



## DISSECTED FILE



```
~$ java simple
Hello World!
```

```
000: CA FE BA BE 00 03 00 2D .....-
008: 73 69 60 70 6C 65 07 00 04 01 00 10 0A 61 76 61 .....
2F 6C 61 6E 67 2F 4F 62 6A 65 63 74 01 00 04 6D .....
61 69 6E 01 00 04 43 6F 64 65 09 00 00 0A 07 .....
00 09 01 00 10 0A 61 76 61 2F 6C 61 6E 67 2F 53 .....
79 73 74 65 6D 0C 00 00 0C 01 00 03 6F 75 74 .....
01 00 15 4C 6A 61 76 61 2F 69 6F 2F 50 72 69 6E .....
74 53 74 72 65 61 6D 3B 00 00 0E 01 00 0C 48 65 .....
6C 6C 6F 20 57 6F 72 6C 64 21 0A 00 10 00 12 07 .....
00 11 01 00 13 6A 61 76 61 2F 69 6F 2F 50 72 69 .....
6E 74 53 74 72 65 61 6D 0C 00 13 00 14 01 00 07 .....
70 72 69 6E 74 6C 6E 01 00 15 28 4C 6A 61 76 61 .....
2F 6C 61 6E 67 2F 53 74 72 69 6E 67 3B 29 56 01 .....
00 16 28 5B 4C 6A 61 76 61 2F 6C 61 6E 67 2F 53 .....
74 72 69 6E 67 3B 29 56 .....
00 00 .....
0F2: 00 01 00 09 00 05 00 15 00 01 00 06 00 00 .....
00 15 00 02 00 01 00 00 .....
00 0F B1 00 00 00 00 .....
117: 00 00 .....
```

### SIMPLE.CLASS

## CONSTANT POOL

DATA USED BY THE CODE

```
000: CA FE BA BE 00 03 00 2D .....-
008: 73 69 60 70 6C 65 07 00 04 01 00 10 0A 61 76 61 .....
2F 6C 61 6E 67 2F 4F 62 6A 65 63 74 01 00 04 6D .....
61 69 6E 01 00 04 43 6F 64 65 09 00 00 0A 07 .....
00 09 01 00 10 0A 61 76 61 2F 6C 61 6E 67 2F 53 .....
79 73 74 65 6D 0C 00 00 0C 01 00 03 6F 75 74 .....
01 00 15 4C 6A 61 76 61 2F 69 6F 2F 50 72 69 6E .....
74 53 74 72 65 61 6D 3B 00 00 0E 01 00 0C 48 65 .....
6C 6C 6F 20 57 6F 72 6C 64 21 0A 00 10 00 12 07 .....
00 11 01 00 13 6A 61 76 61 2F 69 6F 2F 50 72 69 .....
6E 74 53 74 72 65 61 6D 0C 00 13 00 14 01 00 07 .....
70 72 69 6E 74 6C 6E 01 00 15 28 4C 6A 61 76 61 .....
2F 6C 61 6E 67 2F 53 74 72 69 6E 67 3B 29 56 01 .....
00 16 28 5B 4C 6A 61 76 61 2F 6C 61 6E 67 2F 53 .....
74 72 69 6E 67 3B 29 56 .....
00 00 .....
00 01 00 01 00 03 00 00 .....
00 01 00 09 00 05 .....
00 15 00 02 00 01 00 00 .....
00 0F B1 00 00 00 00 .....
00 00 .....
```

