**Introduction to Java**

**Java** is a high-level, object-oriented programming language introduced by Sun Microsystems in 1995 and now owned by Oracle. It is widely used to develop web, mobile, and enterprise applications.

**Key Characteristics:**

* **Platform-independent**: Java's "Write Once, Run Anywhere" (WORA) ensures programs run on any JVM-enabled device.
* **Object-Oriented**: Core principles include classes, objects, inheritance, and polymorphism.
* **Secure and Robust**: Features like exception handling and strong memory management enhance reliability and security.

**Features of Java**

1. **Simple**: Easy to learn and understand.
2. **Platform-independent**: Java bytecode runs on any system with a JVM.
3. **Object-Oriented**: Implements real-world concepts using classes and objects.
4. **Robust**: Supports exception handling and memory management.
5. **Secure**: Prevents unauthorized data access.
6. **Multithreaded**: Handles concurrent tasks effectively.
7. **High Performance**: Uses Just-In-Time (JIT) compiler for optimized execution.

**Installing JDK and Setting Up the Environment**

1. **Download JDK**:
   * Visit Oracle's official site or OpenJDK and download the latest version for your OS.
2. **Install JDK**:
   * Run the installer and follow setup instructions.
3. **Set Environment Variables**:
   * **Windows**: Update PATH in System Properties → Advanced → Environment Variables.
   * **macOS/Linux**: Add to .bashrc or .zshrc:

bash

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export PATH=/path/to/jdk/bin:$PATH

1. **Verify Installation**:
   * Run java -version in a terminal or command prompt to confirm successful setup.

**Writing Your First Java Program (HelloWorld)**

**Code Example**:

public class HelloWorld {

public static void main(String[] args) {

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

}

}

**Steps**:

1. Save the file as HelloWorld.java.
2. Compile with:

bash

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javac HelloWorld.java

1. Run the program:

bash

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java HelloWorld

**Output**:  
Hello, World!

**Java Program Structure**

**Template**:

// This is a comment

public class ClassName {

public static void main(String[] args) {

System.out.println("Your message"); // Code to be executed

}

}

**Explanation:**

* **public class ClassName**: Declares a class.
* **public static void main(String[] args)**: Entry point of the program.
* **System.out.println**: Prints output to the console.

**Comments in Java**

Comments improve readability and explain code logic.

**Types of Comments:**

1. **Single-line**:

// Single-line comment

1. **Multi-line**:

/\* Multi-line comment

for detailed explanations \*/

1. **Documentation**:

/\*\*

\* This is a documentation comment.

\* Used to generate documentation via javadoc.

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