

Computer Language



Introduction to Java



Computer: Hardware

Hardware + Software

(machine, device
physical.)



Computer: Software

kind of program.

↳ computer program, application.) ⇒ running on HW.



Computer: Programming Language

to make program!

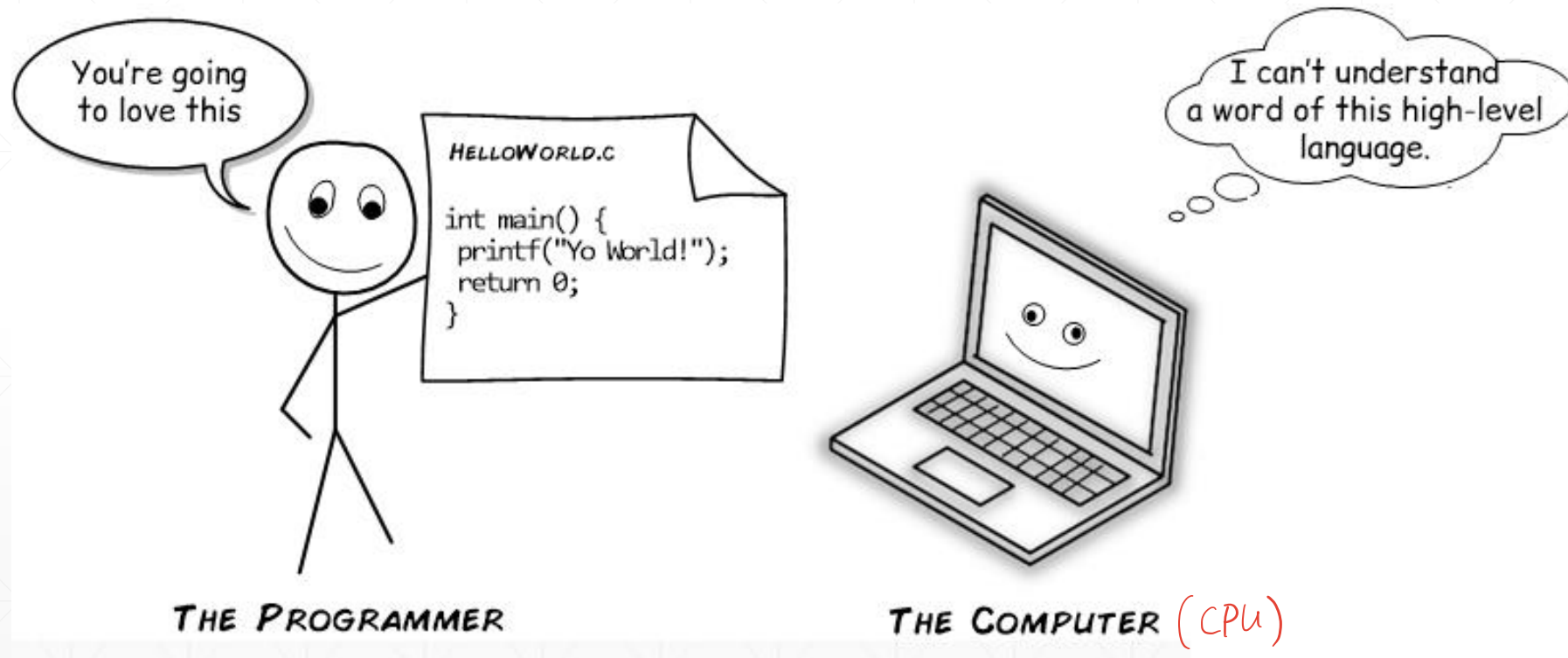
■ Machine language → low-level

- Machine-readable code
- Binary representation (0 & 1)
- CPU only understands this language → human can not understand

■ (High-level) Programming language like (C C++ C# Java JS Python ...)