### METHODS

CONTAINS BYTECODE

HEXADECEMAL DUMP	ASCII DUMP	FIELDS	VALUES
CA FE BA BE 00 03 00 2D	.....-	magic	CAFEBABE
00 00	.....	minor_version	3
00 00	.....	major_version	45
00 00	.....	constant_pool_count	22
00 00	.....	00: <always empty>	
00 00	.....	01: class reference (name:#02)	reference to the "simple" class
00 00	.....	02: "simple" UTF-8 literal (length:6)	
00 00	.....	03: class reference (name:#04)	reference to the "java.lang.Object" class
00 00	.....	04: "java/lang/Object" UTF-8 literal (length:16)	
00 00	.....	05: "main" UTF-8 literal	a literal containing "main" (used as method name)
00 00	.....	06: "Code" UTF-8 literal	a literal containing "Code" (used as attribute name)
00 00	.....	07: field reference (class:#08 name+type:#10)	a reference to the "out" field of the "java.lang.System" class with the "java.io.PrintStream" type
00 00	.....	08: class reference (name:#09)	
00 00	.....	09: "java/lang/System" UTF-8 literal (length:16)	
00 00	.....	10: name+type (name:#11,type:#12)	
00 00	.....	11: "out" UTF-8 literal (length:3)	
00 00	.....	12: "Ljava/io/PrintStream;" UTF-8 literal (length:21)	
00 00	.....	13: string constant (content:#14)	a "Hello World!" string constant
00 00	.....	14: "Hello World!" UTF-8 literal (length:12)	
00 00	.....	15: method reference (class:#16 name+type:#18)	a reference to the "println" method of the "java.io.PrintStream" class which takes "java.lang.String" as argument and returns "void"
00 00	.....	16: class reference (name:#17)	
00 00	.....	17: "java/io/PrintStream" UTF-8 literal (length:19)	
00 00	.....	18: name+type (name:#19 type:#20)	
00 00	.....	19: "println" UTF-8 literal (length:7)	
00 00	.....	20: "(Ljava/lang/String;)V" UTF-8 literal (length:21)	
00 00	.....	21: "([Ljava/lang/String;)V" UTF-8 literal (length:22)	a literal which means, as a method type: takes an array of "java.lang.String" as argument returns "void"
00 00	.....	access_flags	ACC_PUBLIC 1
00 00	.....	this_class	#1 "simple"
00 00	.....	super_class	#3 "java.lang.Object"
00 00	.....	interfaces_count	0
00 00	.....	(no interfaces)	
00 00	.....	fields_count	0
00 00	.....	(no fields)	
00 00	.....	methods_count	1
00 00	.....	01:	
00 00	.....	access_flags	ACC_PUBLIC 1 ACC_STATIC 8
00 00	.....	name_index	#5 "main"
00 00	.....	descriptor_index	#21 Return type void Parameters (java.lang.String[])
00 00	.....	attributes_count	1
00 00	.....	01:	
00 00	.....	attribute_name_index	#6
00 00	.....	attribute_length	21
00 00	.....	info	
00 00	.....	max_stack	2
00 00	.....	max_locals	1
00 00	.....	code_length	9
00 00	.....	getstatic	PrintStream System.out
00 00	.....	ldc	String Constant "Hello World!"
00 00	.....	invokevirtual	void PrintStream.println(String)
00 00	.....	return	
00 00	.....	exception_table_length	0
00 00	.....	(no exception_table)	
00 00	.....	attributes_count	0
00 00	.....	(no attributes)	
00 00	.....	attributes_count	0
00 00	.....	(no attributes)	

SOURCE CODE

```
import java.io.PrintStream;

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

THIS IS THE WHOLE FILE. HOWEVER, MOST CLASS FILES CONTAIN MANY MORE ELEMENTS. EXPLANATIONS ARE SIMPLIFIED FOR CONCISENESS.

## TRIVIA

- JAVA WAS DEVELOPED BY JAMES GOSLING
- IT WAS ORIGINALLY CALLED OAK, IN 1991, THEN GREEN
- JAVA 1.0 WAS RELEASED IN 1995, AND IS OPEN SOURCE SINCE 2006

- JAR (JAVA ARCHIVE) ARE ZIP ARCHIVES CONTAINING CLASS FILES

```
~$ zip simple.jar simple.class
adding: simple.class (deflated 27%)
~$ java -cp simple.jar simple
Hello World!
```

- THE CAFEBABE MAGIC IS ALSO USED IN MACH-O FAT BINARIES
- JAVA 7 IS ACTUALLY 1.7, AND ENCODED INTERNALLY 51.0

