



College of Computers and Information Technology
Department of Computer Science



CHAPTER-2

Introduction to Java

Contents

- ❑ What is Java ?
- ❑ Where is Java used ?
- ❑ Features of Java
- ❑ Java Program Translation
- ❑ Java Virtual Machine
- ❑ Java Program-Development phase

WHAT IS JAVA ?

- ❑ Java is Object Oriented Programming language as well as Platform.
- ❑ Java was developed by a team led by James Gosling at Sun Microsystems.
- ❑ Java is a first programming language which provide the concept of writing programs that can be executed using the web.

Java's History

- ❑ James Gosling and Sun Microsystems
- ❑ Oak
- ❑ Java, May 20, 1995, Sun World
- ❑ HotJava
 - ❑ The first Java-enabled Web browser
- ❑ Early History Website:

<http://www.java.com/en/javahistory/index.jsp>

WHERE IS JAVA USED ?

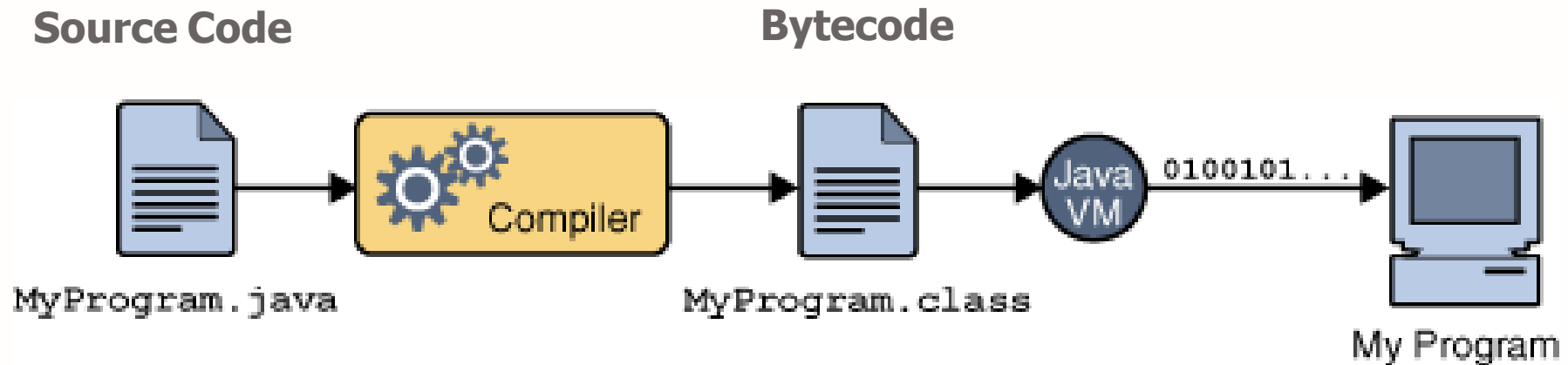
- ❑ According to the Sun , 3 billion devices run java. There are many devices where Java is currently used.
- ❑ Desktop Applications - Acrobat reader, Media player, Antiviruses etc.
- ❑ Web Applications - irctc.co.in , javatpoint.com etc.
- ❑ Enterprise Application – Banking Application, Business Application.
- ❑ Mobile.
- ❑ Embedded System.
- ❑ Games.
- ❑ Robotics

FEATURES OF JAVA

- ❑ Java is Simple.
- ❑ Java is Object Oriented
- ❑ Java is Distributed
- ❑ Java is Architecture Neutral
- ❑ Java is Robust
- ❑ Java is Interpreted and Compiled
- ❑ Java is Secure
- ❑ Java is Portable
- ❑ Java is Multi-Threaded

