



JAVA

Concepts of Programming Day 1: March 2022

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java

Outlines

- Introduction
- Why Java?
- Where it is used?
- Characteristics of Java
- Java Platform Editions
- Evolution of Java
- Understanding JDK, JRE and JVM
- How Java is platform-independent
- Packages

Java

- General purpose Programming language.
- Supports OOP
- Developed by Sun Microsystems of USA in 1991
- Called as OAK by **James Gosling**
- Discovered to overcome the limitations of C and C++ in terms of both reliability & portability
- Thus, Java a really simple, reliable, portable & powerful language.

Day 1: 08-03-2022

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Module 1 : CPOS= COP + OS

COP :

Internal MCQ Exam : 20 marks

Lab Exam for : 40 marks

COP: Concepts of Programming

Java:

- General programming Language
- High level language, (English), robust, secured, portable
- Object Oriented Programming (OOPS) programming
- Developed by Sun Microsystem
- Invented by James Gosling
- Platform : Any hardware or Software environment in which a program runs.
- Internet Programming Language
- Java enables user to develop and deploy applications on the Internet for servers, desktop computers and small hand held devices
- Overcomes the limitations of C and C++ programming

Applications of Java



**Desktop
GUI**



Enterprise



Scientific



**Web-
based**



**Cloud-
based**



Gaming

Applications of Java:

1. Standalone Application

- desktop application
- install the software and use it in your machine.
- eg., Media players, antivirus application, AWT interface for application, games, etc.

2. Web Applications

- applications that runs on server
- we can create various dynamic pages for websites
- e.g.,: Servlet, JSP, Hibernate, Spring, JSF technologies used in programming

3. Enterprise Application

- distributed in nature
- eg. Banking application
- adv point: high level of security, load balancing, clusters, etc.
- EJB is used to create enterprise applications

4. Mobile Applications

- created for mobile devices
- Android and ME (Mobile Edition)

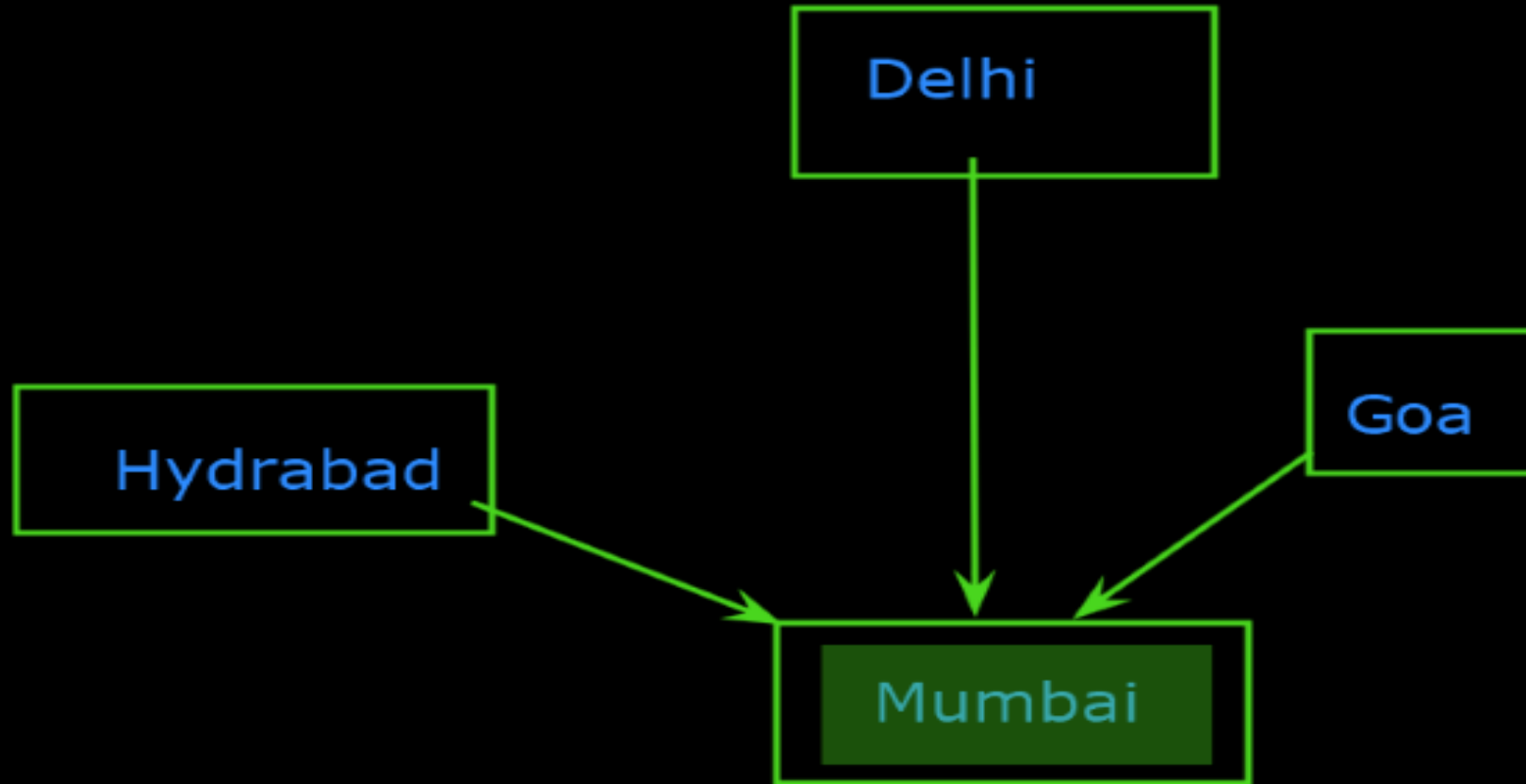
5. Others Applications

Embedded System, Smart cards, Robotics, Games, etc

2. Web Applications

- applications that runs on server
- we can create various dynamic pages for websites
- e.g.,: Servlet, JSP, Hibernate, Spring, JSF technologies used in program

