

# Class

## Java

Java " Class " Java ByteCode  
Java Class

# Class

Class Class

Class 8

# Class

Class Class Class  
Class C  
u1 u2 u4 u8 1 2 4  
8  
UTF-8

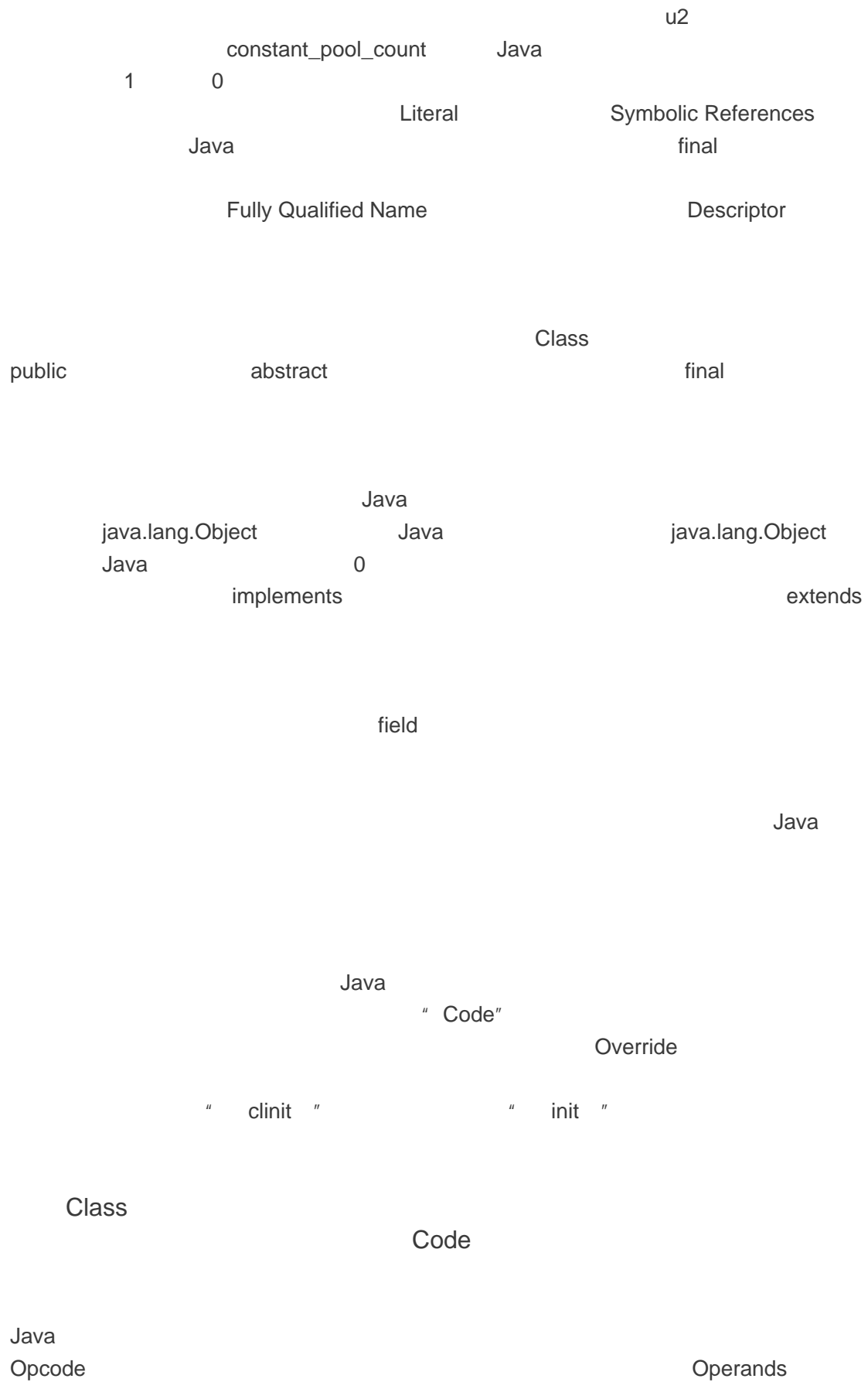
info" Class

# Class

Class XML

# Class

Class 4 Magic Number  
Class  
4 Class 5 6  
MinorVersion 7 8 Major Version Java  
45 JDK 1.1 JDK  
Class  
Class  
Class



Java 0 255  
256

iload int fload  
float  
byte char short boolean  
boolean byte short char  
int  
**Java**

iload iload\_ n lload lload\_ n fload fload\_  
n dload dload\_ n aload aload\_ n  
istore istore\_ n lstore lstore\_ n  
fstore fstore\_ n dstore dstore\_ n astore astore\_ n  
bipush sipush ldc ldc\_w ldc2\_w aconst\_null  
iconst\_m1 iconst\_ i lconst\_ l fconst\_ f dconst\_ d  
wide

iadd ladd fadd dadd  
isub lsub fsub dsub  
imul lmul fmul dmul

Java

int long float double  
long float double  
float double

Narrowing Numeric Conversions

i2b i2c i2s l2i f2i f2l d2i d2l d2f

new

newarray anewarray multianewarray

getfield putfield getstatic putstatic

baload caload saload iaload laload  
faload daload aaload  
bastore castore sastore iastore  
fastore dastore aastore  
arraylength

