Intro to Java

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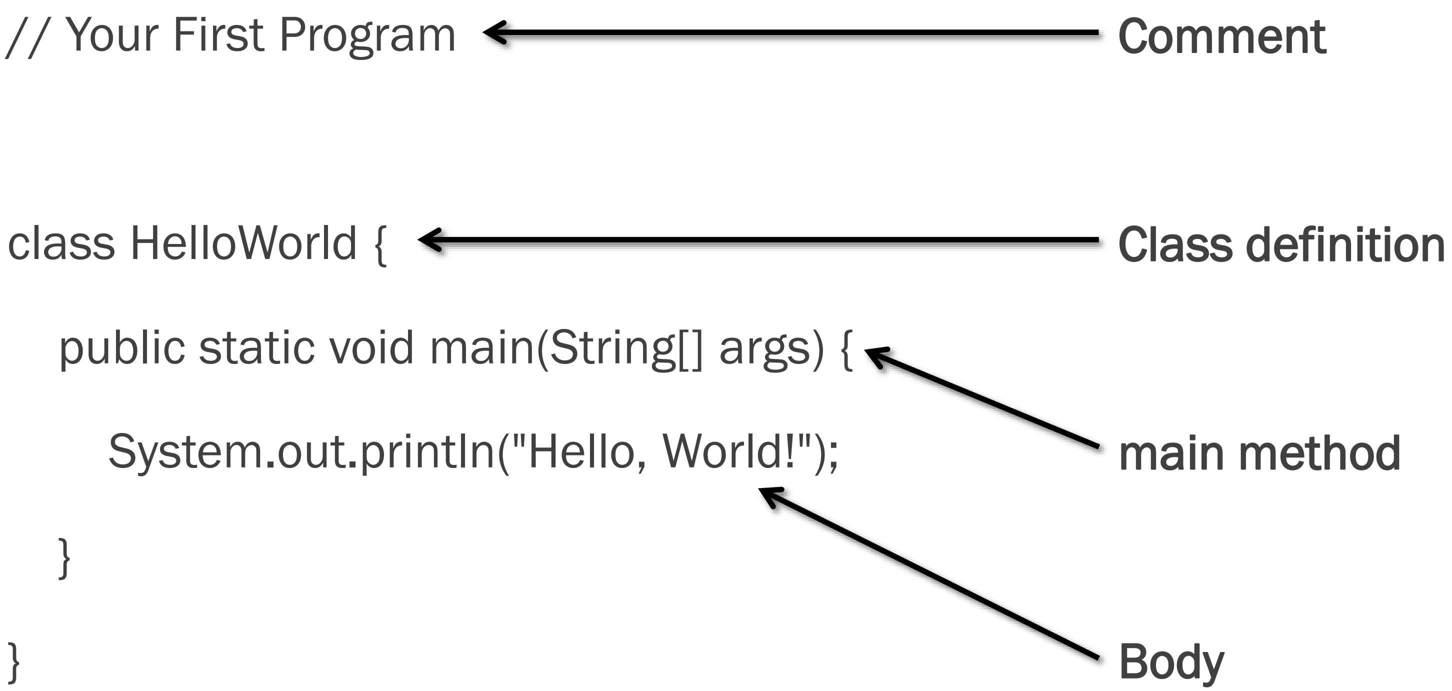
Java Hello World Program



```
// Your First Program


class HelloWorld {
    public static void main(String[] args) {
        System.out.println("Hello, World!");
    }
}
```

Comment

Class definition

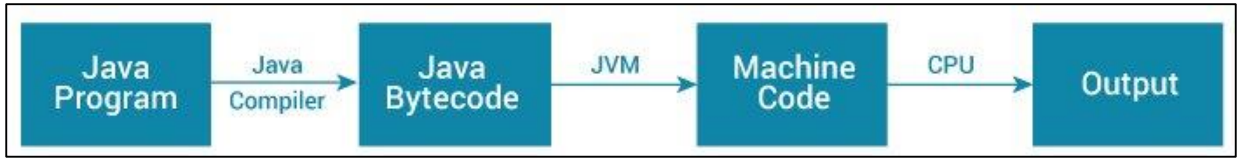
main method

Body

Java JDK, JRE and JVM

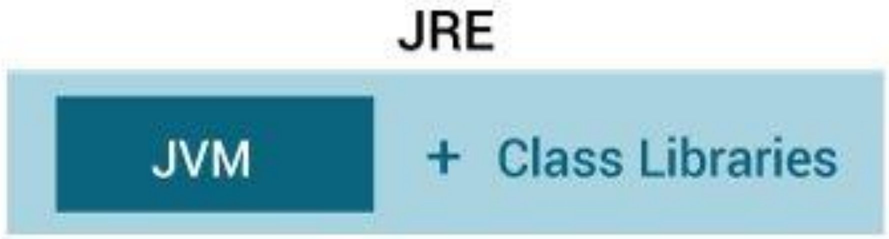
What is JVM

JVM (Java Virtual Machine) is an abstract machine that enables your computer to run a Java program.



