Chapter 1 Java Fundamentals

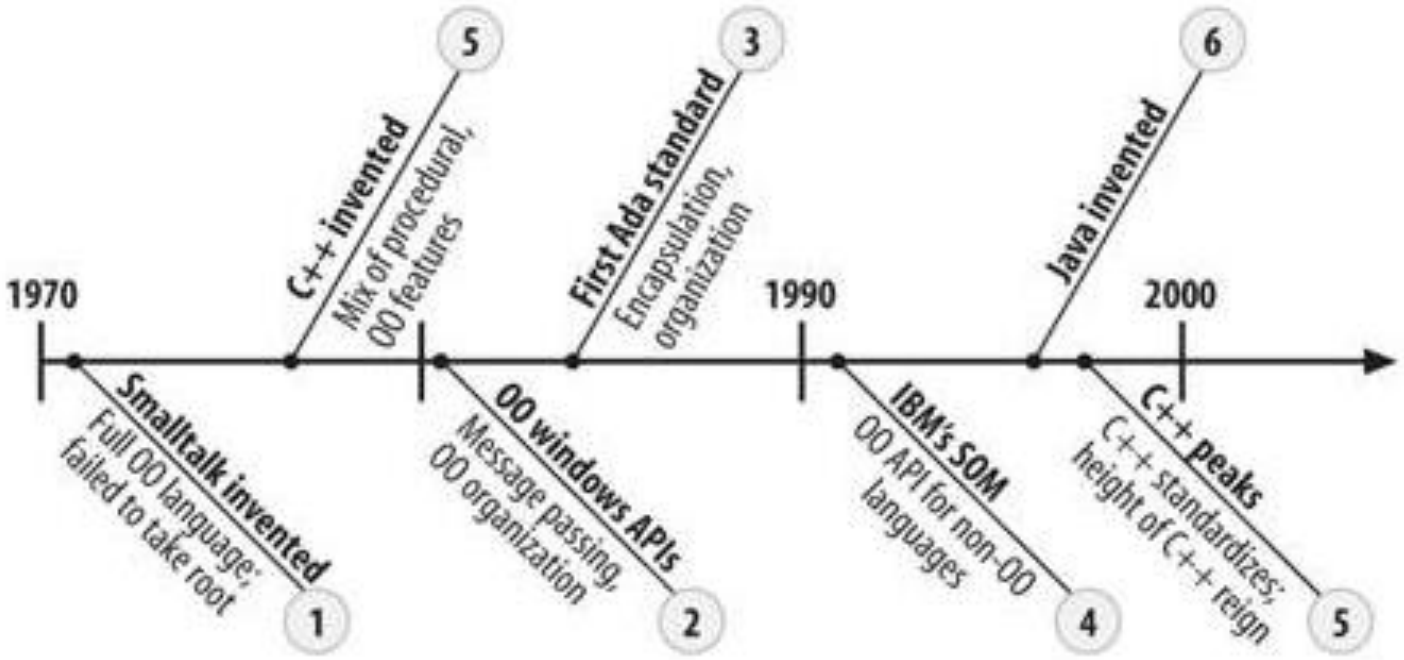
XIANG ZHANG

JAVACOSE@QQ.COM

Content

- Evolution of Java
- JDK and JRE
- Java Operating Mechanism
- Java Developing Environment
- Java Primary Data Types
- Java Basic Grammar

