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Compilation & Execution

1. Write code in `.java` files.
2. Compile: `javac MyProgram.java` → `.class` (bytecode).
3. Run: `java MyProgram`.

Data Types and Variables

- **Primitive Types**: `int`, `float`, `char`, `boolean`, etc.
- **Example**:

```
int num = 10; char letter = 'A';
```

Operators

- Arithmetic: `+`, `-`, `*`, `/`, `%`.
- Relational: `>`, `<`, `==`.
- Logical: `&&`, `||`, `!`.

Control Statements

- **Conditionals**: `if`, `else if`, `else`.
- **Loops**:

```
for (int i = 0; i < 3; i++) {
        System.out.println(i);
}
```

Object-Oriented Programming (OOP)

- **Principles**:
    - **Encapsulation**, **Inheritance**, **Polymorphism**, **Abstraction**.
- Example:

```
class Car {
String model;
```

```java
int year;
void displayInfo() {
        System.out.println(model + " - " + year);
}
}
Car myCar = new Car();
myCar.model = "Toyota";
myCar.year = 2022;
myCar.displayInfo();
```

Common Libraries

- `java.util` (collections, utilities).
- `java.io` (file I/O).
- Example:

```java
import java.util.Scanner;
Scanner sc = new Scanner(System.in);
int age = sc.nextInt();
```

Benefits of Java

- Portable, secure, vast libraries, and automatic memory management (Garbage Collection).