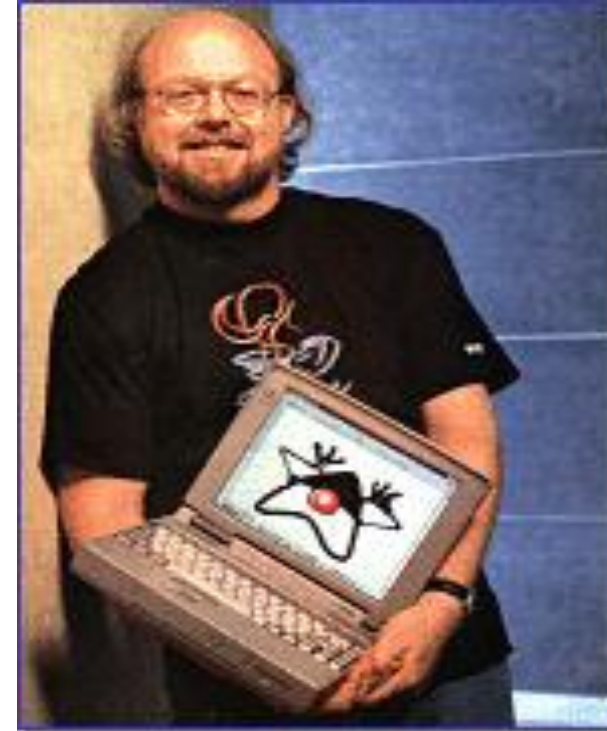
3. Enterprise Application



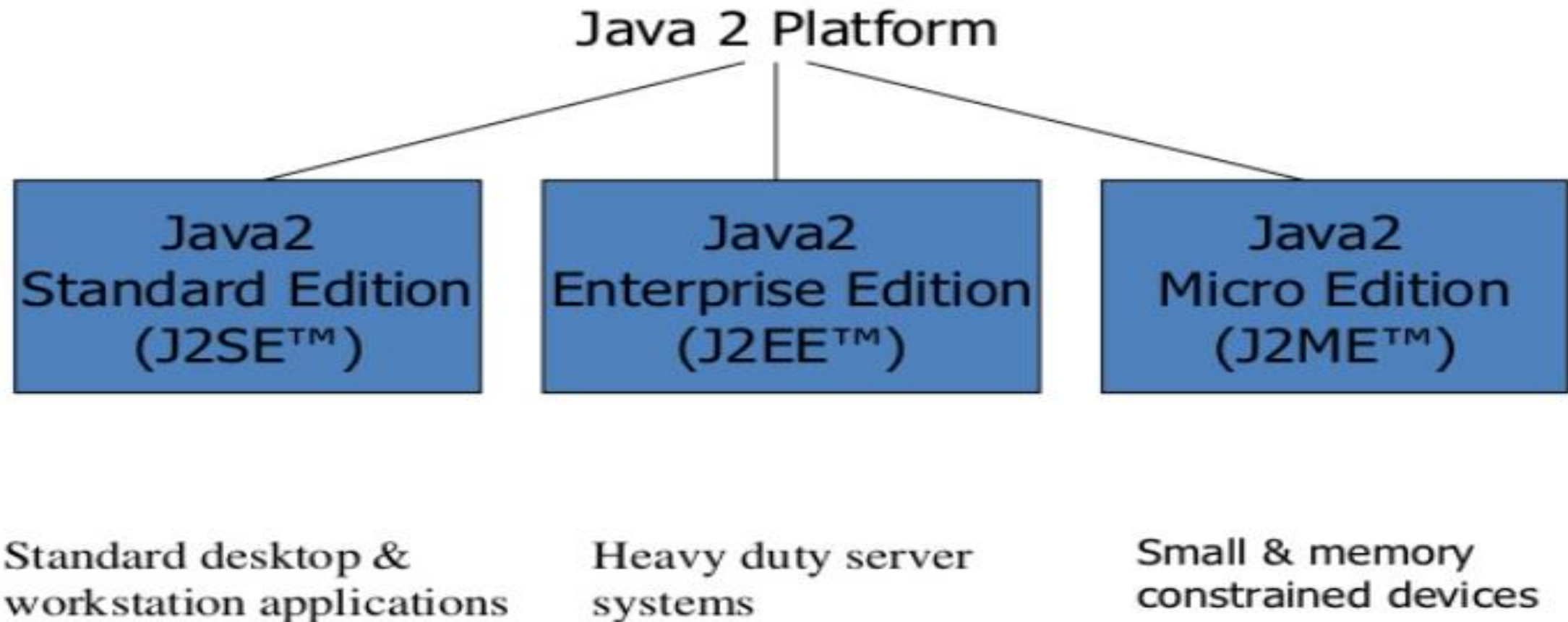
Distributed Applications

James Gosling

- James Gosling is generally credited as the inventor of the Java programming language
- He was the first designer of Java and implemented its original compiler and virtual machine
- He is also known as the Father of Java.



