



Java Object-Oriented Programming



Topics

- What is Java?
 - An object-oriented programming language developed by Sun Microsystems
 - Also a platform to support Java applications

- Where is it used?
 - Desktop standalone applications
 - Web applications
 - Embedded applications
 - Everywhere -
<http://www.java.com/en/everywhere/>

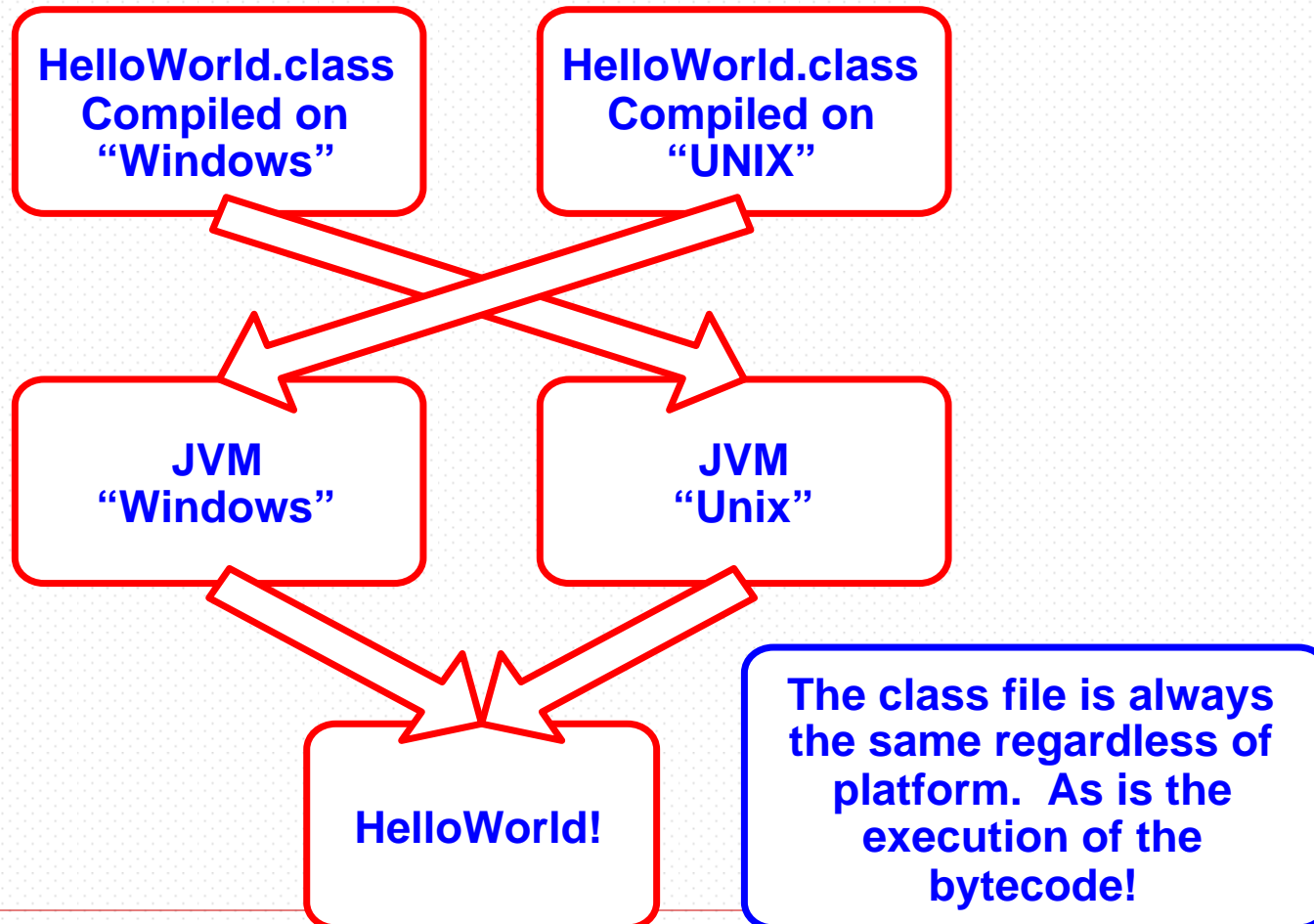


Major Features

- ❑ *Object-oriented*
- ❑ *Architecture neutral (platform independent)*
- ❑ *Interpreted*
- ❑ API
- ❑ Distributed, Portable, High performance, Simple, Robust and Powerful, Dynamic, Secure



