JAVA

Course 1

Modern Java : The Big Picture
→ what is java all about

Java → Programming Language

Java → Runtime environment

Java → Standard library
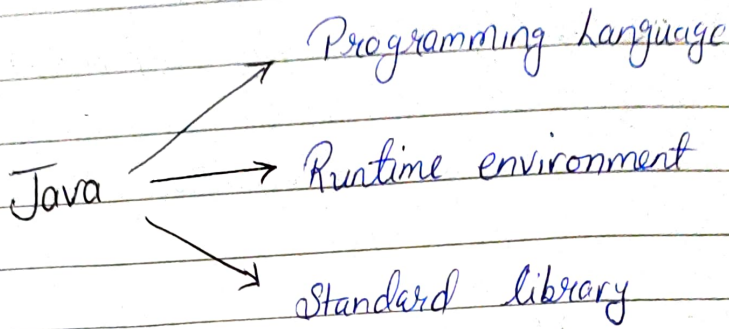
These 3 parts of java platform are bundled together as Java Development kit, or JDK in short.

○ **How java runs ?**


```
┌─────────────┐   Compiles    ┌─────────────┐┌──────────┐
│ Application  │──── to ──────>│ Application  ││ Third    │
│ Source code  │               │ Byte code    ││ party    │
└─────────────┘               └─────────────┘│ libraries │
Programming                                   └──────────┘
language

                    Standard  ┌──────────────────────────┐
                    library   │ Java  Standard Edition APIs│ ┐
                              └──────────────────────────┘  │ JDK
                    Runtime   ┌──────────────────────────┐  │
                    environment│ Java Virtual Machine     │  ┘
                              │        JVM                │
                              └──────────────────────────┘

                              ┌──────────────────────────┐
                              │   Operating System        │
                              └──────────────────────────┘
                              ┌──────────────────────────┐
                              │      Hardware             │
                              └──────────────────────────┘
```

eg
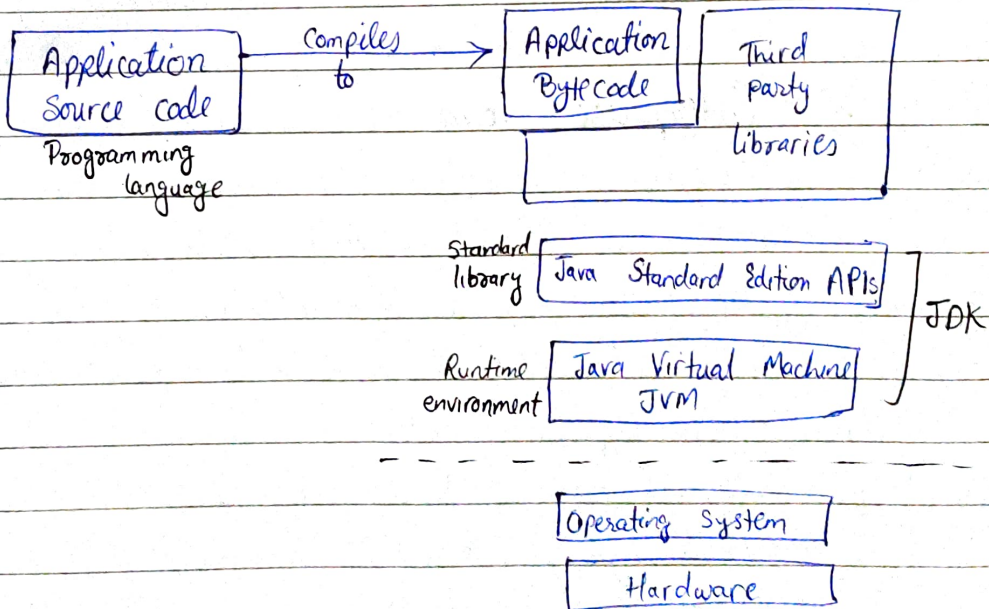
Hello.java ──── Java C ────> Hello.class (Bytecode)
                compiler

- Principles of Java :
  a) Portability
     Byte code will be same for all OS
     just need to change JVM
  b) Readability (simplicity & openness)
     Easy to read & understand code
     helps in better collaboration

o <u>Java Usecases</u> ⭢

a) Desktop Apps :-
   Some GUI toolkits in Java
   1) AWT   (Abstract windowing Toolkit)
   2) SWing
   3) Java FX   (advanced , have animations too)

b) Enterprise Java (Java EE [enterprise edition])
   advance applications with web apps, database etc.
   • Java EE is set of API specifications geared
     towards enterprise application
   So that we don't need hundreds of external API's
   1) WildFly (Red Hat)
   2) Websphere (IBM)
   3) WebLogic (oracle)
   4) Tomcat (Apache)

c) Java in Cloud :-
 ○ web applications in cloud
 ○. done by building microservices
 So need Microframeworks like Spring Boot,
 microProfile , Vert.x , Play Framework

d) Mobile App development
 ○ Android apps in Java

○ <u>Java Development Lifecycle</u>

Code → Build → Test → Static Analysis → Code (cycle)
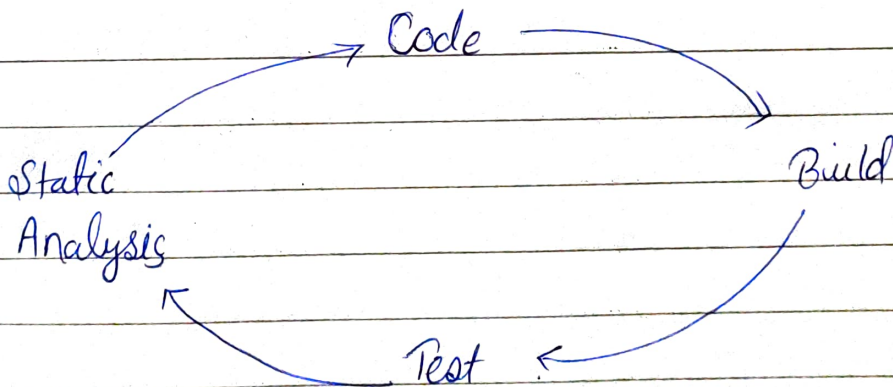
IDE's
<u>IDE's</u>
Integrated Development Environment
1) Eclipse
2) IntelliJ

Unit testing
1) JUnit
2) Mockito

Build Tools
1) Maven
2) Gradle