Evolution of Java – Success of OOP



from《Beyond Java》

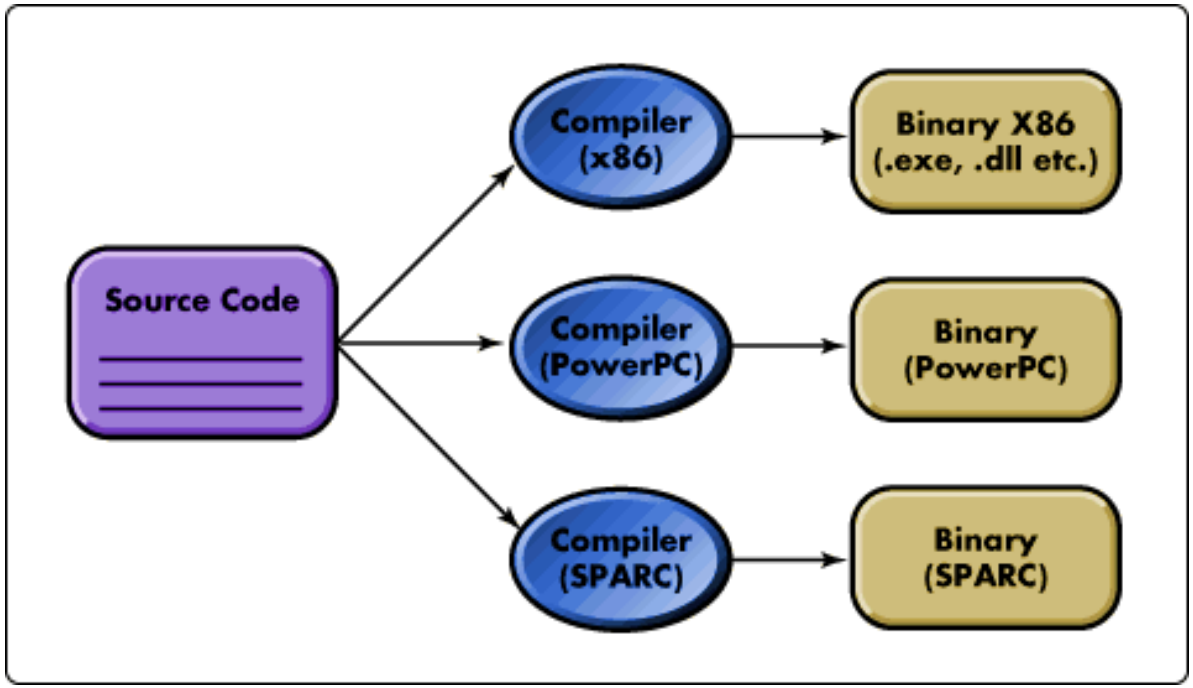
Evolution of Java – Life of Java

- Past
  - Resource-limited Device
  - C++
  - Green Project
  - Oak
  - Mosaic / Mark Andreessen
  - HotJava
- Present
  - Internet / WWW
- Future
  - Sun与Microsoft
  - Java与开源
  - Java与Oracle