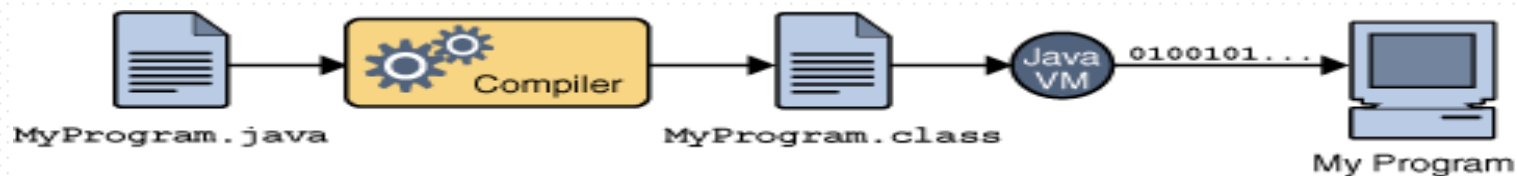
Platform Independence





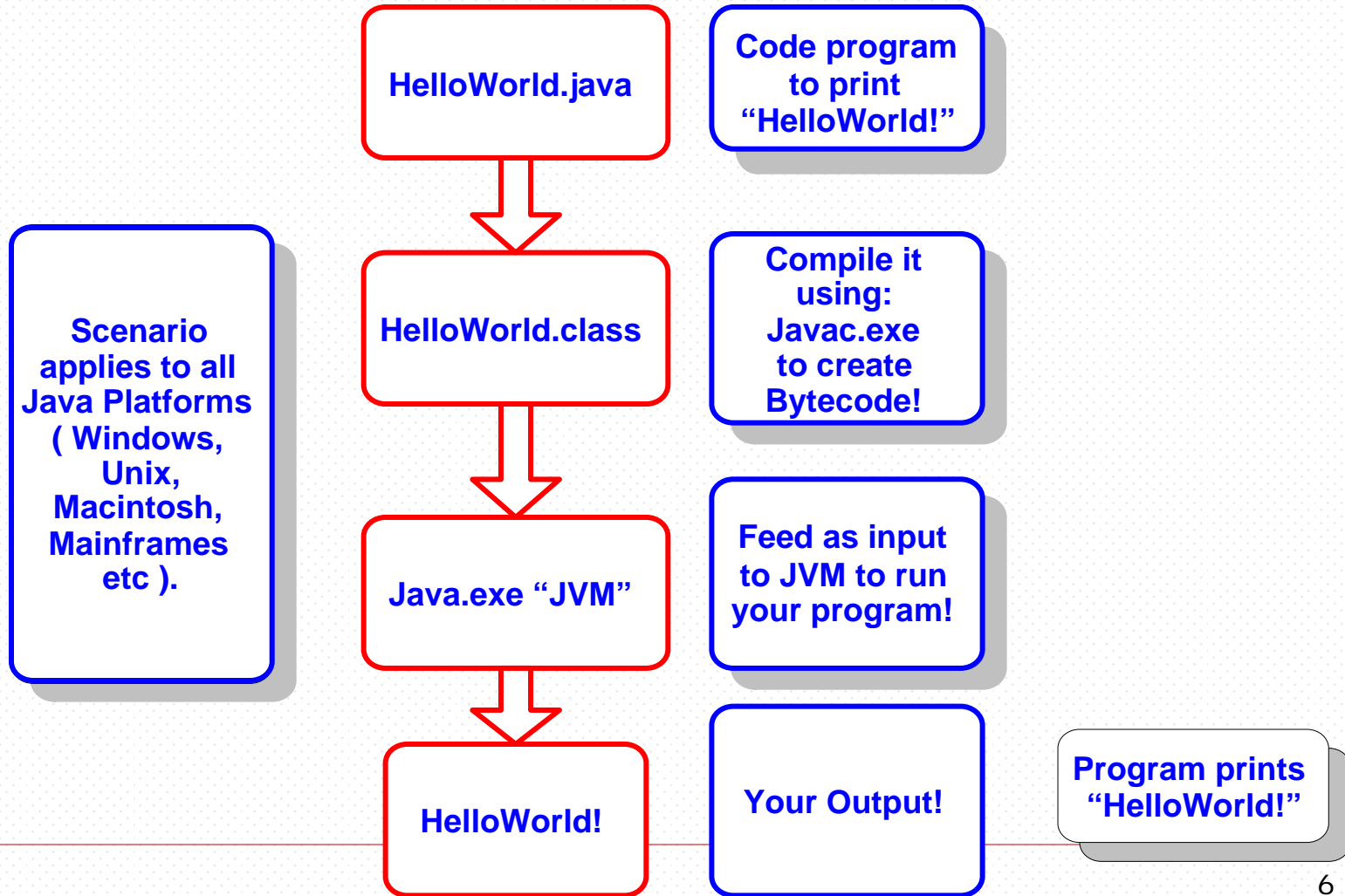
How does Java work?

