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INTRODUCTION TO JAVA

How Java code executes.

.java file	Compiler →	.class file	Interpreter →	Machine Code
(human readable)	(entire file)	(byte code)	(line by line	0 & 1

Source Code - Don't runs directly
need JVM to
run this file.

How Java is platform independent.

- Java is platform independent as the same ~~.cal~~ .class file (byte code) can run on any device using JVM (Java Virtual Machine)
- Don't have to re-compile the code for different Operating system
- 'Write one, Run Anywhere'

- But JVM is a platform dependent.

Architecture

JDK = JRE + Development Tools (Java Development kit)

↓

JRE = JVM + Library Classes (Java Runtime Environment)

↓

JVM (Java Virtual Machines)

↓

JIT (Just in time) {Compiler}

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JDK (Java Development kit)

- Provides environment to develop & run the Java program
- It is a pakage that includes :-

1. development tools · to provide an environment to develop your programs.
2. JRE - (Java Runtime Environment) - to execute your ~~prog~~ program.
3. a compiler - javac
4. archiver - jar
5. docs generator - javadoc.
6. interpreter / loader

JRE (Java Runtime Environment)

- It is an istallation package that provides environment to only run the program.
- It consist of :-

1. Deployment technologies
2. User interface toolkits
3. Integration libraries
4. Base libaries.
5. JVM

- After we get .class file, the next things happens at runtime.

1. Class loader loads all classes needed to execute program.
2. JVM sends code to Byte code verifier to check format of code.

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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 program

→ development tools

→ javac → Java Compiler

→ archiver - jar

→ docs generator - javadoc

→ Interpreter/ loaders etc.

JVM [Java Virtual Machine]

→ deployment technologies

→ user interface tool kit

→ integration libraries

→ Base libraries etc.

JIT [Just-in-time]

→ Java interpreter

→ Garbage Collector etc.

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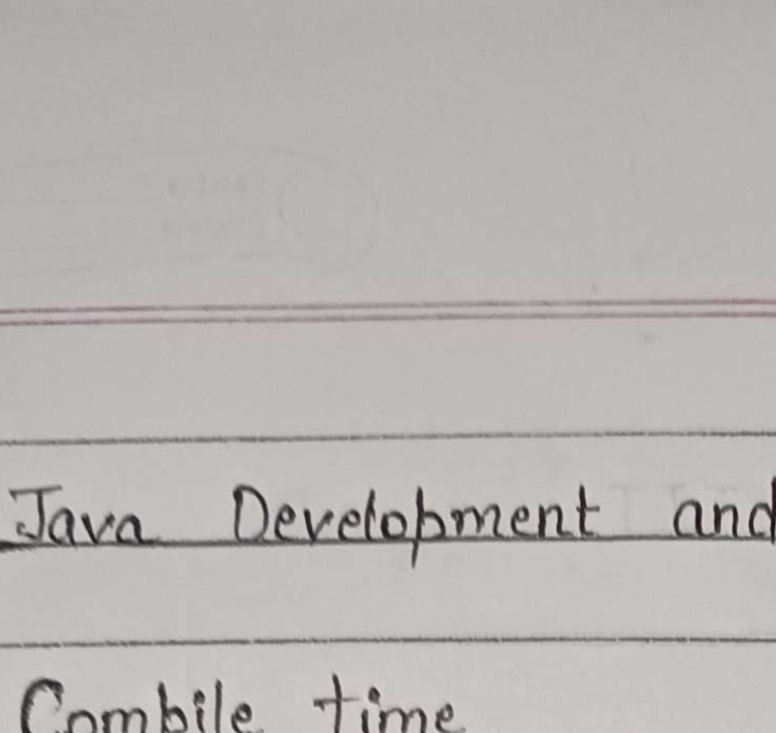
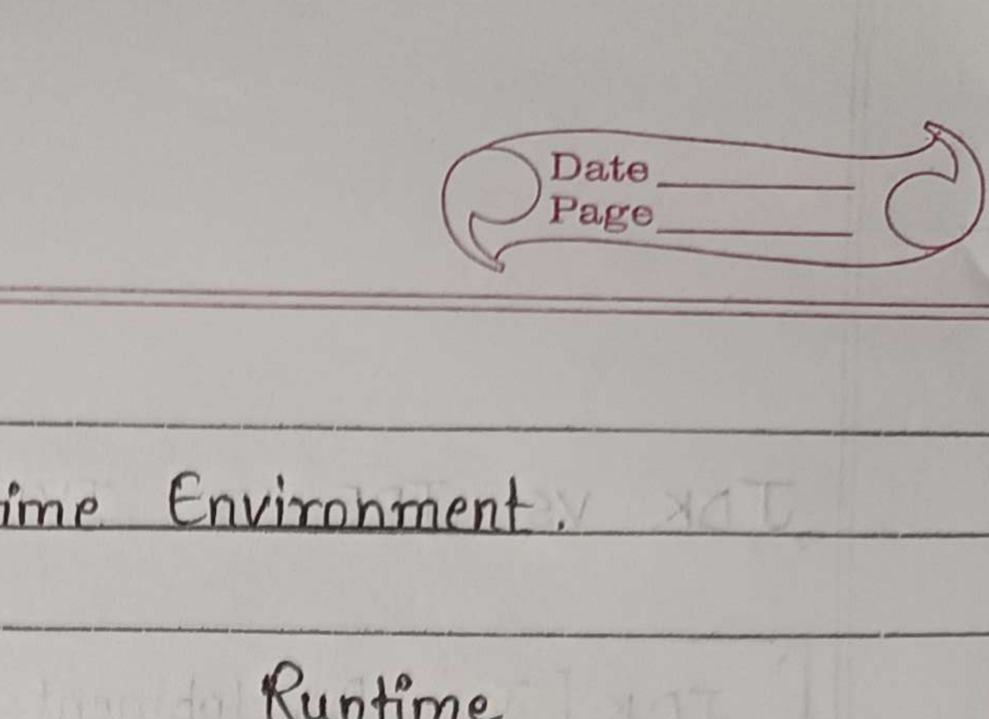
Java Development and Runtime Environment.

Compile time



Runtime



⇒ 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-interpetation is not required
  - makes execution faster.

- Garbage Collector :-

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* Class loader :-

- Loading :-

- reads byte code file & generates binary data
- an object of this class is created in heap memory

- Linking :-

- JVM verifies .class file.

- allocates memory for class variables & default values
- replace symbolic reference from the type with direct reference.

- Initialization

- all static variables are assigned with their values defined in the code & static block.

Note :-

- Static variable are the variables donot depends up on object of classes.

- JVM gives executable code which runs in JRE.

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☆ Summary :-