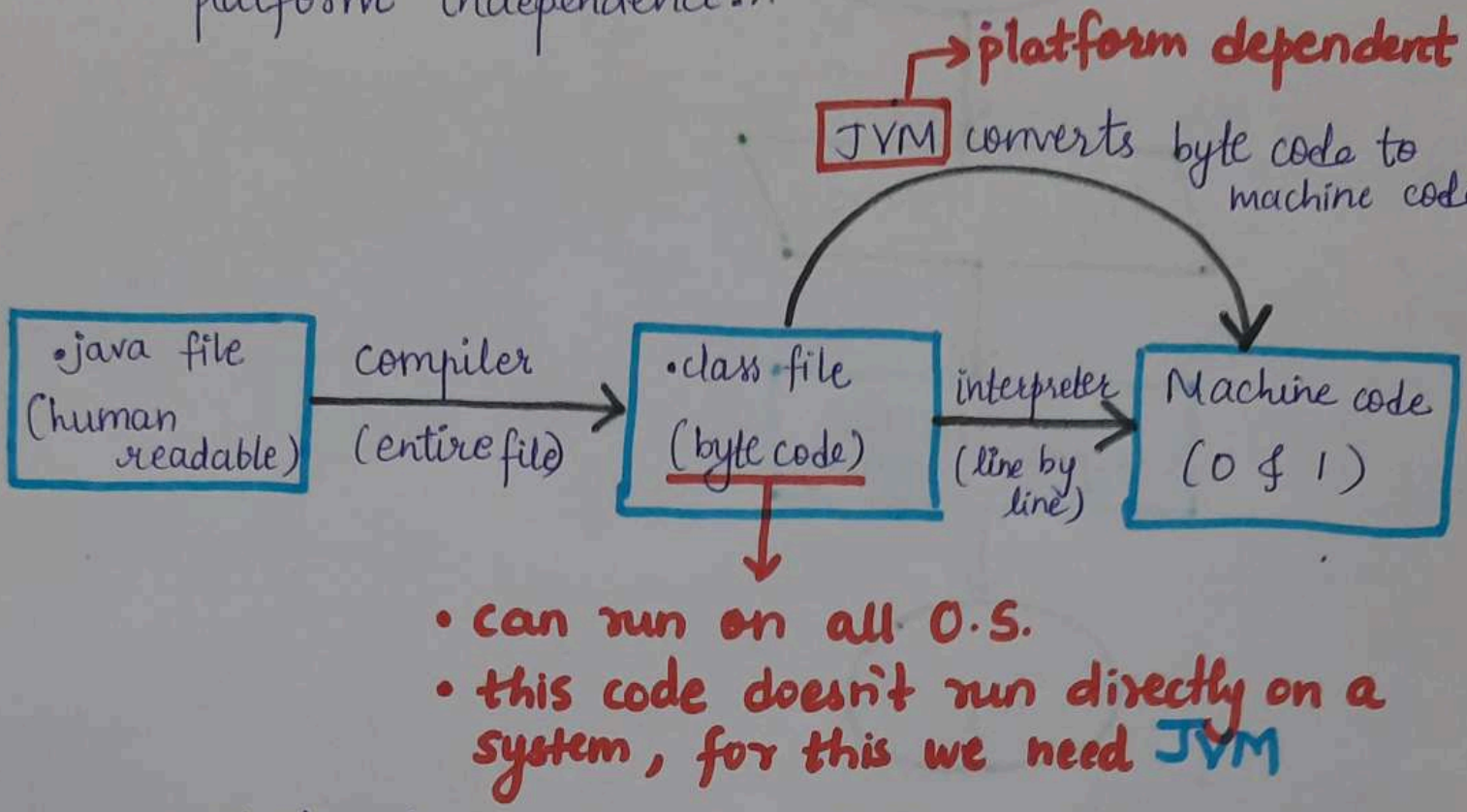
3/8/21

Introduction to Java ♥

★ How Java code executes and more information about platform Independence...



- can run on all O.S.
- this code doesn't run directly on a system, for this we need JVM

★ Therefore, Java is platform independent ★

⇒ We can provide this byte code to any system means we can compile the java code on any system.

⇒ But JVM is platform dependent means for every O.S. the executable file that we get, it has step by step set of instruction dependent on platform.

✯ JDK vs JRE vs JVM vs JIT

JDK [Java Development Kit]

↳ provides environment to develop & run Java program

JRE [Java Runtime Environment]

↳ provides environment to only run the program

- → deployment technologies
- → user interface toolkit
- → integration libraries
- → base libraries

etc.