Java Platforms / Editions



Java Editions/Platforms:

1. J2SE: Java 2 Standard Edition

-purpose: to design desktop applications

2. J2EE: Java 2 Enterprise Edition

-purpose: to handle heavy duty server systems

3. J2ME: Java 2 Micro Edition

-purpose: to design small & memory constrained devices

JDK Version:

JDK Alpha and Beta: 1995

JDK 1.0 : 1996

JDK 1.1 : 1997

JDK 1.2 : 1998

JDK 1.3 :

JDK 1.4 :

JDK 5.0 : 2004

JDK 6.0

JDK SE 7.0

JDK SE 8 : 2014 (most stable version) : Lambda expression , Annotations, Date API

2014 : Oracle

...

... 08-03-2022

KW: CDAC Mumbai (JH/KH)

JDK 17

JDK Versions

- JDK Alpha and Beta (1995)
- JDK 1.0 (23rd Jan, 1996)
- JDK 1.1 (19th Feb, 1997)
- J2SE 1.2 (8th Dec, 1998)
- J2SE 1.3 (8th May, 2000)
- J2SE 1.4 (6th Feb, 2002)
- J2SE 5.0 (30th Sep, 2004)
- Java SE 6 (11th Dec, 2006)
- Java SE 7 (28th July, 2011)
- Java SE 8 (18th March, 2014)

Writing your first Java program

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

Standalone Programming:

main():initial point to start your execution

class name

```
class Hello
```

```
{
```

```
    public static void main (String [] args)
```

```
{
```

```
    ...
```

```
}
```

```
}
```