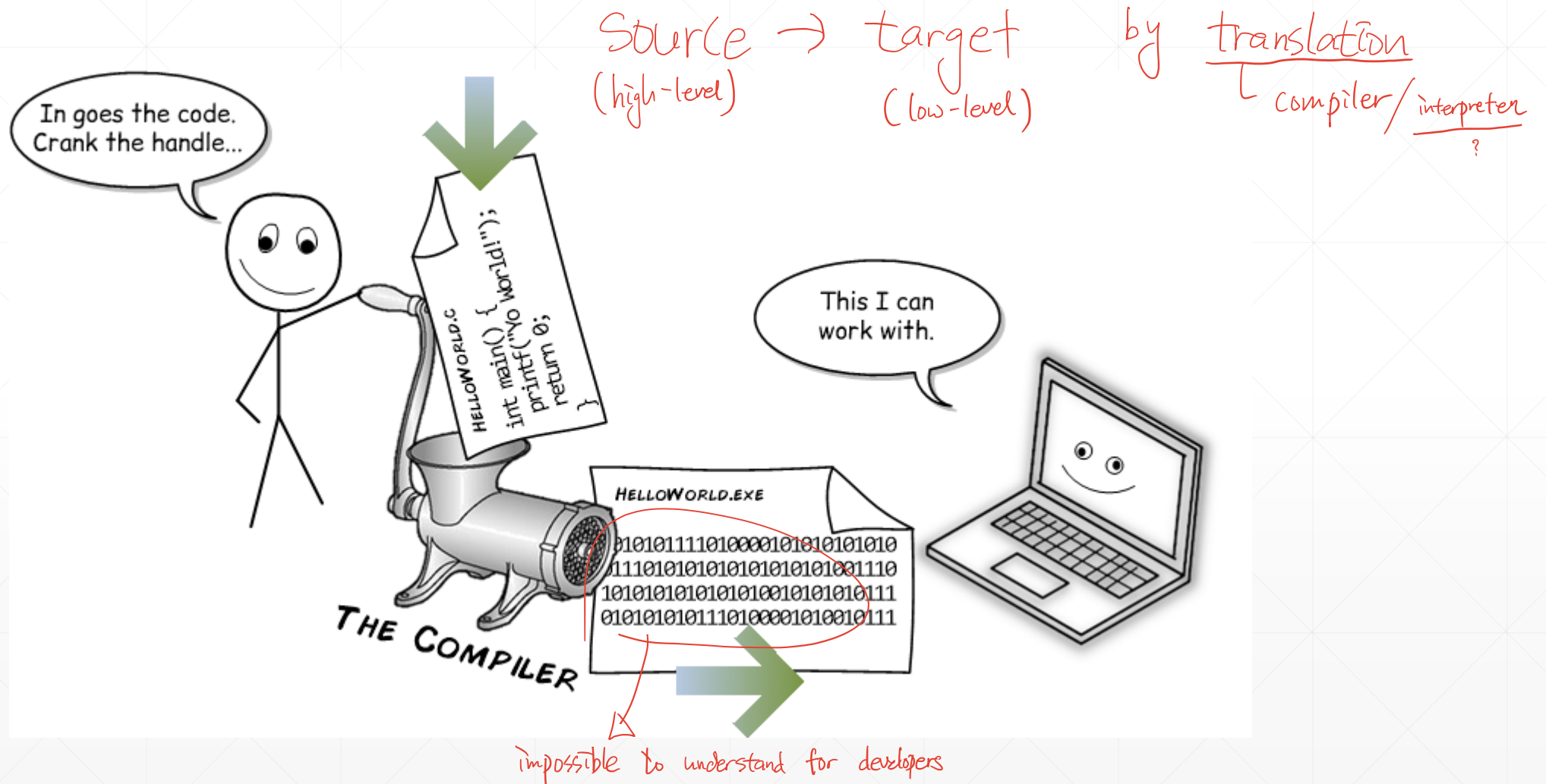
- Human-readable code
- Bridge between a machine and a human
 - But, CPU still cannot understand human-readable representation

Computer: Programming Language (cont'd)