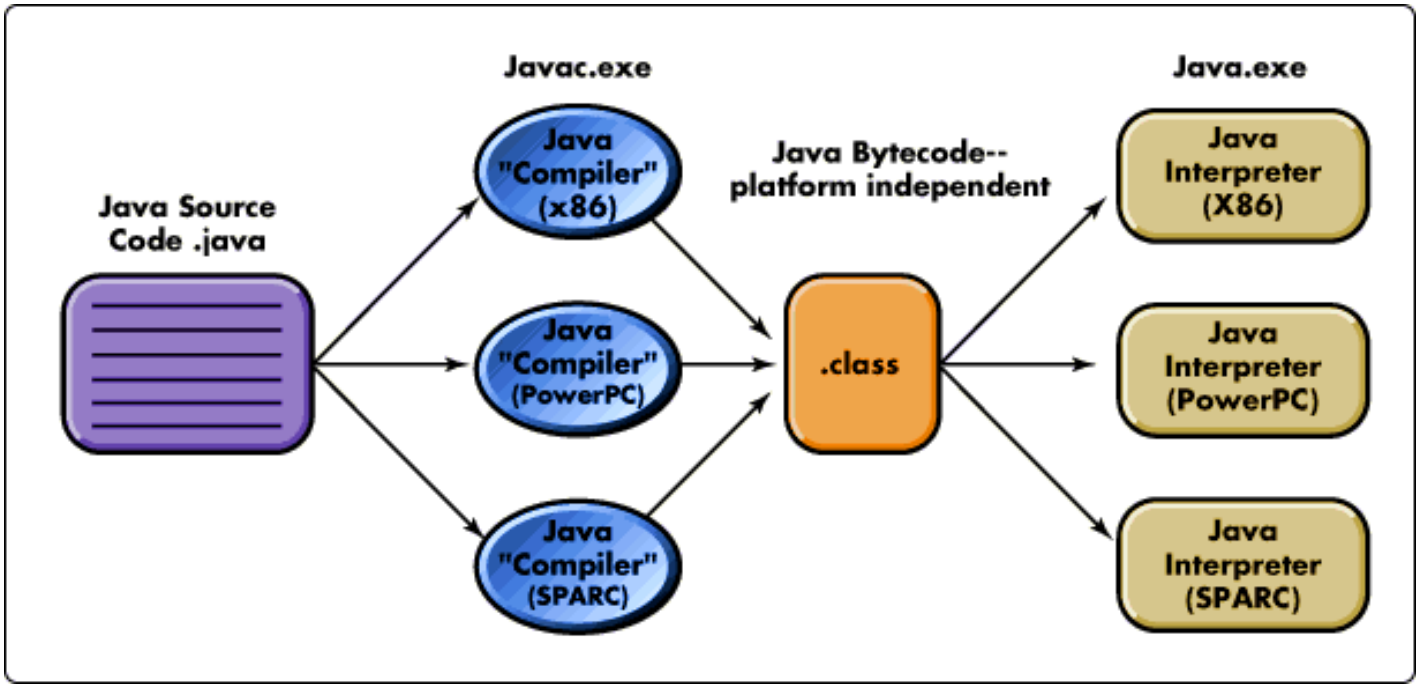
JDK and JRE

- JDK – Java Development Toolkit
  - J2SE – Java 2 Standard Edition
  - J2EE – Java 2 Enterprise Edition
  - J2ME – Java 2 Micro Edition
- JRE – Java Runtime Environment

