

# Introduction to Java Technology

# Contents

- History of Java
- What is Java?
- Java Platforms
- Java Virtual Machine (JVM)
- Java Development Kit (JDK)
- Benefits and Features of Java

# Objectives

- Discuss a brief history of Java
- Define Java
- Differentiate Java Platforms
  - J2EE
  - J2SE
  - J2ME
- Describe the Java Virtual Machine (JVM )
- Explain the contents of the Java Development Kit (JDK)
- Describe benefits and features of Java

In 1990, Sun Microsystems began an internal project known as the ***Green Project*** to work on a new technology.

In 1992, the Green Project was spun off and its interest directed toward building highly interactive devices for the cable TV industry. This failed to materialize.

In 1994, the focus of the original team was re-targeted, this time to the use of Internet technology. A small web browser called ***HotJava*** was written. Oak was renamed to ***Java*** after learning that Oak had already been trademarked.

In 1995, Java was first publicly released.

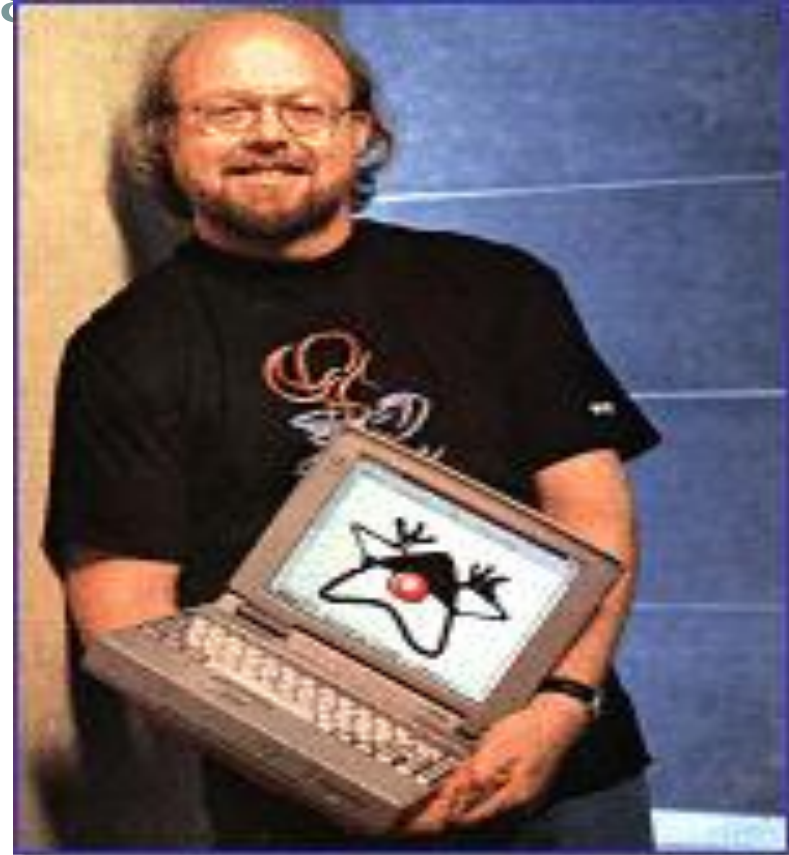
In 1996, Java Development Kit (***JDK***) 1.0 was released.

In 2002, JDK 1.4 (codename *Merlin*) was released, the most widely used version.

In 2004, JDK 5.0 (codename *Tiger*) was released, the latest version.