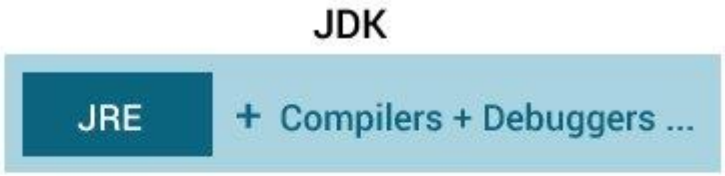
What is JRE?

JRE (Java Runtime Environment) is a software package that provides Java class libraries, Java Virtual Machine (JVM), and other components that are required to run Java applications.



What is JDK?

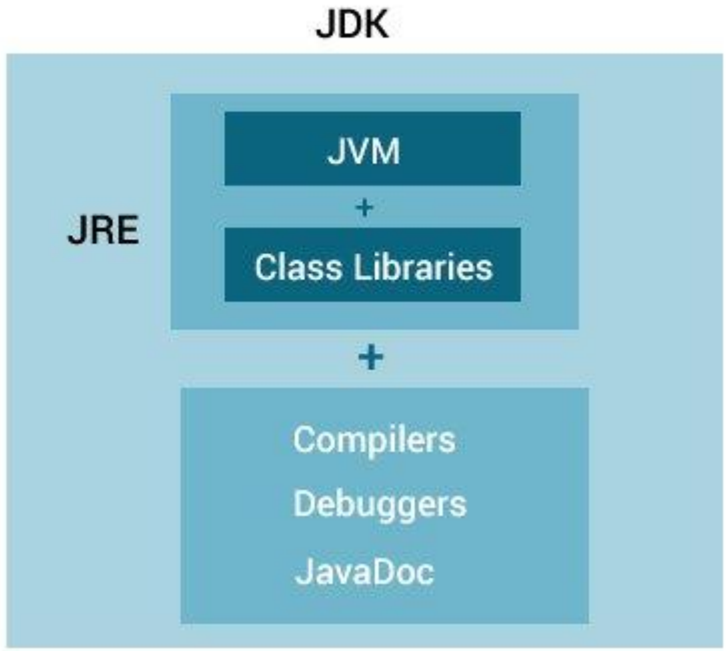
JDK (Java Development Kit) is a software development kit required to develop applications in Java. When you download JDK, JRE is also downloaded with it.



JDK

JRE + Compilers + Debuggers ...

Relationship between JVM, JRE, and JDK.

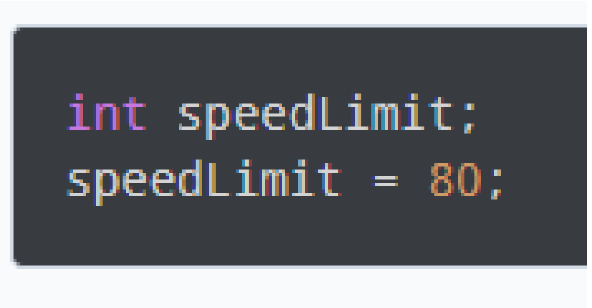


Java Variables and Literals

A variable is a location in memory (storage area) to hold data.