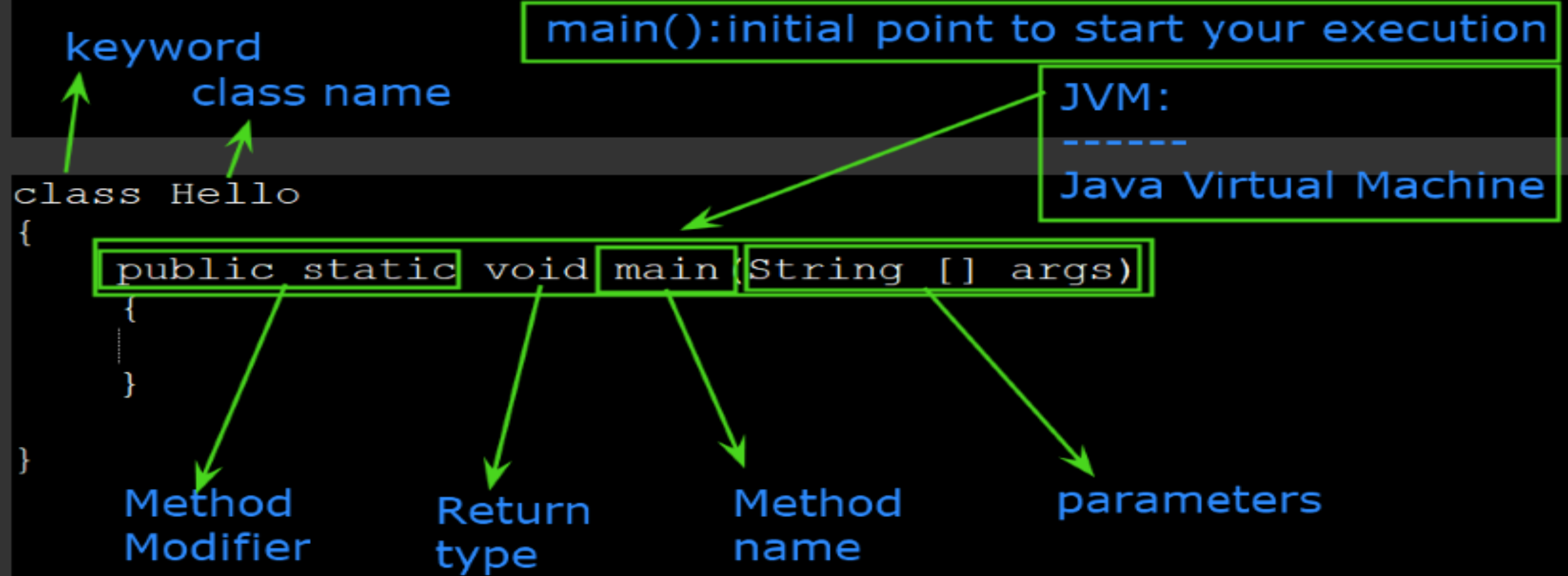
Method
Modifier

Return
type

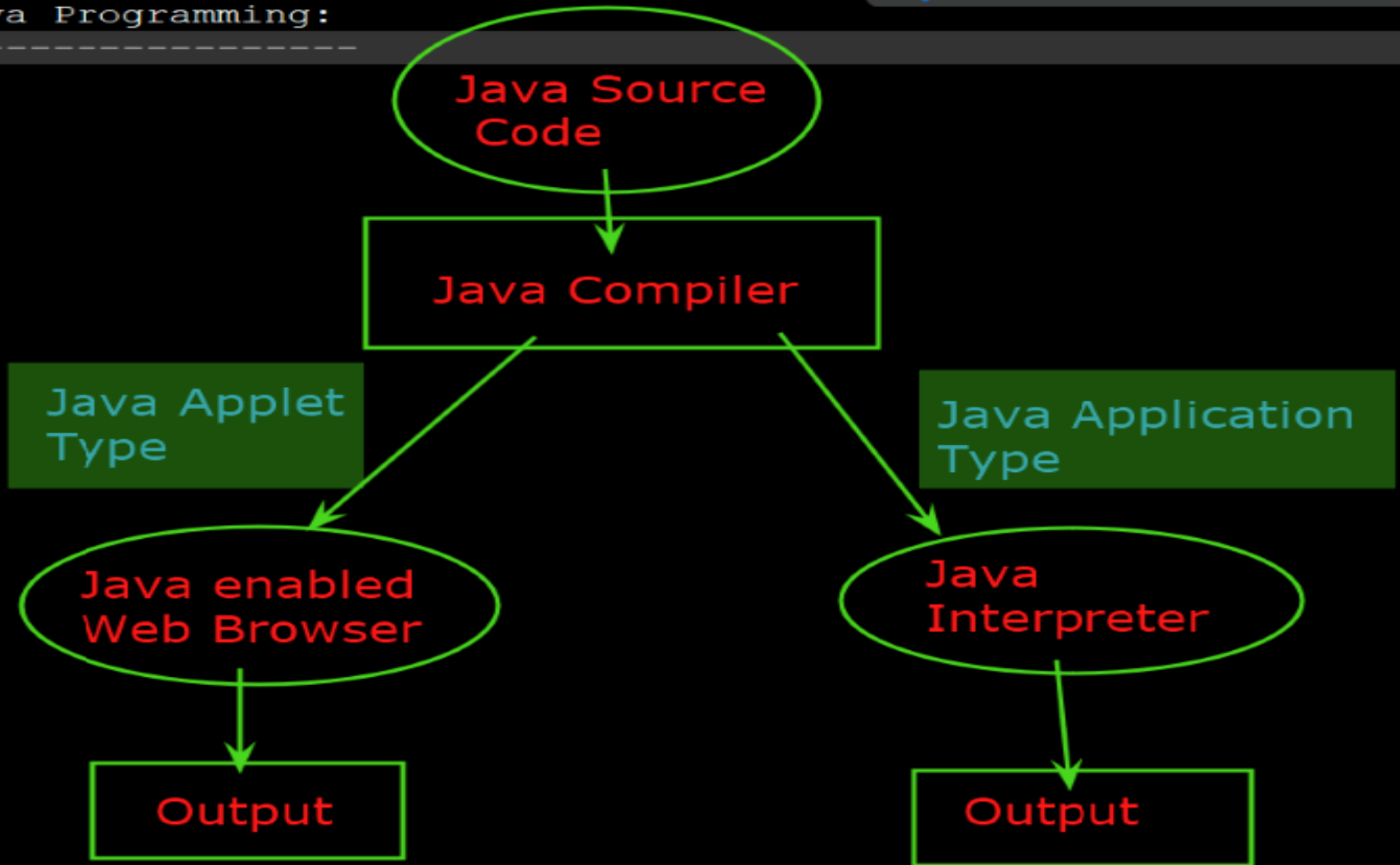
Method
name