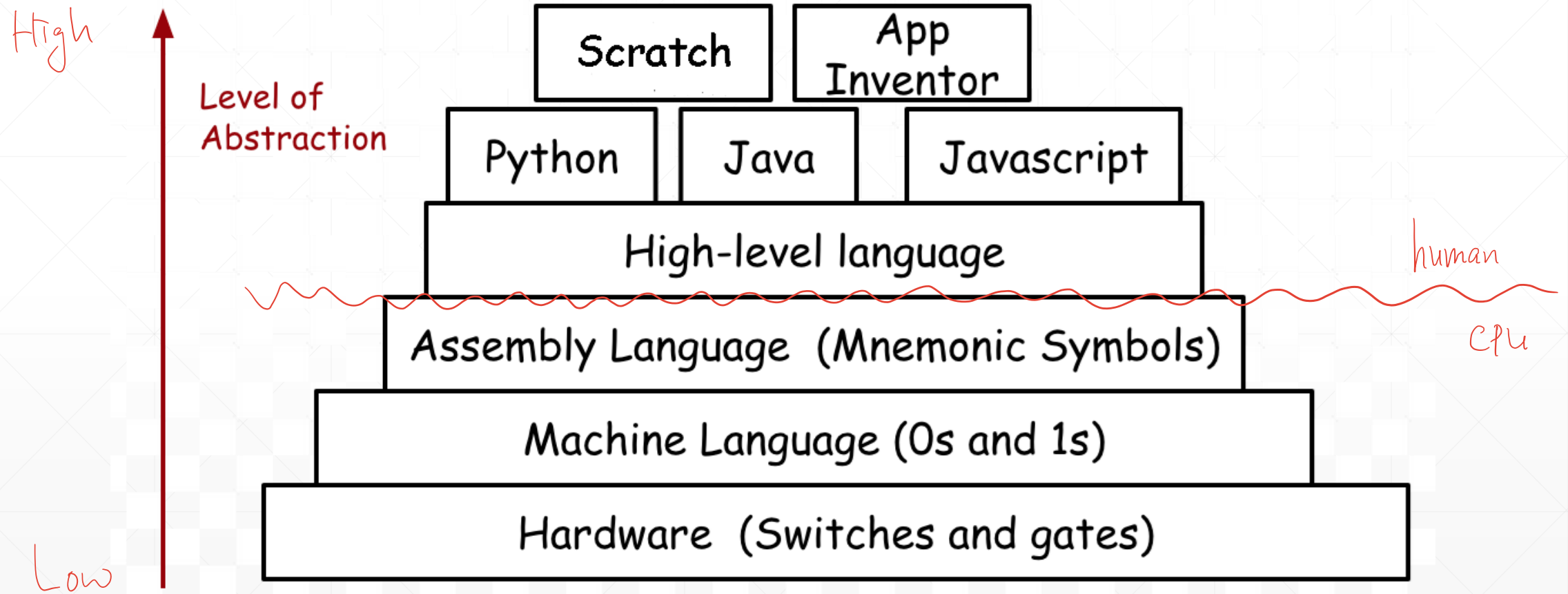


⇒ converting is needed

Computer: Programming Language (cont'd)



Computer: Programming Language (cont'd)



Computer: Programming Language (cont'd)

■ Source file

- Text file written in a (High-level) programming language
- Example) .c, .java file

■ Compile

- Translation from high-level to low-level
- Translates source codes into machine instructions

Java

■ Class-based, object-oriented programming language

- Originally, “Oak” programming language
- Developed by James Gosling
- Released in 1995 by Sun Microsystems
- Still very popular language to develop various kinds of applications
in Android
- Maintained by Oracle since 2010



James Gosling

- Father of Java programming language

Java (cont'd)