instanceof checkcast

Java

pop pop2  
dup dup2  
dup\_x1 dup2\_x1 dup\_x2 dup2\_x2  
swap

Java

PC  
ifeq iflt ifle ifne ifgt ifge ifnull ifnonnull if\_icmpeq if\_icmpne  
if\_icmplt if\_icmpgt if\_icmple if\_icmpge if\_acmpeq if\_acmpne  
tableswitch lookupswitch  
goto goto\_w jsr jsr\_w ret

invokevirtual

Java

invokeinterface

invokespecial

invokestatic static

invokedynamic

4

Java

invokedynamic



```
1
2
3      java.lang.Class
```

4

" "

value	0	123
-------	---	-----

7-1

```
value      public static final int value=123
```

ConstantValue

clinit

```
static{
```

clinit

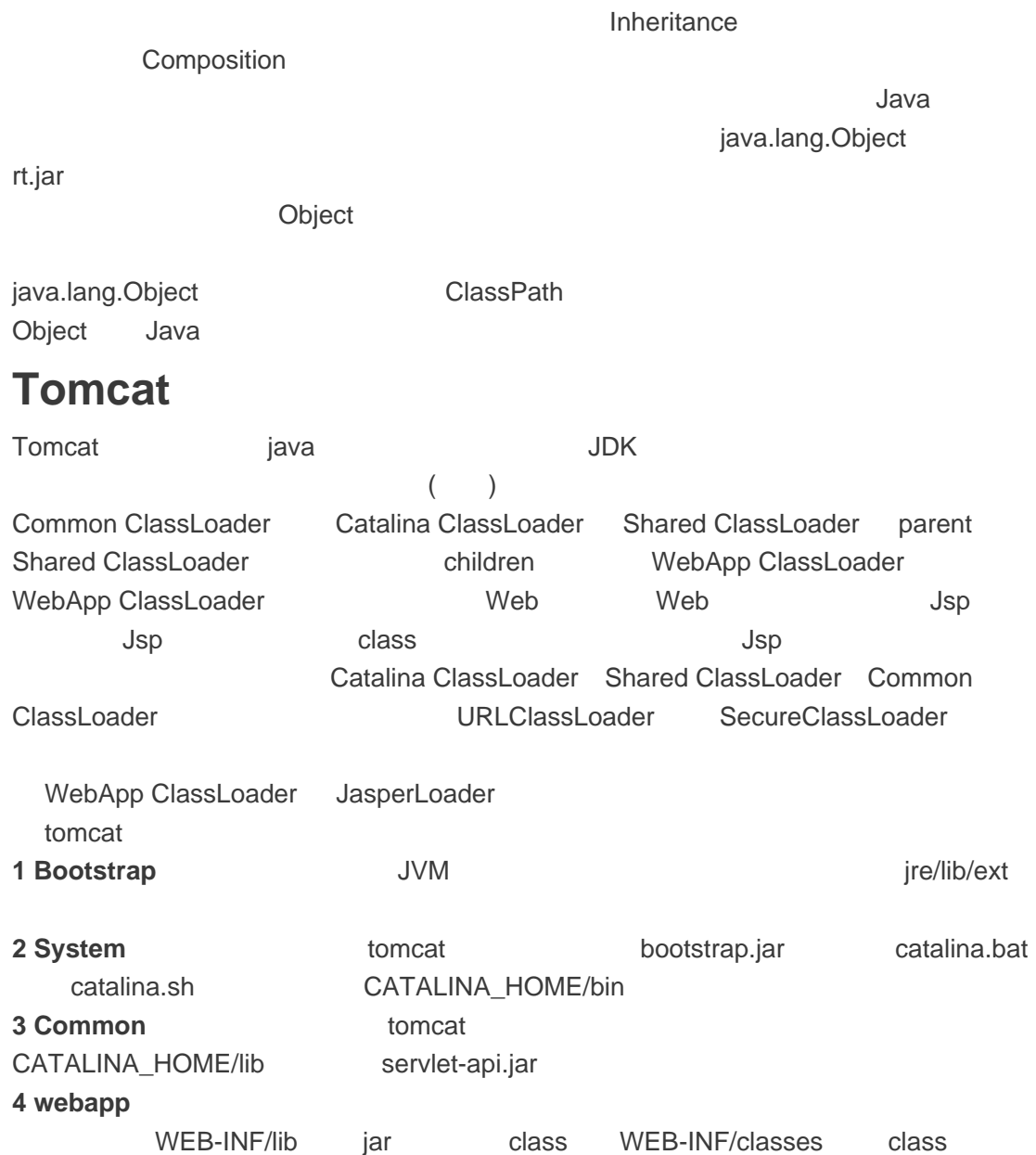
clinit

clinit

```

Java
" "
Class
" "
Class equals isAssignableFrom
isInstanceOf instanceof
ClassLoader
findClass
loadClass
findClass loadClass
loadClass
loadClass
loadClass
loadClass
Java
Bootstrap ClassLoader C++
Java
java.lang.ClassLoader
Bootstrap ClassLoader JAVA_HOME \lib
-Xbootclasspath
rt.jar lib
Java
null
Extension ClassLoader
sun.misc.Launcher$ExtClassLoader JAVA_HOME \lib\ext
java.ext.dirs
Application ClassLoader
$App-ClassLoader ClassLoader sun.misc.Launcher
getSystemClassLoader
ClassPath

```



PPT

PPT



Java                    "                    "

1/2 Human"                    Static Type                    Apparent  
Type                    " Man"                    Actual Type

Javac  
sayHello Human

Human                    man                    woman                    sayHello  
man

Father                    Son                    Father                    PPT                    Son