# 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
- He is currently the Chief Technical Officer of Sun Microsystems



# Java Quick Facts

- 4.5 million Java developers, the largest community of software developers
- 75% of professional developers in the world use Java
- 1.75 billion devices run in Java
  - 825 million Java-enabled smart cards
  - 579 million Java-enabled mobile devices
  - 635 Java-enabled phone models
  - 700 million desktops with Java software
- 220,000 downloads of JDK 1.1 in just 3 weeks, 2 million after a year
- 2 million downloads for J2EE SDK
- JavaOne draws 20,000 becoming the world's largest developer conference
- Over 400 Java user groups established worldwide
- Java runs on consumer and embedded devices more than any other software
- The software that powers the Mars Rover

# What is Java?

- A multi-platform, network-centric, object-oriented programming language
  - Multi-platform
    - ✦ It can run on almost any computer platform
  - Network-centric
    - ✦ Designed with network in mind – “the network is the computer”
    - ✦ Designed for building applications for the Internet
  - Object-oriented
    - ✦ It incorporates object-oriented programming model

# Java Platform Editions

A Java Platform is the set of APIs, class libraries, and other programs used in developing Java programs for specific applications

There are 3 Java Platform Editions

1. **Java 2 Platform, Standard Edition (J2SE)**

- Core Java Platform targeting applications running on workstations

2. **Java 2 Platform, Enterprise Edition (J2EE)**

- Component-based approach to developing distributed, multi-tier enterprise applications

3. **Java 2 Platform, Micro Edition (J2ME)**

- Targeted at small, stand-alone or connectable consumer and embedded devices



# Java Development Kit (JDK)

## Java Development Kit (JDK)

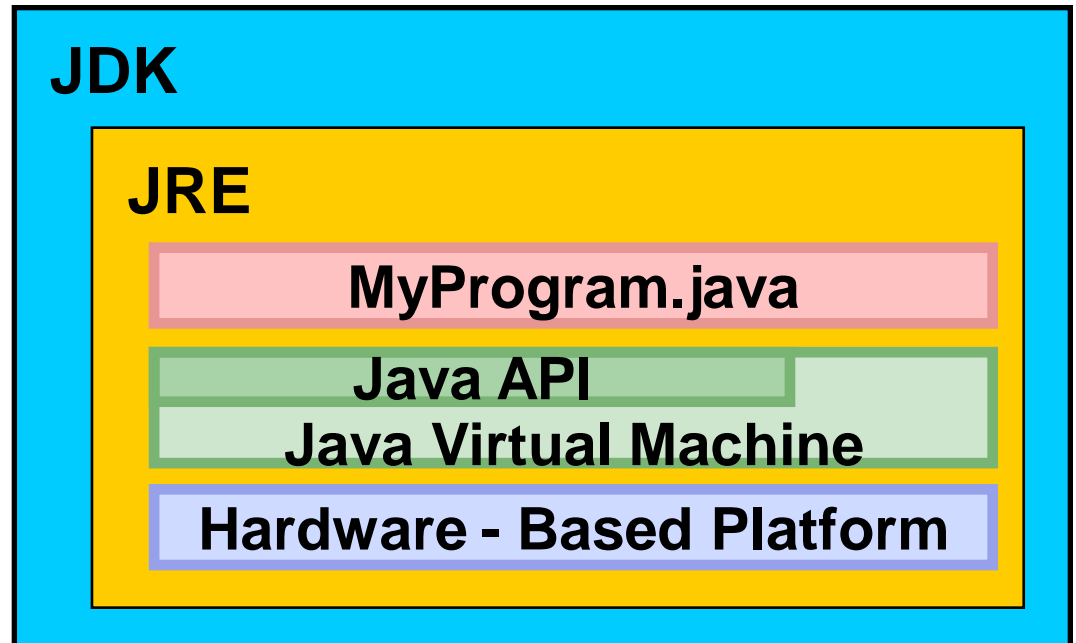
- Is a set of Java tools for developing Java programs
- Consists of Java API, Java Compiler, and JVM