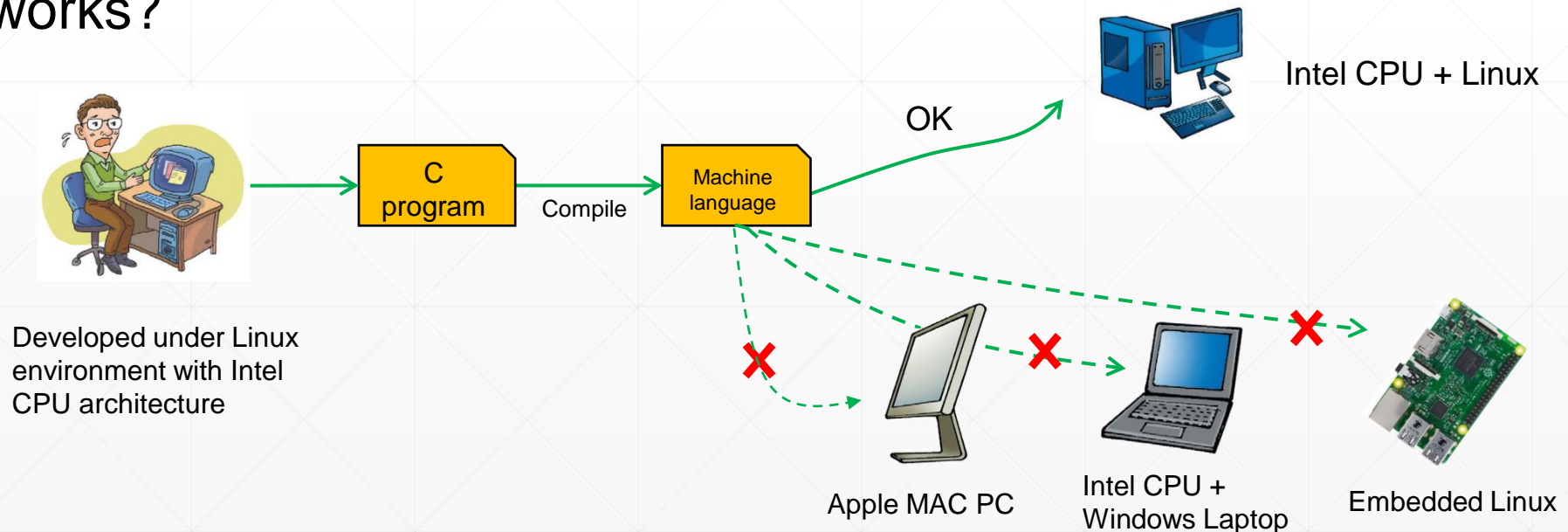
■ WORA (Write Once Run Anywhere) — slogan of Java.

➤ Platform independent (cross-platform) \Rightarrow x86, x64, ARM 등 (architecture) 상관이 없이 실행가능!

HW, OS, ...
• Weakness of traditional languages like C, C++, etc.

➤ A program written in Java can be executed on any architecture

■ How C works?



Java (cont'd)

How Java works?

Write Once !!



Java
program

Bytecode

Run Anywhere!!

Java virtual machine
★ [JVM]