Create Variables in Java

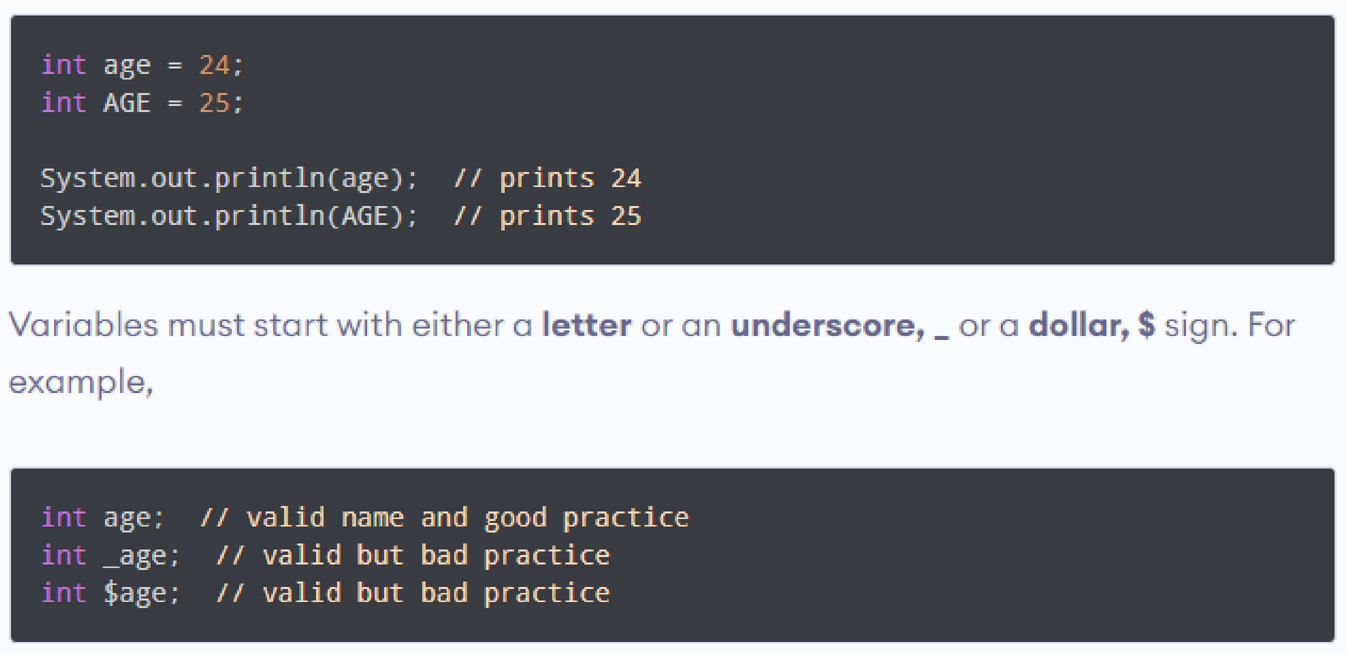
Here's how we create a variable and declare the value in Java,



```
int speedLimit;
speedLimit = 80;
```

Rules for Naming Variables in Java

Java programming language has its own set of rules and conventions for naming variables. Here's what you need to know:

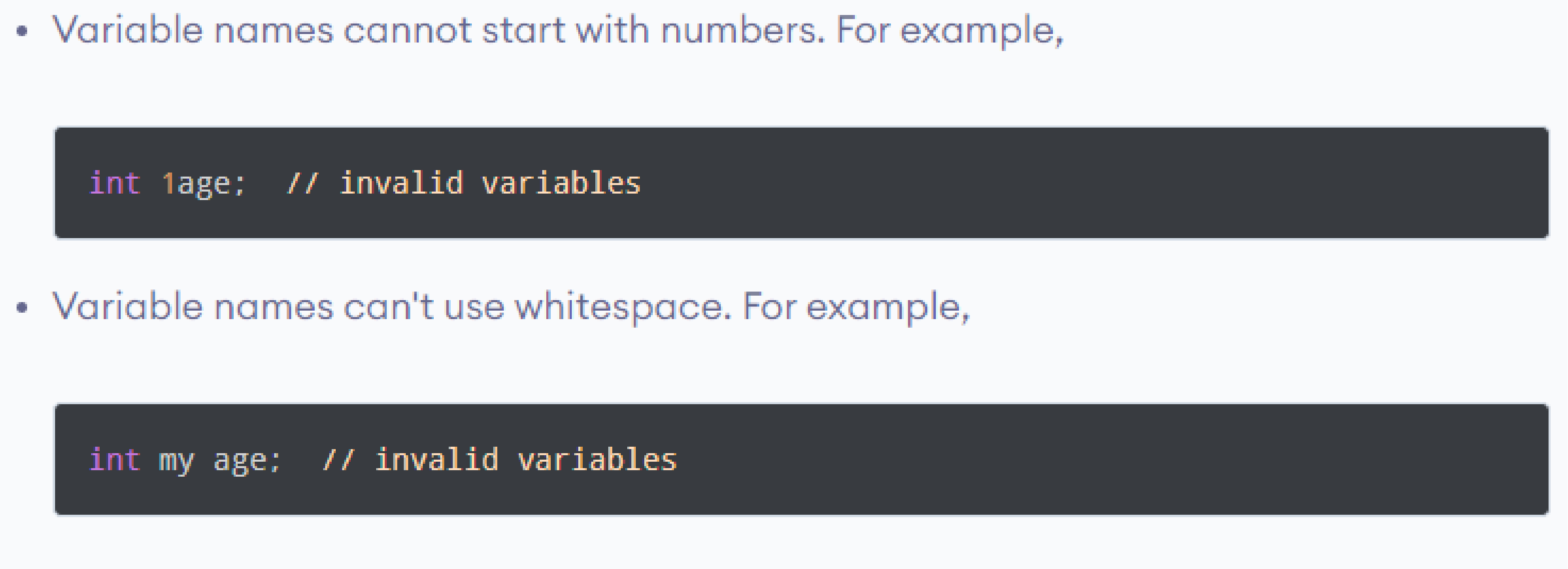


```
int age = 24;
int AGE = 25;

System.out.println(age);  // prints 24
System.out.println(AGE);  // prints 25
```