## Java Application Programming Interface (API)

- Is prewritten code, organized into packages of similar topics

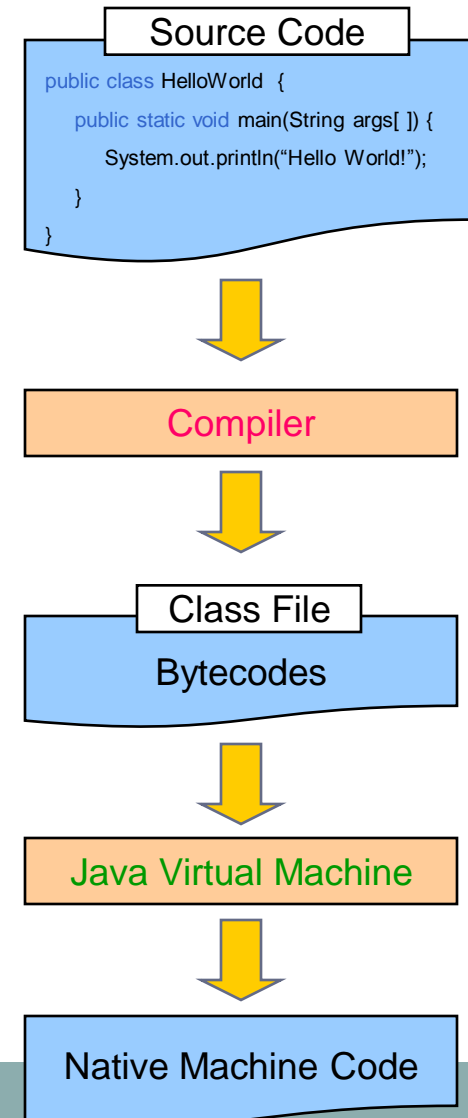
## Java Virtual Machine (JVM)

- Is an execution engine that runs compiled Java byte code



# How does JVM work?

- A Java program is written
- The program is compiled
- A *class file* is produced containing *bytecodes*
- The bytecodes are interpreted by the JVM
- The JVM translates bytecodes into native machine code



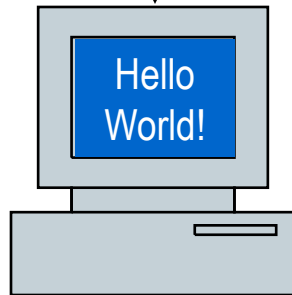
# Running on Different Platforms

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

**Java Program**

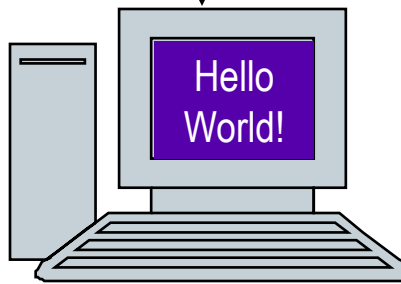
**Compiler**

**Interpreter**



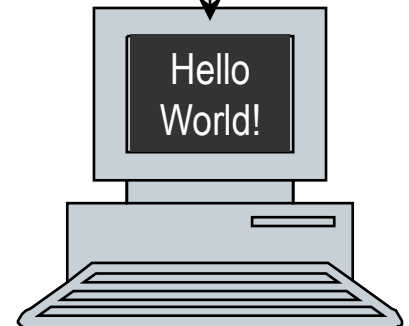
**Win32**

**Interpreter**



**Solaris**

**Interpreter**



**MacOS**

# Key Benefits & Features of Java

- **Write Once, Run Anywhere**

- Java is portable and platform independent

- **Network-centric**

- Can work with resources across a network and multi-tier architectures

- **Object-oriented**

- A Java program models a set of objects interacting with each other

- **Robust**

- Strong type checking
- Exception handling mechanism
- Automatic memory management

- **Multithreaded**

- A Java application can run several different processes called “threads” simultaneously

- **Security**

- Can download remote code over a network and run it in a secure environment
- Security levels and restrictions are highly configurable

## Summary

- Java is multi-platform, network-centric, object-oriented programming language.
- James Gosling is the inventor of Java.
- There are three platforms of Java: J2SE, J2EE, J2ME.
- JDK is a set of tools for developing Java applications.
- JVM interprets Java programs and allows them to run on any platform.
- Java is portable, robust, multithreaded, and secured.