JVM [Java Virtual Machine]

JIT [Just-in-time]

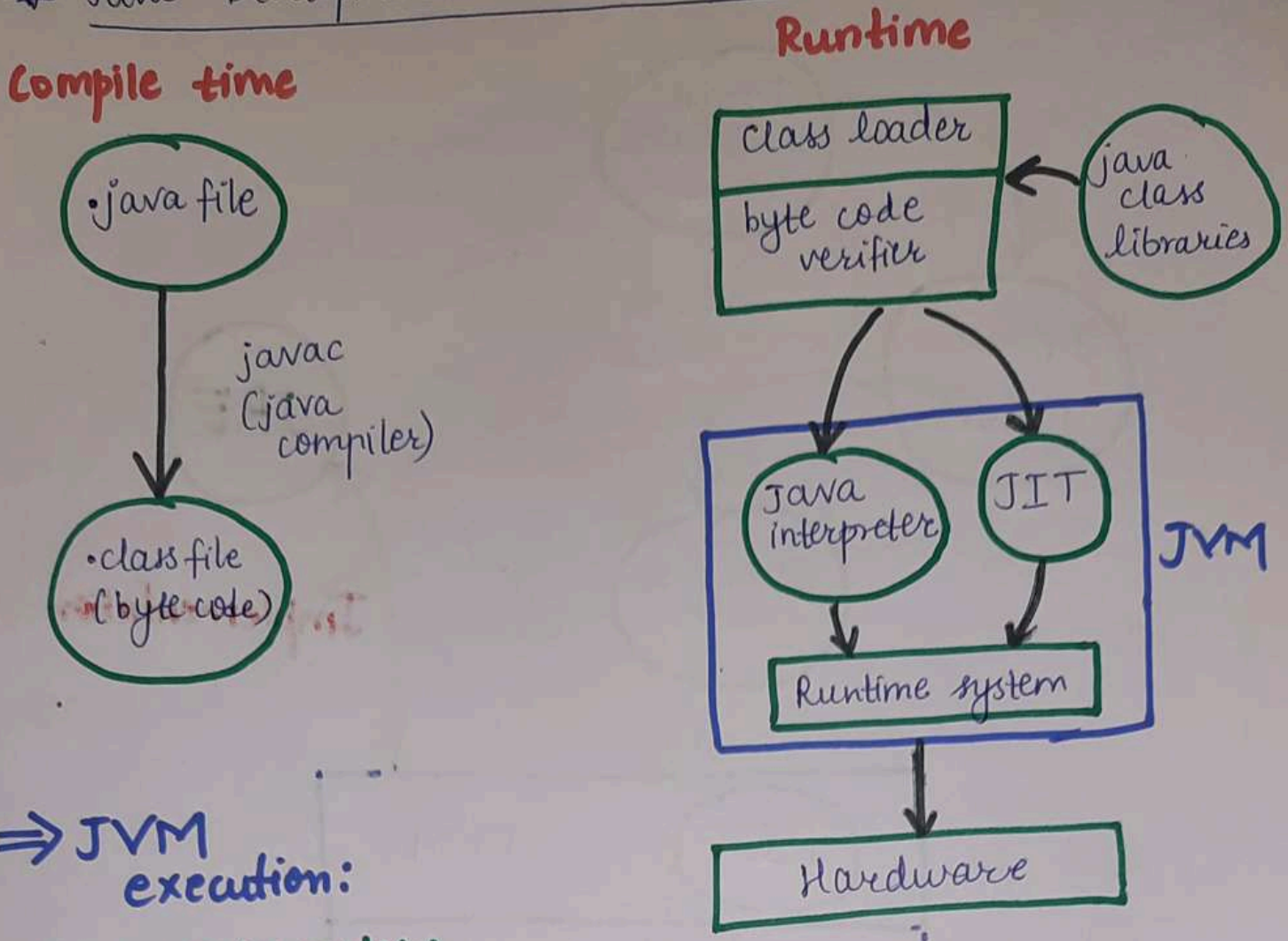
- → Java Interpreter
- → Garbage collector

etc.

- → development tools
- → javac → Java compiler
- → archiver → jar
- → docs generator ↳ javadoc
- → interpreter/loader

etc.