Java Mechanism – Traditional

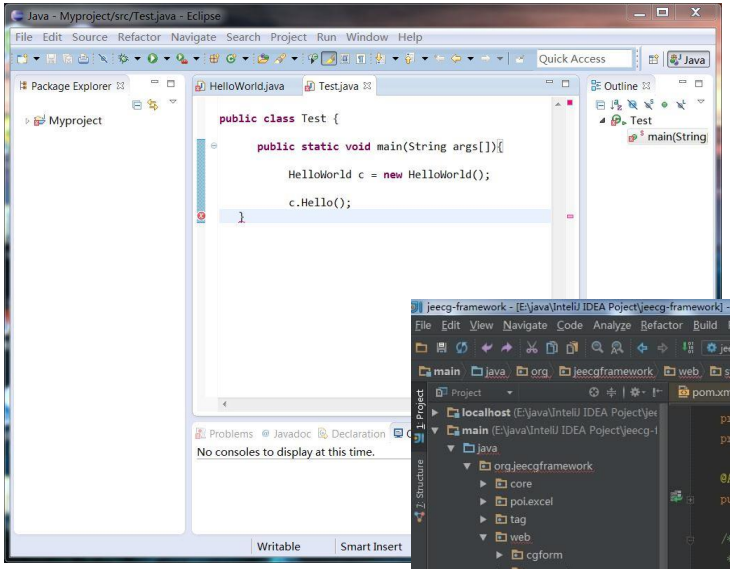


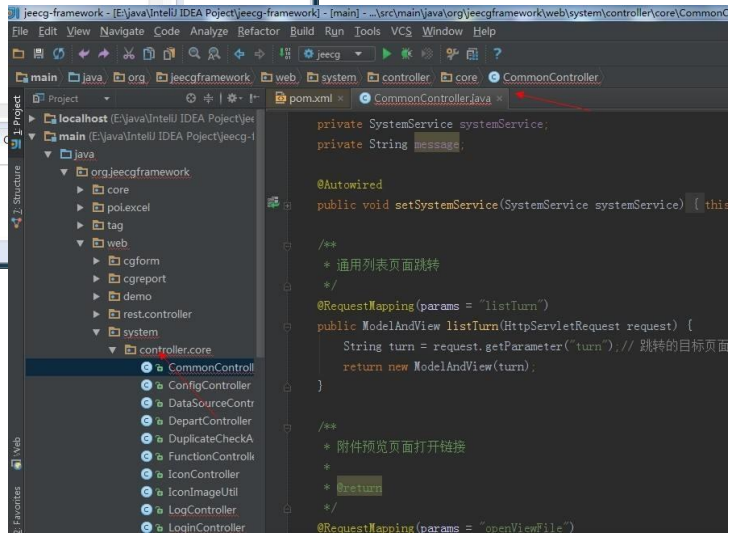
Java Mechanism – Java



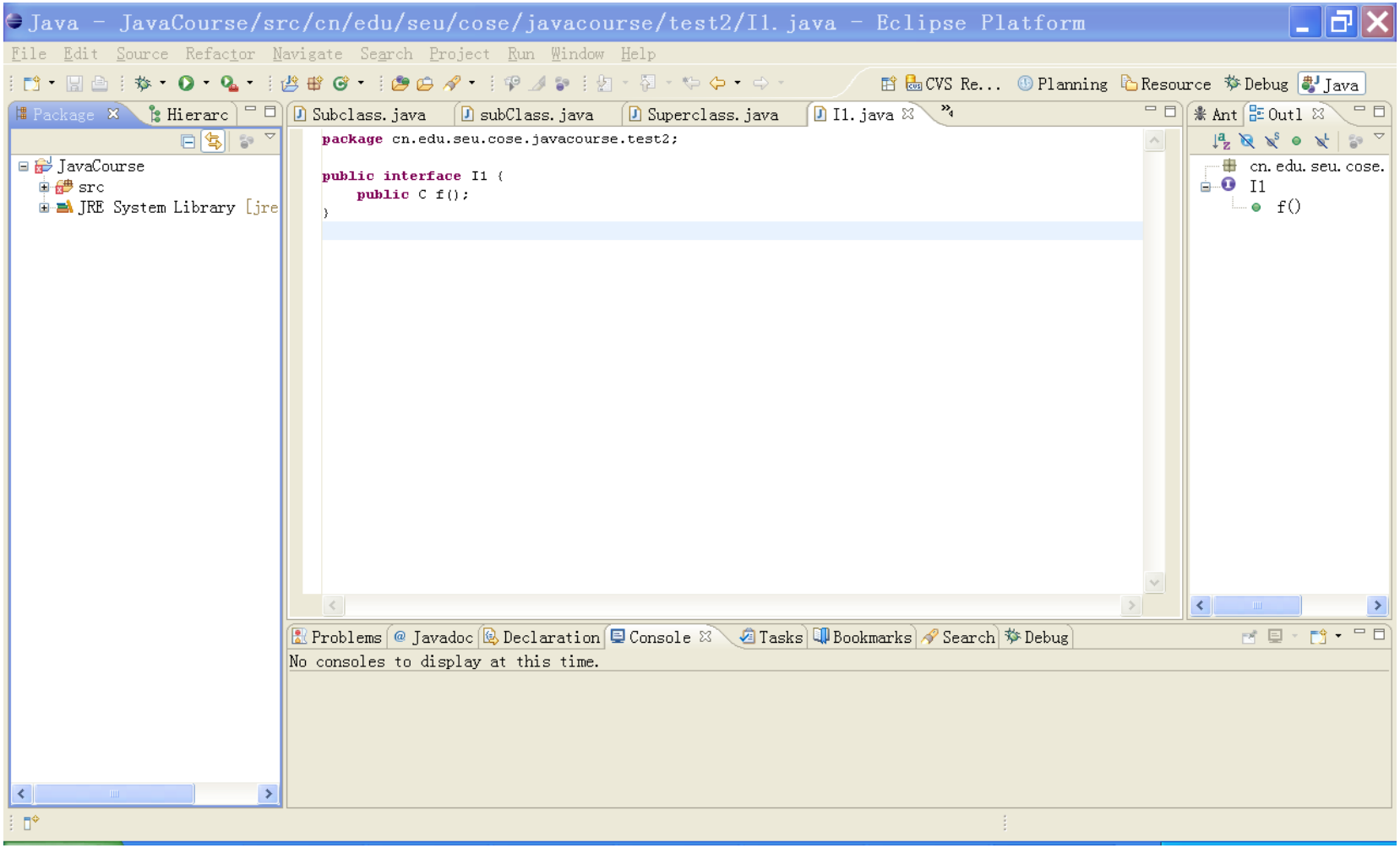
Java Developing Environment

- Text editor
- IDE
  - Eclipse
  - IntelliJ IDEA
  - Netbeans
  - MyEclipse





Eclipse


Java - JavaCourse/src/cn/edu/seu/cose/javacourse/test2/I1.java - Eclipse Platform
File Edit Source Refactor Navigate Search Project Run Window Help
CVS Re... Planning Resource Debug Java
Package Hierarc
JavaCourse
src
JRE System Library [jre
Subclass.java subClass.java Superclass.java I1.java
package cn.edu.seu.cose.javacourse.test2;
public interface I1 {
public C f();
}
Ant Outl
cn.edu.seu.cose.
I1
f()
Problems Javadoc Declaration Console Tasks Bookmarks Search Debug
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Java Features

- Simplicity: simple grammar, rich library
- Pure OO: everything is object!
- Security: memory access, garbage collection, exception
- Portability: Java Virtual Machine
- Interpreted execution: Bytecode

Exploring Java


```
package cn.edu.seu.cose.javacourse.ch01;
public class Person {
	private String name;
	private int age;
	public Person(String name, int age){
		this.name = name;
		this.age = age;
	}
	public void greet(){
		System.out.println("Hello, I am " + name
			+ " , and I am " + age + " years old");
	}
