1. **Introduction to Java**

Java is a high-level, class-based, object-oriented programming language developed by Sun Microsystems (now owned by Oracle) in 1995.  
It is known for its platform independence, meaning you can write a program once and run it anywhere that has a Java Virtual Machine (JVM).

🔸 What makes Java popular:

* Easy to learn
* Object-oriented
* Secure and robust
* Large community support

1. **Features of Java**

Java is packed with powerful features. Here are the most important ones:

| Feature | Description |
| --- | --- |
| Simple | Easy syntax, similar to C/C++, but with fewer complexities. |
| Object-Oriented | Everything in Java is treated as an object. |
| Platform Independent | Bytecode can run on any system with JVM. |
| Secure | Provides runtime checking, no pointer use, and supports security features. |
| Robust | Strong memory management and exception handling. |
| Multithreaded | Can perform multiple tasks at once using threads. |
| Portable | Code can be moved across platforms easily. |
| High Performance | Just-In-Time (JIT) compiler improves performance. |

**3. Structure of a Java Program:**

A basic Java program consists of the following components:

1. Package Declaration (optional)

2. Import Statements

3. Class Declaration

4. main() Method

5. Statements and Expressions

**Example:**

public class HelloWorld {

public static void main(String[] args)

{

System.out.println("Hello, World!");

}

}

**main() Method:**

The main() method is the entry point of any Java application. It has this signature:

public static void main(String[] args)

- public: Accessible from anywhere.

- static: Can be run without creating an instance of the class.

- void: Does not return any value.

- String[] args: Accepts command-line arguments.

How Java Code Runs (Compile -> Bytecode -> JVM):

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1. Write Code: You write Java code in .java files.

2. Compile: The Java Compiler (javac) compiles .java files into .class files (Bytecode).

3. JVM: The Java Virtual Machine (JVM) interprets or compiles the Bytecode and runs it on the host machine.

Java Code (.java)

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Compiler (javac)

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Bytecode (.class)

↓

JVM

↓

Machine Code (Run on system)

**4.Keywords**

**Java has 50 reserved keywords**. Some commonly used ones are:

- **class**: Declares a class.

- **public**: Access modifier making code accessible from other classes.

- **static**: Belongs to the class, not instances.

- **void**: Indicates no return value.

- **int, float, char, boolean**: Primitive data types.

- **if, else, switch, case**: Conditional control.

- **for, while, do**: Loop control.

- **try, catch, finally, throw, throws**: Exception handling.

- **import**: Brings other packages or classes into the file.

- **return**: Exits from a method and optionally returns a value.

These keywords have special meaning and cannot be used as identifiers.