Variables must start with either a **letter** or an **underscore, _** or a **dollar, $** sign. For example,

```
int age;  // valid name and good practice
int _age;  // valid but bad practice
int $age;  // valid but bad practice
```



- Variable names cannot start with numbers. For example,

```
int 1age;  // invalid variables
```

- Variable names can't use whitespace. For example,

```
int my age;  // invalid variables
```

There are 4 types of variables in Java programming language:

- Instance Variables (Non-Static Fields)
- Class Variables (Static Fields)
- Local Variables
- Parameters

Java literals

1. Boolean Literals

2. Integer Literals

3. Floating-point Literals

4. Character Literals

5. String literals

Java Data Types

8 Primitive Data Types

1. Boolean type (True or False)

2. byte type (-128 to 127)

3. short type (-32768 to 32767)

4. int type (-2^{31} to 2^{31}-1)

5. long type (-2^{63} to 2^{63}-1)

6. double type (double-precision 64-bit floating-point)

7. float type (single-precision 32-bit)

8. char type (16-bit Unicode character)

9. String type

Java Operators

Arithmetic Operators

```
class Main {
  public static void main(String[] args) {

    // declare variables
    int a = 12, b = 5;

    // addition operator
    System.out.println("a + b = " + (a + b));

    // subtraction operator
    System.out.println("a - b = " + (a - b));

    // multiplication operator
    System.out.println("a * b = " + (a * b));

    // division operator
    System.out.println("a / b = " + (a / b));

    // modulo operator
    System.out.println("a % b = " + (a % b));
  }
}
```

Relational Operators

```
class Main {
  public static void main(String[] args) {

    // create variables
    int a = 7, b = 11;

    // value of a and b
    System.out.println("a is " + a + " and b is " + b);

    // == operator
    System.out.println(a == b);  // false

    // != operator
    System.out.println(a != b);  // true

    // > operator
    System.out.println(a > b);  // false

    // < operator
    System.out.println(a < b);  // true

    // >= operator
    System.out.println(a >= b);  // false

    // <= operator
    System.out.println(a <= b);  // true
  }
}
```

Logical Operators

```
class Main {
  public static void main(String[] args) {

    // && operator
    System.out.println((5 > 3) && (8 > 5));  // true
    System.out.println((5 > 3) && (8 < 5));  // false

    // || operator
    System.out.println((5 < 3) || (8 > 5));  // true
    System.out.println((5 > 3) || (8 < 5));  // true
    System.out.println((5 < 3) || (8 < 5));  // false

    // ! operator
    System.out.println(!(5 == 3));  // true
    System.out.println(!(5 > 3));  // false
  }
}
```

Additional Learning Links

JDK Documentation: https://docs.oracle.com/en/java/javase/16/
Variables: https://docs.oracle.com/javase/tutorial/java/nutsandbolts/variables.html
Primitive Data Types: https://docs.oracle.com/javase/tutorial/java/nutsandbolts/datatypes.html

JDK, JRE, JVM: https://www.youtube.com/watch?v=BXFHuaQNnLo

Misc - https://youtu.be/yPYZpwSpKmA