	public static void main(String[] args){
		Person tom = new Person("Tom", 18);
		tom.greet();
	}
}
```

Java Primary Data Types

Java Primary Data Types

Type	size(bit)	range	wrapper
boolean	1	true/false	Boolean
char	16	Unicode	Character
byte	8	[-128, 127]	Byte
short	16	$[-2^{15}, 2^{15}-1]$	Short
int	32	$[-2^{31},2^{31}-1]$	Integer
long	64	$[-2^{63},2^{63}-1]$	Long
float	32	$3.4*10^{38}$	Float
double	64	$1.7*10^{308}$	Double
void			Void

Conversion Between Values

- From Low Accuracy to High Accuracy: Auto
  - double d = 10;
- From High Accuracy to Low Accuracy: Cast
  - int t = (int)10.2;

Primary Types and Wrapper

- Values of Primary Types are NOT Objects!
- Each Primary type has a corresponding wrapper to wrap a value into an object:
  - Integer a = 473;
  - System.out.println(a.compareTo(new Integer(472)));
  -

Print and Format

- System.out.println()
- String Formatter

```
double pi = 3.1415926;
String result = String.format("%.2f", pi);
System.out.println(result);
// print pi with specific digits of fractional part
```

Variables and Constants

- Declare and use

```
int a = 10;
final int b = 20;
```

- Lifecycle and Hidden Variables

```
public class Test {
    int t = 0;
    public void hideT(){
        int t = 10;
        int s = 9;
        System.out.println(t);
    }
    public void printT(){
        System.out.println(t);
    }
}
```