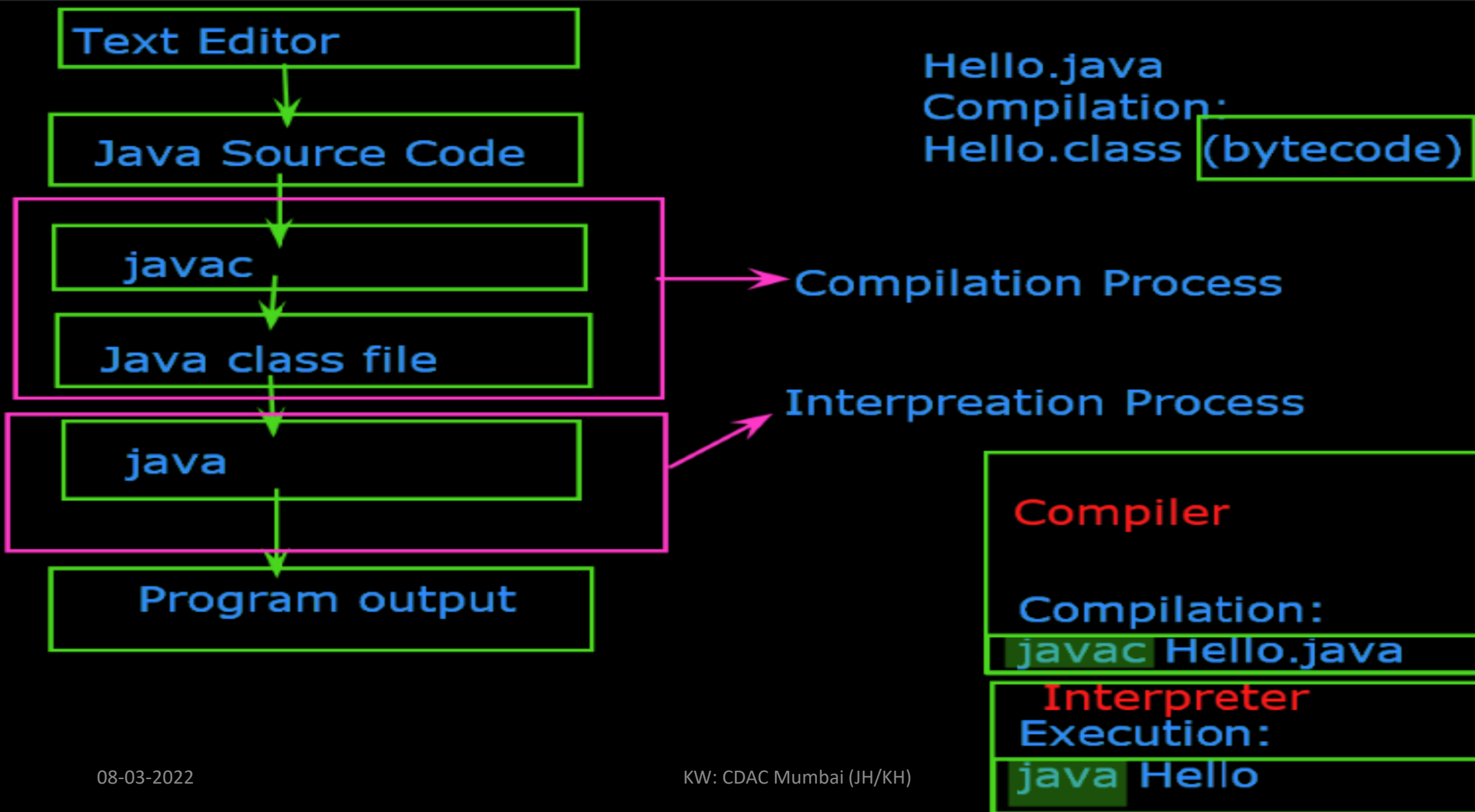
parameters

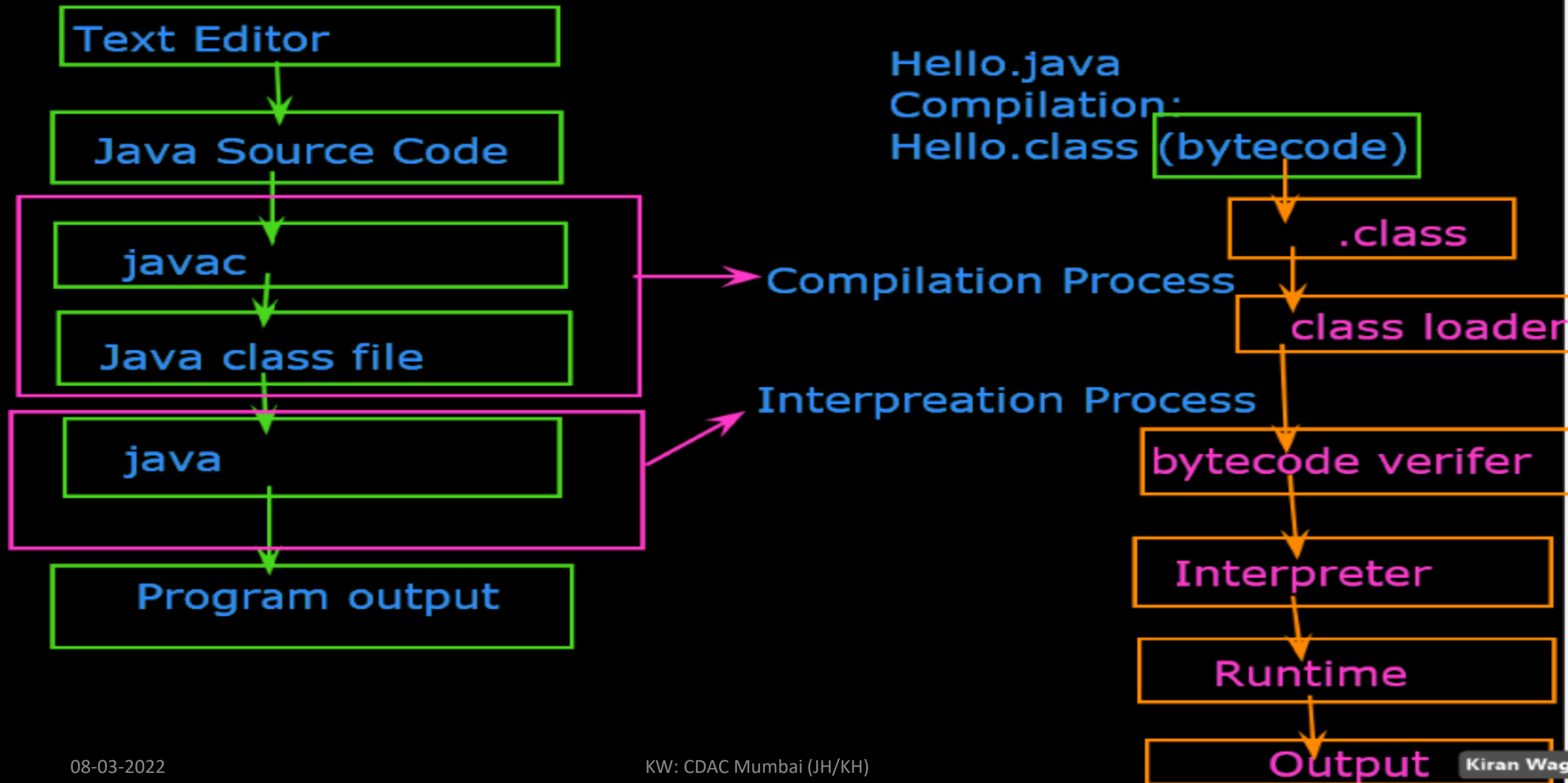
Standalone Programming:



Ways of Java Programming:

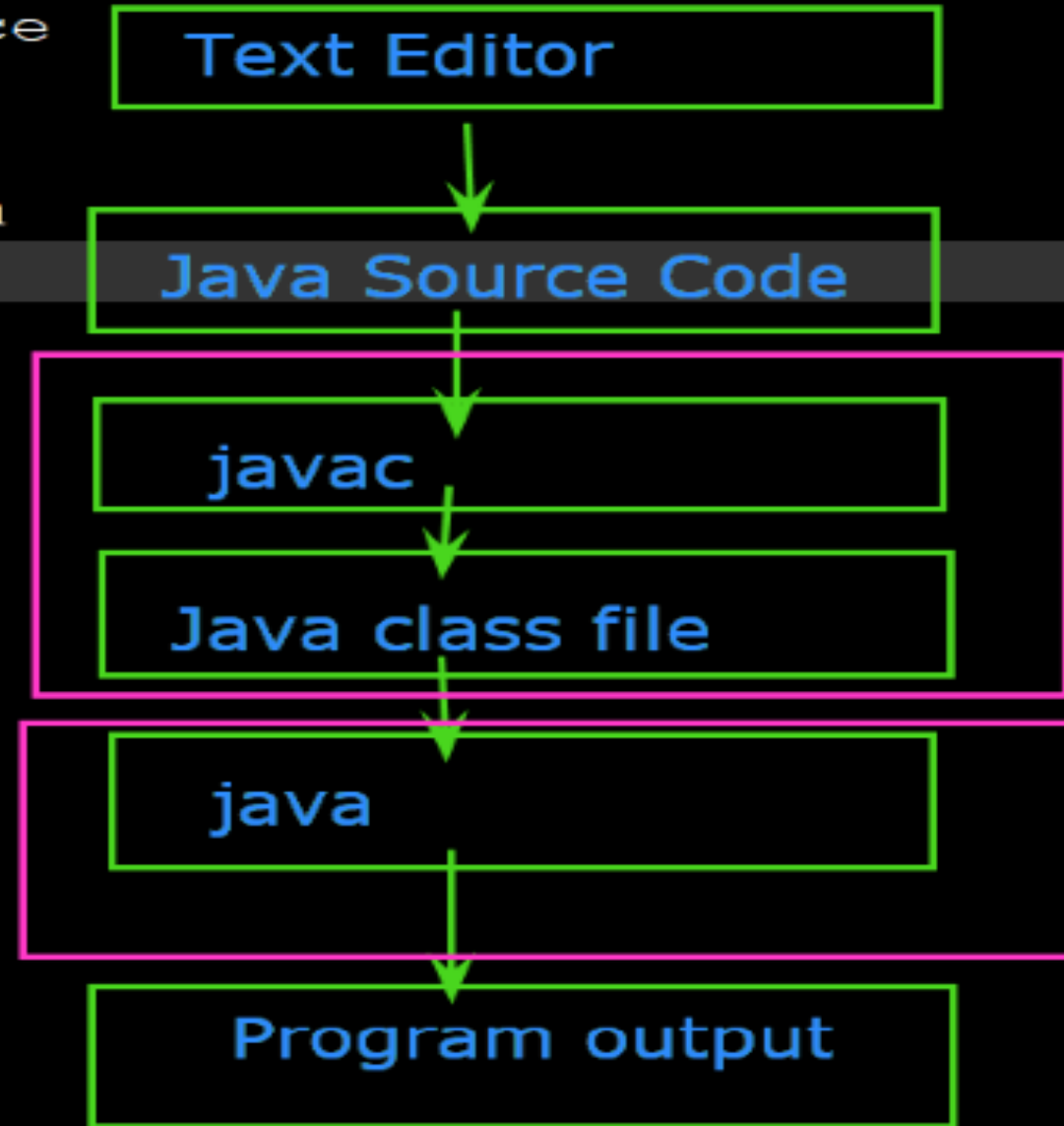






Compilation Process:

- Just-in-Time (JIT) Compiler
- improves the performance
- Performance:
 - Time of execution
 - Space of execution



Bytecode:

Platform Independent

Java Source Code

Java Compiler

Bytecode

(.class file)
(machine-independent)

Any Platform

Windows
(Pratik)

MacOS
(Saurabh)

Linux
(Siddhesh)

