming conventions
- **DataTypes.java** – Data types in practice
- **Typecasting.java** – Examples of type conversion
- **Operators.java** – All operator types
- **Loops.java** – Loop examples
- **Arrays.java** – 1D and 2D arrays
- **Functions.java** – Java method creation
- **OOPConcepts.java** – Full class + object structure

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# ✍️‼️ 8 . Variable Naming Rules

- Use A–Z, a–z, 0–9 (not as first character)
- No spaces (use _ instead)
- Can use **$**
- Meaningful and descriptive names recommended

## Naming Conventions

### Allowed Characters
Use letters, numbers, and dollar signs. Numbers cannot be the first character.

### Dollar Sign
The dollar sign is allowed in names.

### Spaces
Spaces are not allowed, use underscores instead.

### Name Quality
Meaningful and descriptive names are recommended for clarity.