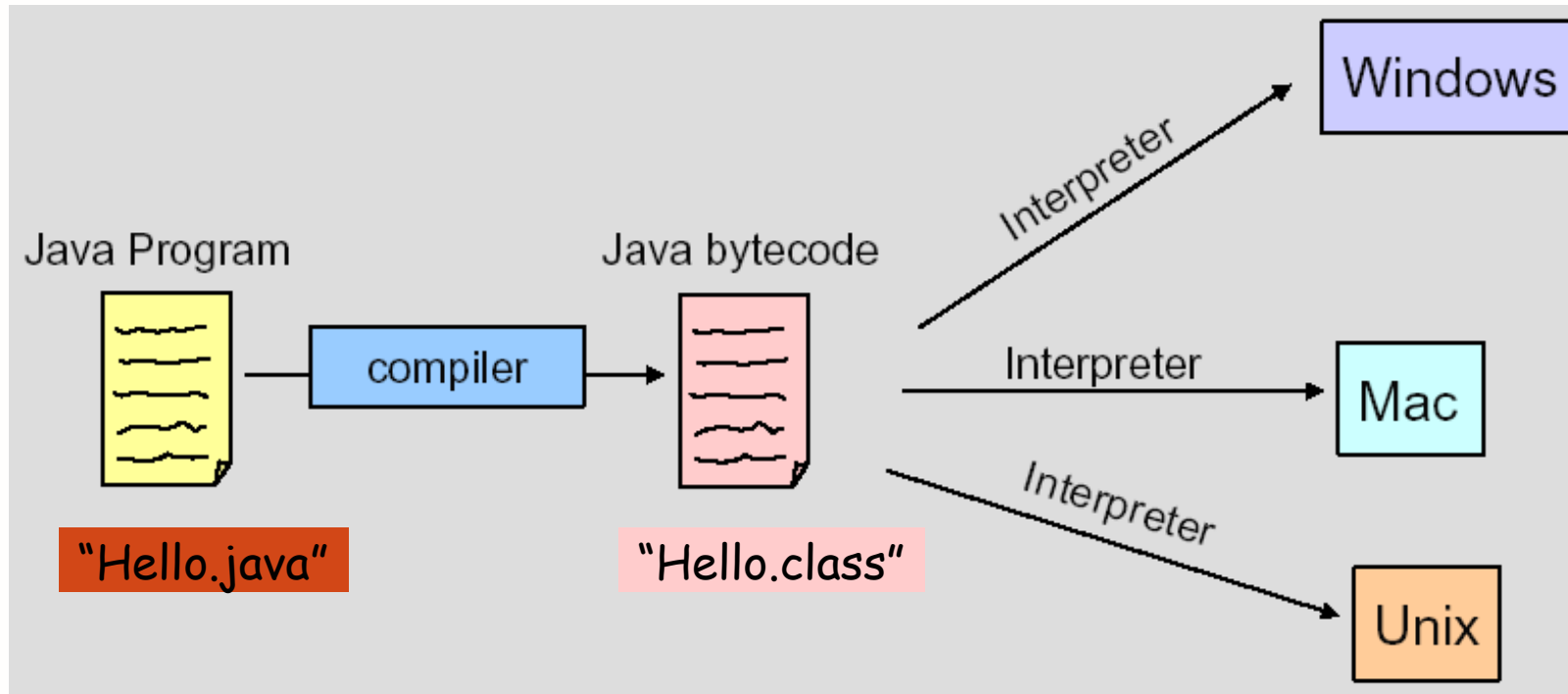
Compiling Java Programs

- The Java compiler produces **bytecode** (a. "class" file) not machine code from the source code (the ".java" file).
- **Bytecode** is converted into machine code using a **Java Interpreter**



Platform Independent Java Programs Compiling

You can run bytecode on an computer that has a Java Interpreter installed



JAVA VIRTUAL MACHINE

- ❑ Java virtual machine is the like usual computer which translate high level language into machine language.
- ❑ Just like that Java virtual machine also translate Bytecode into machine language.
- ❑ JVM are available for many hardware and software Platform.