- Bytecode
- Java Virtual Machine (JVM)





Compiling and Running





Java Syntax

- Create code comments.
- Declare basic data types.
- Describe industry standard naming conventions.
- Employ various operators.
- Describe variable scope.
- Code basic control statements (for, while, do)
- Declare and use Arrays.
- Passing parameters to main().



Comments

- Two ways to comment in Java:
 - Single Line Comment

```
int states = 50; // current number of states
```

- Multiple Line Comment

```
/* This code computes the total amount due by the  
customer including applicable interest, late fees  
and principal by the next due date */  
float amountDue = principal + latefees + interest;
```



Data types

- Java supports 8 basic data types known as **Primitive Types**.
 - Four Integer types
 - Two real (or floating-point) types
 - A boolean type
 - A character type
- Java also supports class and array data types (collectively known as **Reference types**), which will be discussed later.



Primitive Types – Integers

Keyword	Size	Min value	Max value
byte	8-bit	-128	127
short	16-bit	-32768	32767
int	32-bit	-2147483648	2147483647
long	64-bit	- 9223372036854775808	9223372036854775807

- byte b = 100;**
- short s = 24000;**
- int i = 1234567;**
- long big = 1234567890123456L;**



Primitive Types – Boolean/char

Keyword	Size or Format	Description
<code>boolean</code>	true/false	true or false
<code>char</code>	16-bit Unicode	A single character \u0000 - \uFFFF

- ❑ `boolean b = true;`
- ❑ `char myChar = 'a';`



Strings

- ❑ A String represents a group of characters.
- ❑ String is not a primitive type, it is a Java class.
- ❑ Strings can be used like primitive types in many ways.
 - Assign literal values or Add Strings together

```
System.out.println("Joe");  
String name = "Joe";  
System.out.println(name);  
String fullName = name + " Thomas";
```

- ❑ We'll discuss String in detail later.



Variable Naming Conventions

- ❑ Variables **must** start with a letter, a dollar sign (\$), or an underscore (_).
- ❑ Followed by any of the above characters and/or numbers.
- ❑ Can be any length.
- ❑ Avoid short abbreviations - your tools will do most of the typing for you!



Naming Conventions cont

- ❑ Variables cannot be a Java keyword, or any Java reserved keyword.
- ❑ *By convention*, begin with a lowercase letter and no separating character between words (also called the title case rule).
- ❑ Each following word starts with a capital letter.

`myVariableName`

```
int max = 100;  
short conferenceRoomCapacity = 500;  
float totalSalesByDivision = 12345678.90f;  
boolean isGoodCustomer = true;
```



Java and Case-Sensitivity

Java is a case sensitive language. 'result' and 'Result' are different variables.

```
int result = 123;  
int Result = 123; // don't do this!
```

REMEMBER: Everything in Java is CASE sEnSiTiVe.



Java Statements

- Each Java statement ends with a ";".

```
int salary;  
char ind;
```

- It is permitted to have two or more statements on a single line, but it is not recommended.

```
int x = 0; int y = 1;
```



Find the Defect 1

- There is an naming convention mistake in the following program. Can you find it?

```
public class MyClass {  
    public static void main(String args[])  
    {  
        String Name = "Bob";  
        System.out.println( name );  
    }  
}
```



Find the Defect 2

- There is one syntax error in the following code. Can you find it?

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



Find the Defect 3

- There are two syntax errors in the following code. Can you find them?

```
public class MyClass {  
    public static void main(String args[])  
    {  
        system.out.println("Hello there!")  
    }  
}
```



Eclipse break



Lab #1

- Edit your HelloWorld program to practice declaring and using Java primitive types.
 1. declare an int named age, assign it a value.
 2. declare a double named d, assign it a value.
 3. declare a boolean named isCrazy, assign it a true value.
 4. declare an char named exclaim, assign it a value '!'.
!
 5. declare a string named name, assign it your name.
 6. Create a print statement that outputs:

Hello Lori, You are 18 years old!