✱ Java Development and Runtime Environment



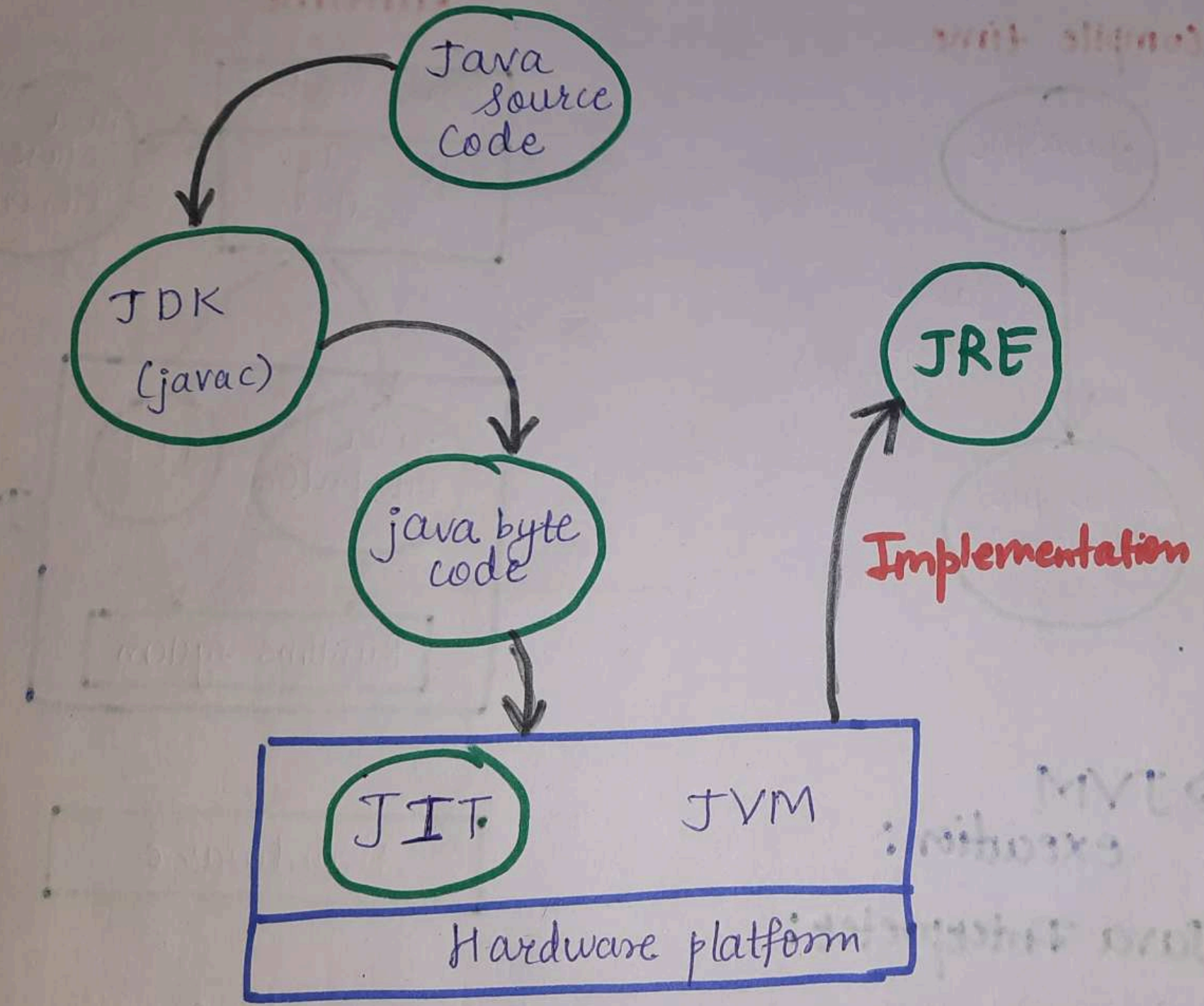
⇒ JVM execution:

- **Java Interpreter:**
  - → line by line execution
  - → when one method is called many times, it will interpret again & again
- **JIT:**
  - → methods that are repeated, JIT provides direct machine code so re-interpretation is not required
  - → makes execution faster
- **Garbage Collector**

✱ Class loader:

- **Loading**
  - → reads byte code file & generates binary data
  - → an object of this class is created in heap
- **Linking**
  - → JVM verifies .class file
  - → allocates memory for class variables & default values
  - → replace symbolic references from the type with direct references
- **Initialization**
  - → all static variable are assigned with their values defined in the code & static block.

Summary:


Java Source Code
JDK (javac)
java byte code
JRE
Implementation
JIT
JVM
Hardware platform