The Java Virtual Machine Components

❑ The Class Loader

- stores bytecodes in memory

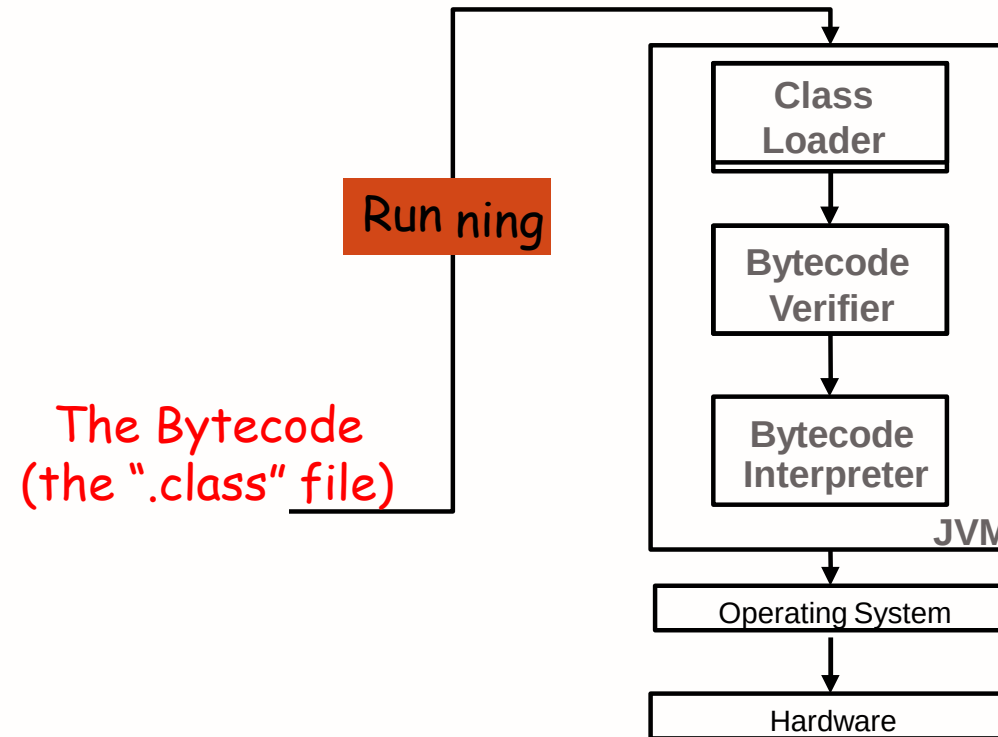
❑ Bytecode Verifier

- ensures bytecodes do not violate security requirements

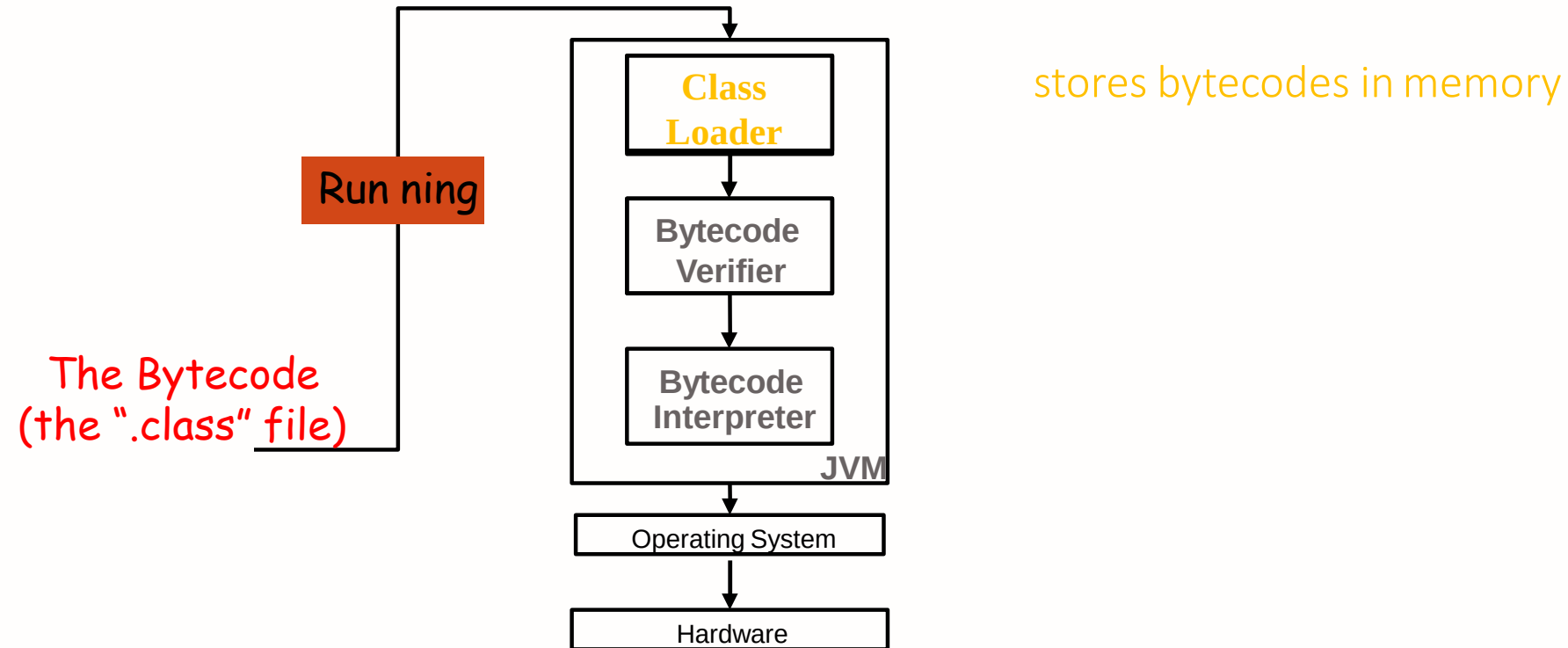
❑ Bytecode Interpreter

- translates bytecodes into machine language

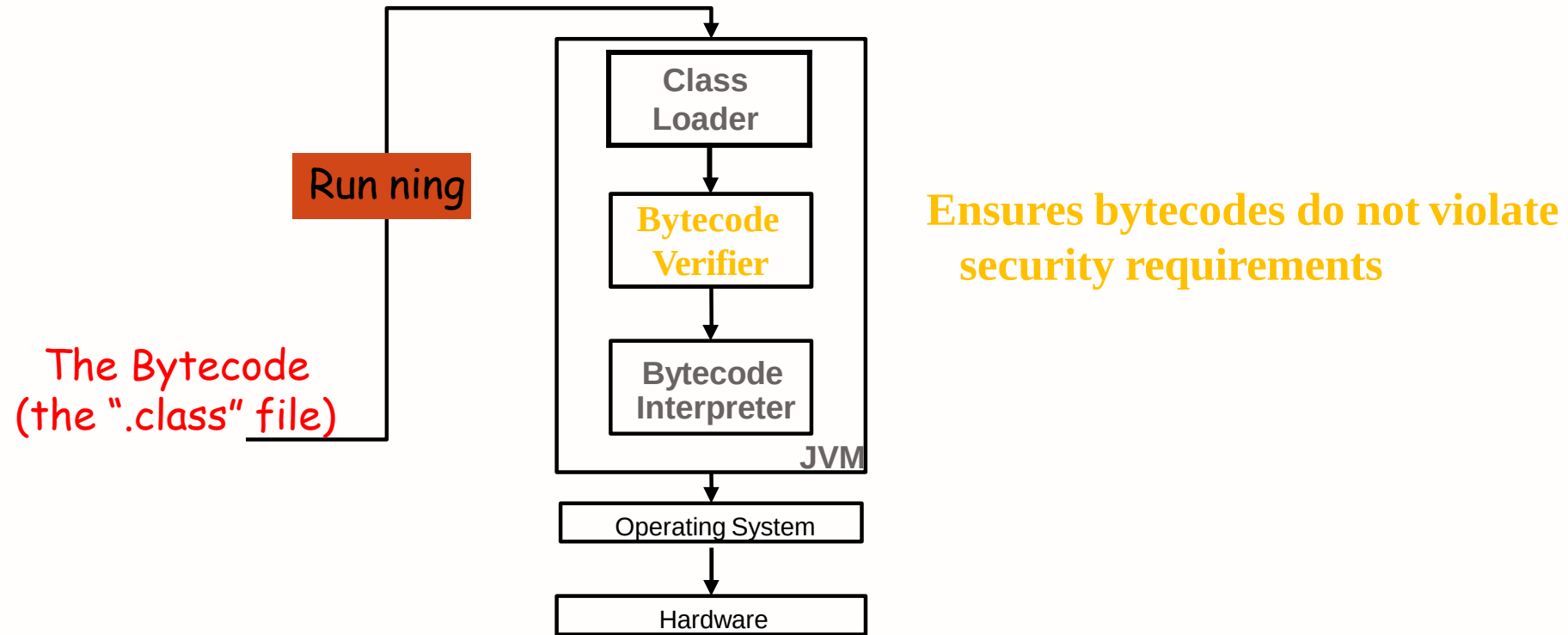
Running The Program



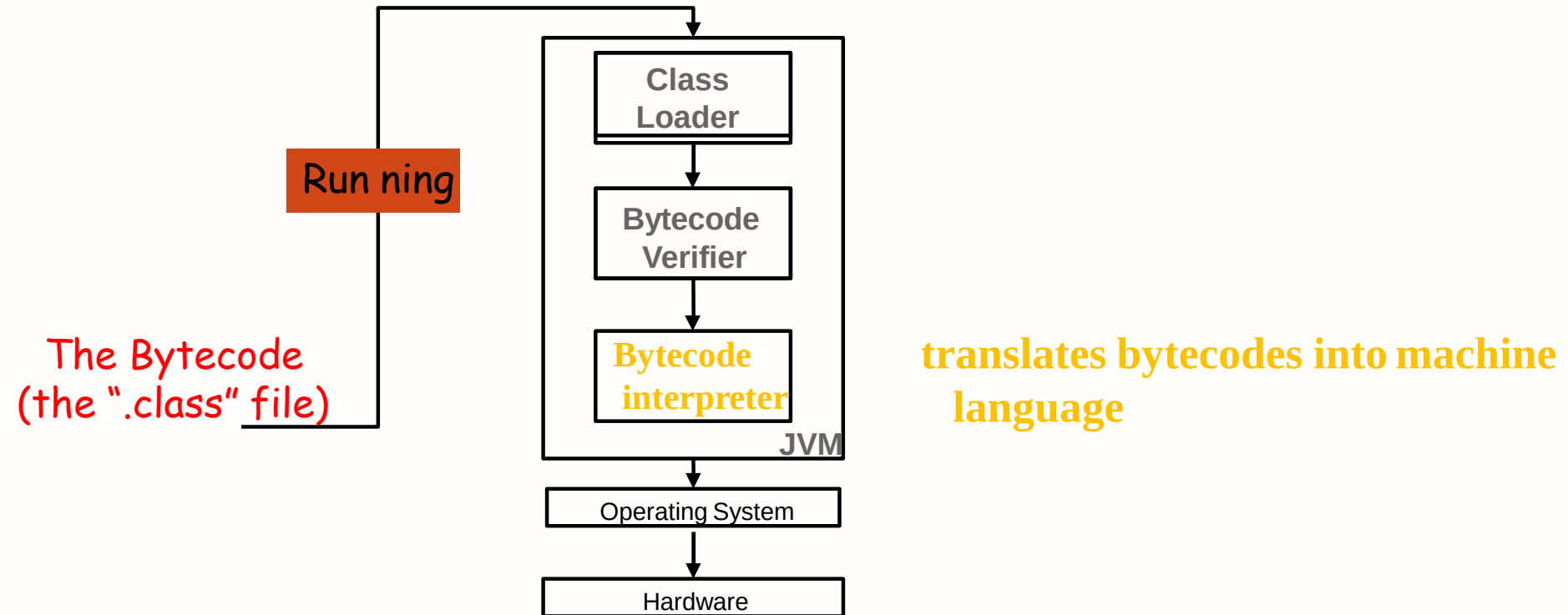
Running The Program



Running The Program



Running The Program



Testing and Debugging the Program

□ Testing

- Be sure that the output of the program conforms with the input.
- There are two types of errors:
 - **Logical Errors:** The program run but provides wrong output.
 - **Runtime errors:** The program stop running suddenly when asking the OS executing a non accepted statement (divide by zero, etc).

□ Debugging

- Find, Understand and correct the error

JDK Editions

- **Java Standard Edition (J2SE)**
 - **J2SE can be used to develop client-side standalone applications or applets.**
- **Java Enterprise Edition (J2EE)**
 - **J2EE can be used to develop server-side applications such as Java servlets, Java ServerPages, and Java ServerFaces.**
- **Java Micro Edition (J2ME).**
 - **J2ME can be used to develop applications for mobile devices such as cell phones.**

This book uses J2SE to introduce Java programming.

Popular Java IDEs

- **NetBeans**
- **Eclipse**