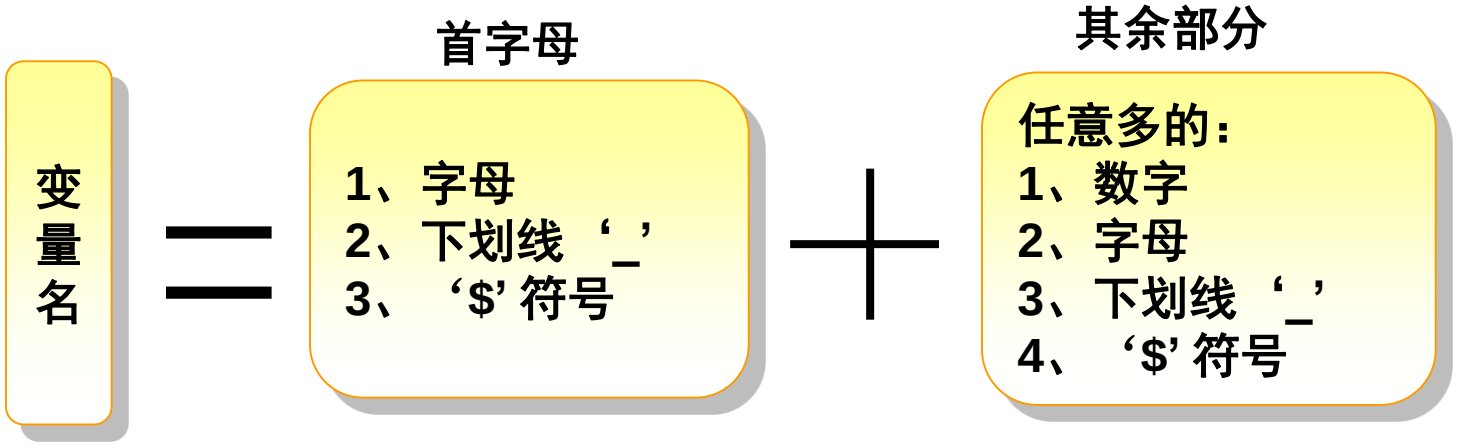
Notice!

- Different with C++

```
int i = 0;
for(int j=0; j<10; i++){
    int i = 10; //编译出错
}
```

Naming of Variables

- Principle:
  - A names should reflect the meaning of a variable
  - Precise
  - First letter in lower case (different with classes)



Java Operator

- Arithmetic operator
- Comparison operator
- Logical operator
- Bitwise operator
- Assignment operator
- Others

Arithmetic Operator

- +、-、*、/、%
- ++、--

Comparison Operator

- > 、 >=
- < 、 <=
- == 、 !=
- instanceof

```
Person tom = new Person("Tom", 18);
System.out.println(tom instanceof Person);
```

Logical Operator

- &、|
- &&、||
- !
- ^

Bitwise Operator

- <<
- >>
- >>>

Assignment Operator

- =
- +=、-=、*=、/=、%=
- >>=、<<=、>>>=

Others

- ? :
- .
- new
- []

Java Grammar

- Package
- Import
- Class
- Field
- Method

```
package cn.edu.seu.cose.javacourse.test;

public class Person {

    private String name;
    private int age;

    public Person(String name, int age){
        this.name = name;
        this.age = age;
    }

    public void greet(){
        System.out.println("Hello, I am " + name
                + " , and I am " + age + " years old");
    }

    public static void main(String[] args){
        Person tom = new Person("Tom", 18);
        tom.greet();
    }
}
```

Java Statement

- if-else
- switch
- while、do-while
- for
- break
- continue
- return

Java Keywords


```
abstract
assert
boolean
break
byte
case
catch
char
class
const
continue
default
do
double
else
enum
extends
false
final
finally
float
for
goto
if
implements
import
instanceof
int
interface
long
native
new
null
package
private
protected
public
return
short
static
strictfp
super
switch
synchronized
this
throw
throws
transient
true
try
void
volatile
while
```

Java Comments


```
//   This is a simple lined comment

/*   This is a multiple lined comment
 *   This is a multiple lined comment
 *   This is a multiple lined comment
*/

/**
 * @param age
 * @return
 */
    public int count(int age){
        return 0;
    }
```

Self-teaching

- Javadoc
  - What is Javadoc ?
  - How to add comments in program for making a Javadoc?
  - How to generate Javadoc in HTML format ?
  - How to search in Javadoc ?

Forecast

- OO Concepts
- Class and Objects
  - Package
  - Field
  - Method
  - Main method
  - Object
  - Construct and Initialization
  - Access Control