Java virtual
machine

Intel CPU + Linux



Java virtual
machine

Apple MAC PC



Java virtual
machine

Intel CPU +
Windows Laptop



Java virtual
machine

Embedded Linux

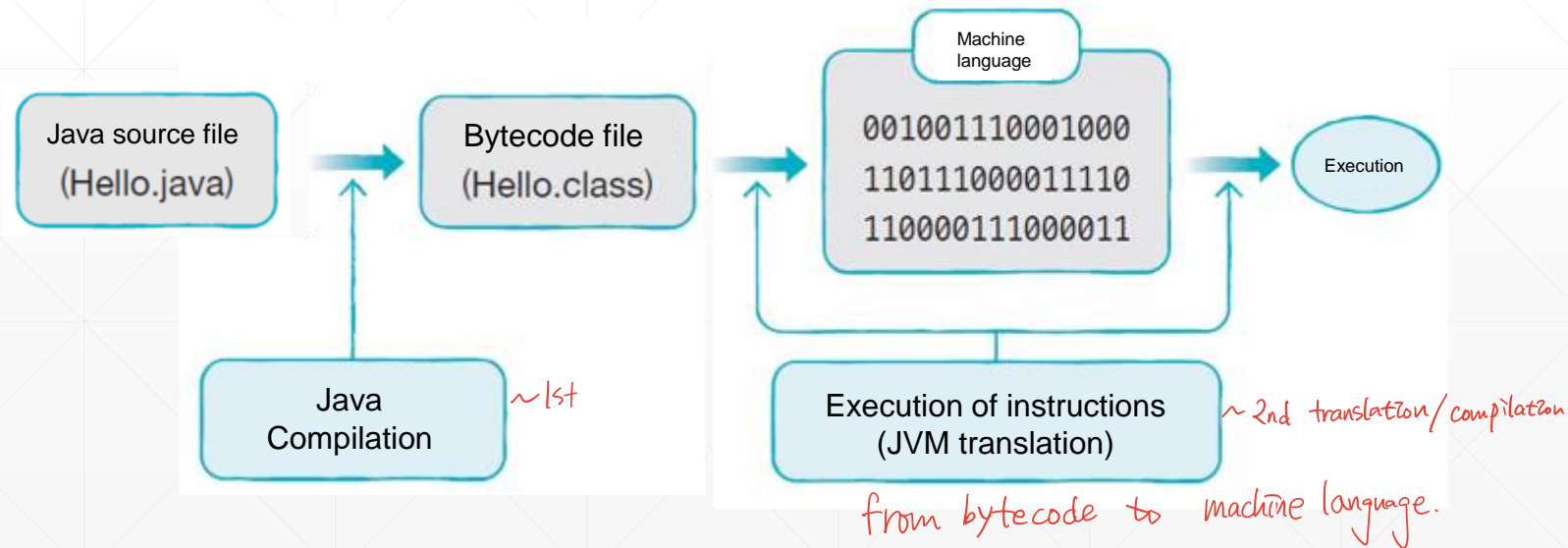
Java (cont'd)

■ WORA (Write Once Run Anywhere)

➤ Java programs consist of byte code files (.class), not complete machine language

- Bytecode files cannot be executed directly on the OS *~> bytecode is not complete machine readable language.
written*

➤ Java Virtual Machine (JVM) translates and executes complete machine language



Java (cont'd)

■ Java Virtual Machine (JVM)