output

Output

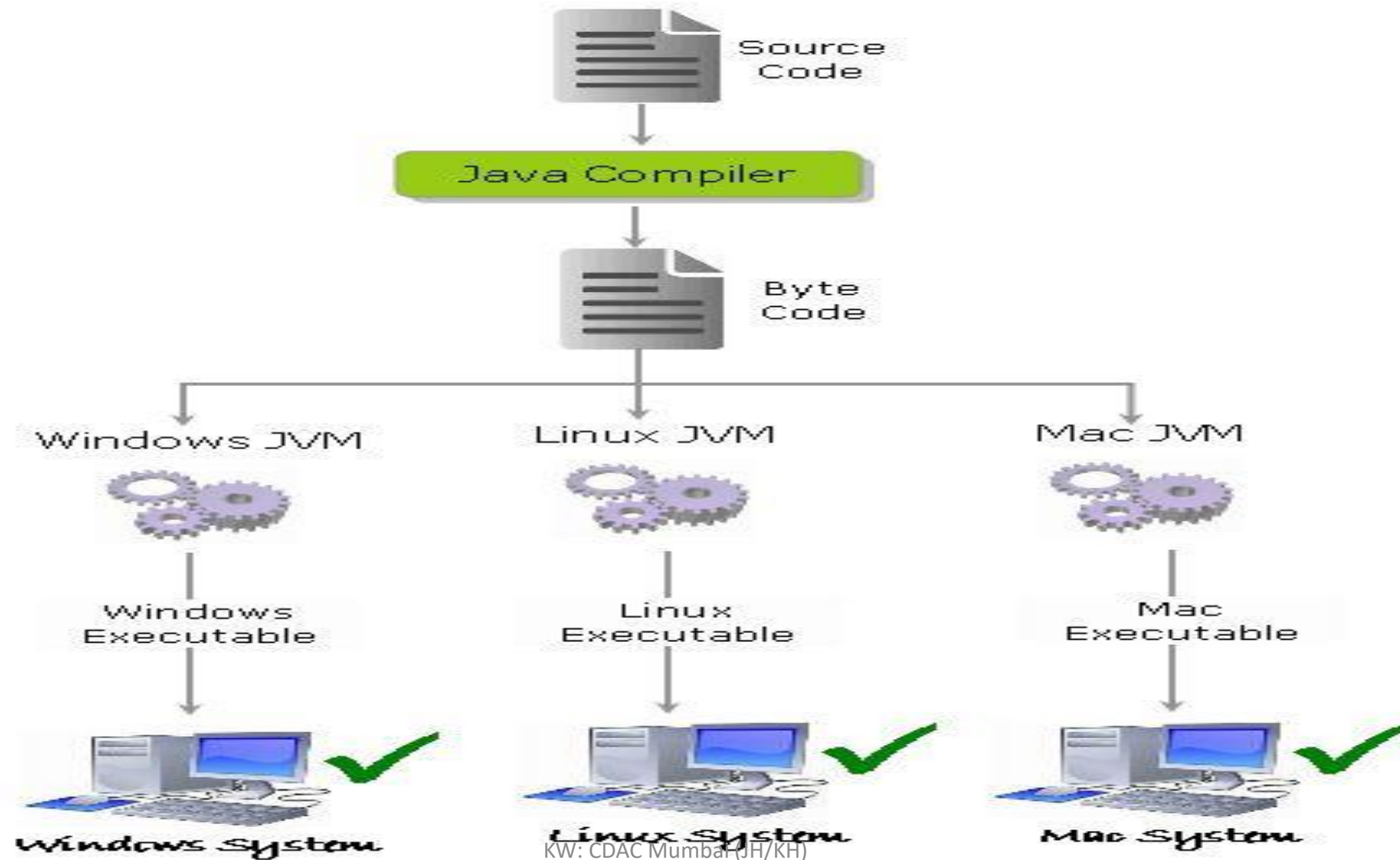
Output

Mouse Select Text Draw Stamp Who can

How Java is Platform-independent?



How Java is Platform-independent?



Understand JDK, JRE and JVM:

JDK : Java Development Kit

Mouse

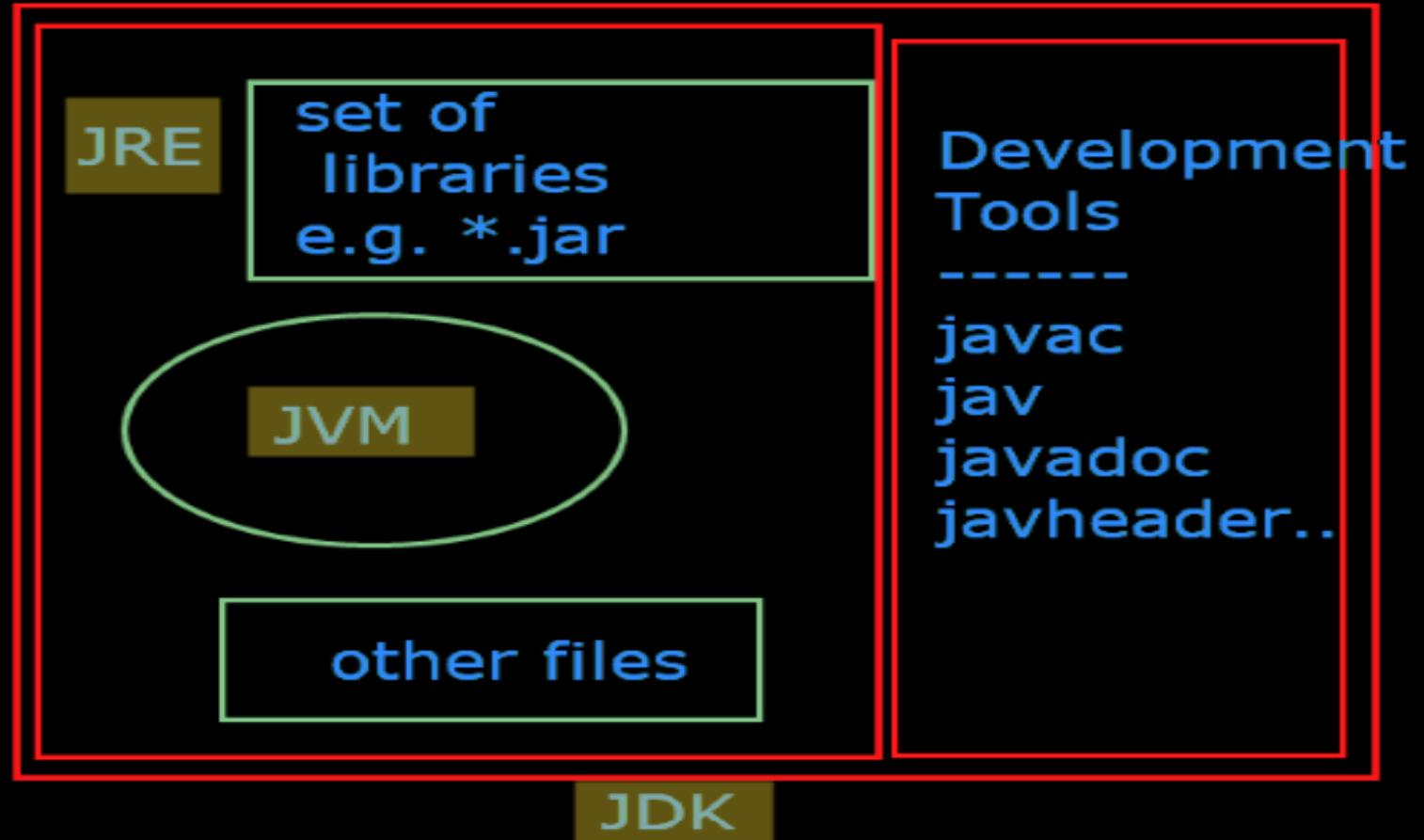
Select

Text

Draw

Stamp

Who can



Understand JDK, JRE and JVM:

JDK: Java Development Kit

JRE: Java Runtime Environment

JVM: Java Virtual Machine

- Loads code
- Verifies code
- Executes code
- Provide Runtime environment

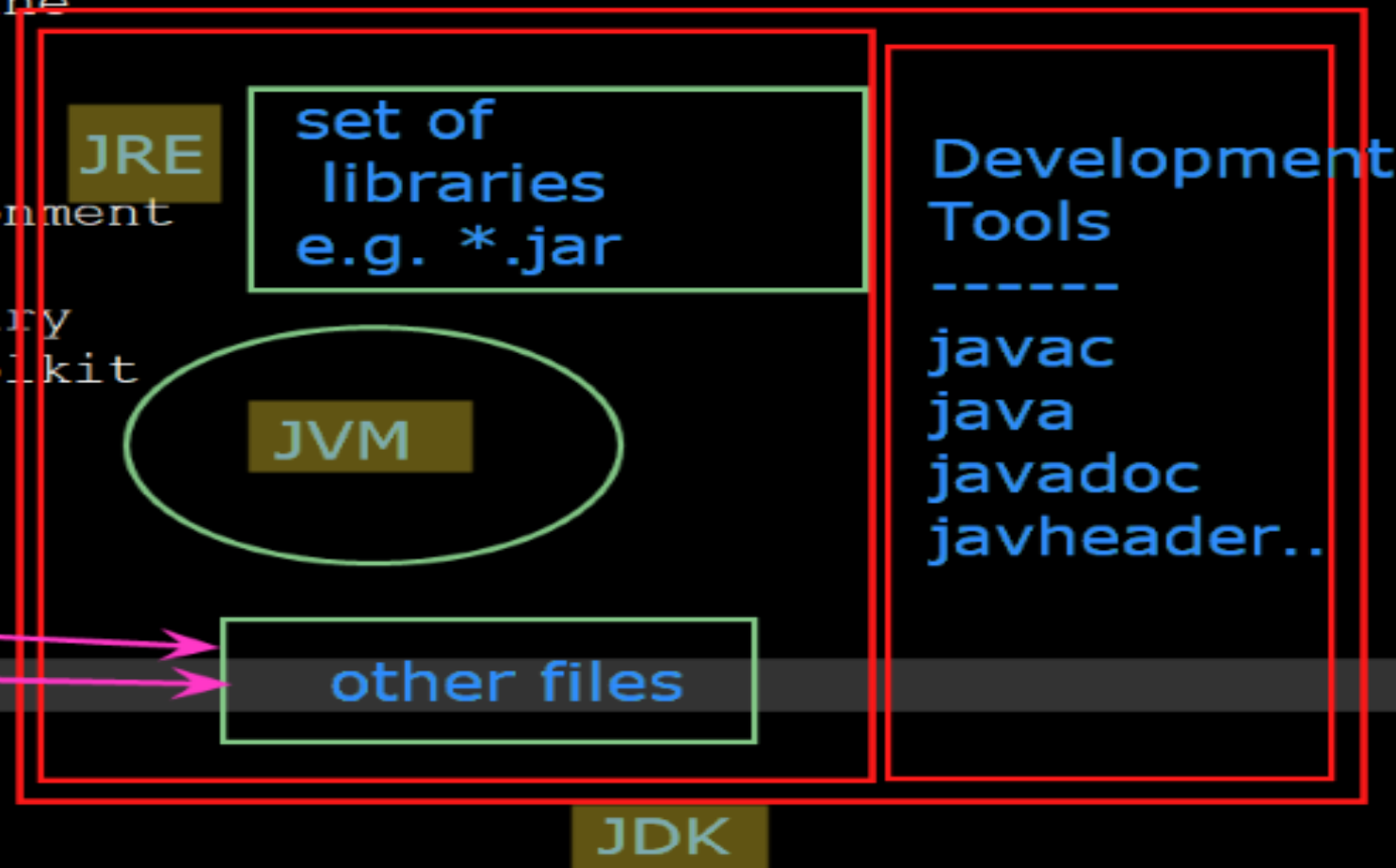
RCL: Runtime Class Library

UIT: User Interface Toolkit

- AWT tool kit
- Swing tool kit

Java Plugins

Java web Start



Mouse

Select

Text

Draw

Stamp

Who can

API: Application Programming Interface : Packages

Packages:

1. Inbuilt packages

2. User defined packages

Miniproject

In

Op

gr

Rg

M1:Input

M2: Operations

M3:Graph

M4:Report

classes: lang

classes: util

classes:io

inbuilt packages



Who can

Packages : Java Libraries, Middle-ware, and Database options

- java.lang
- java.util
- java.sql
- java.io
- java.nio
- java.awt
- javax.swing