➤ Provides an equivalent Java execution environment

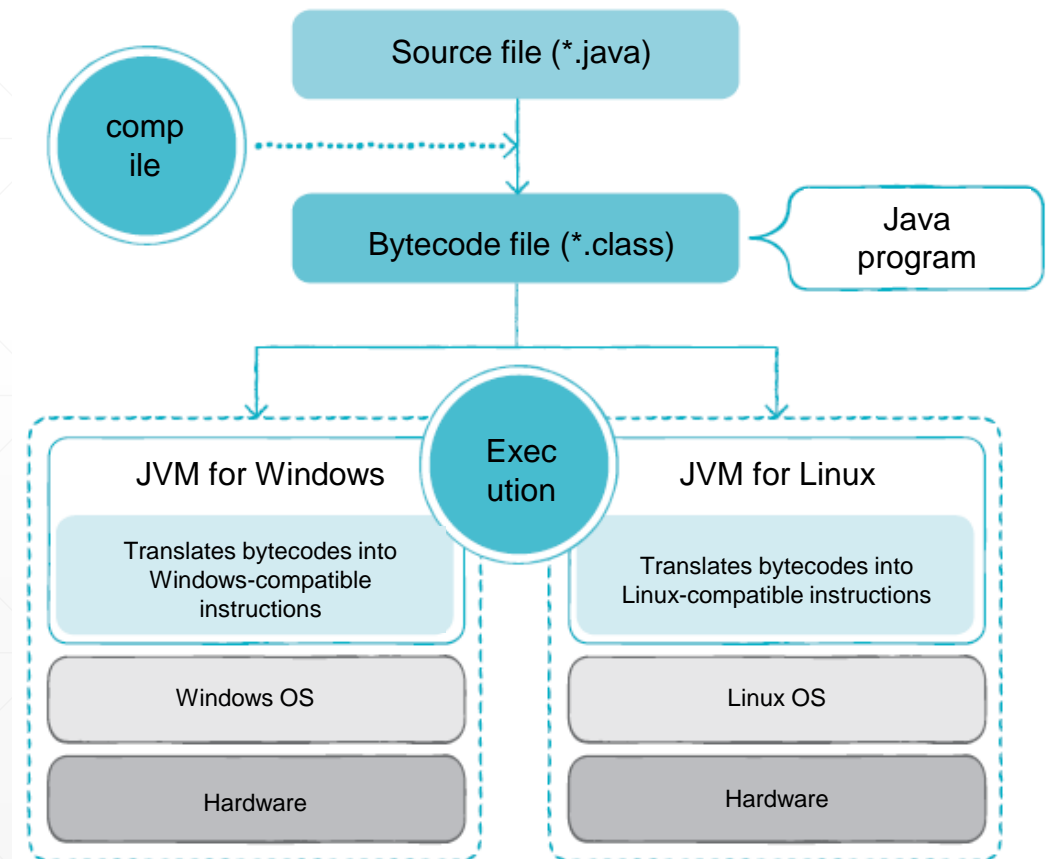
➤ JVM itself is platform dependent

Java code is platform independent

C/C++

*compile → in Intel Cpu + Windows
(machine language
only for Intel CPU & Windows.)*

*⇒ for other config, other compilation required.
... platform dependency!*



Java (cont'd)

■ Object-oriented programming (OOP)

➤ Encapsulation 객체화

➤ Inheritance 상속

➤ Polymorphism 다형성

➤ ...

■ Memory management

■ Multi-threaded

■ Opensource libraries

■ ...

Java (cont'd)

■ JDK/JRE

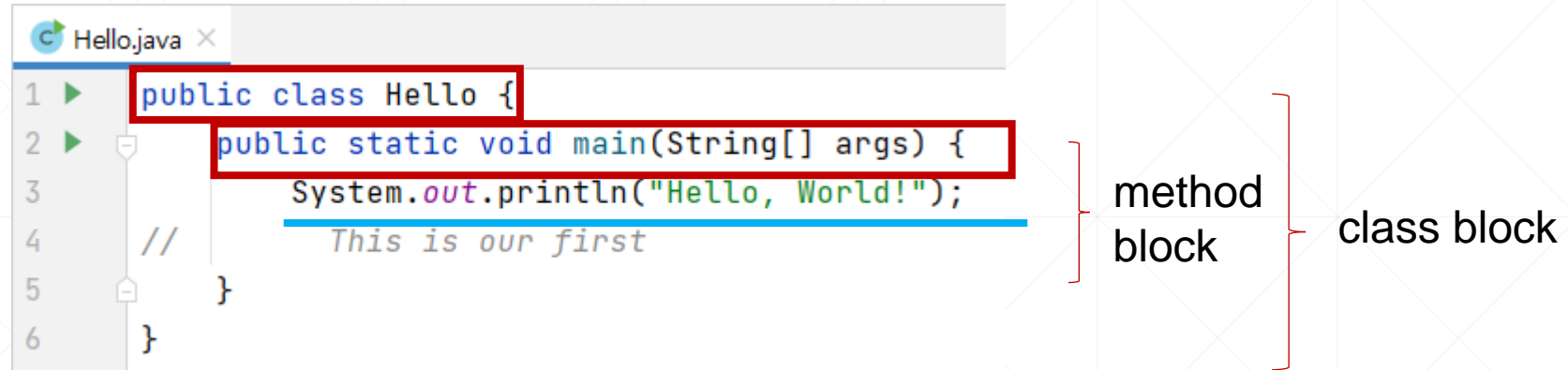
- JDK (Java Development Kit)
 - Environment for developing and executing Java programs
 - JRE + Development Kit
- JRE (Java Runtime Environment)
 - Environment for executing Java programs
 - JVM + Java standard class libraries

■ API/API reference

- Application Programming Interface (API)
 - Pre-built Java class libraries
- API Reference
 - Specification document for APIs
 - <https://docs.oracle.com/en/java/javase/11/docs/api/>

Getting Started

■ Java project



- Defining class and methods
- Statement
 - Semicolon (;) must be appended to represent the end of statements
- Comment
 - Single line (`// ...`)
 - Multiple lines (`/* ... */`)

Q&A

■ Next... in this week (eClass video)

- Variable

- Types