



**JCD**, Java Class Disassembler, is a Windows 95/NT program designed to disassemble Java 1.0.x and 1.1.x class files. A number of features have been included to enhance its usability.

- \* ability to save disassemblies
- \* ability to save/restore options (heading/instruction color & constant pool reference)
- \* color-coded headings and instructions
- \* drag and drop support
- \* integrated help system
- \* run multiple instances
- \* simplified/detailed disassemblies
- \* status bar

From the **File** menu, select **Open** and choose a class file to open. JCD disassembles this file and displays the disassembly as lines of text. Headings and instructions are color-coded. Select **Save As** to save the disassembly as a text file. Choose **Exit** to exit JCD.

From the **Options** menu, select **Heading/Instruction Color** followed by **Red**, **Green** or **Blue** to select the color used to highlight headings and instructions. Color selections take effect immediately. Also from **Options**, select **Constant Pool Reference** followed by **Show Index** or **Show Value** to show either constant pool index numbers or constant pool values when disassembling instructions (and other items). The **Show Index** or **Show Value** selection does not take effect until a subsequent class file is loaded and disassembled.

The **Help** menu provides help via **Help** and program copyright information via **About**. Right-click the mouse in the client area of JCD's main window to activate a popup help menu.

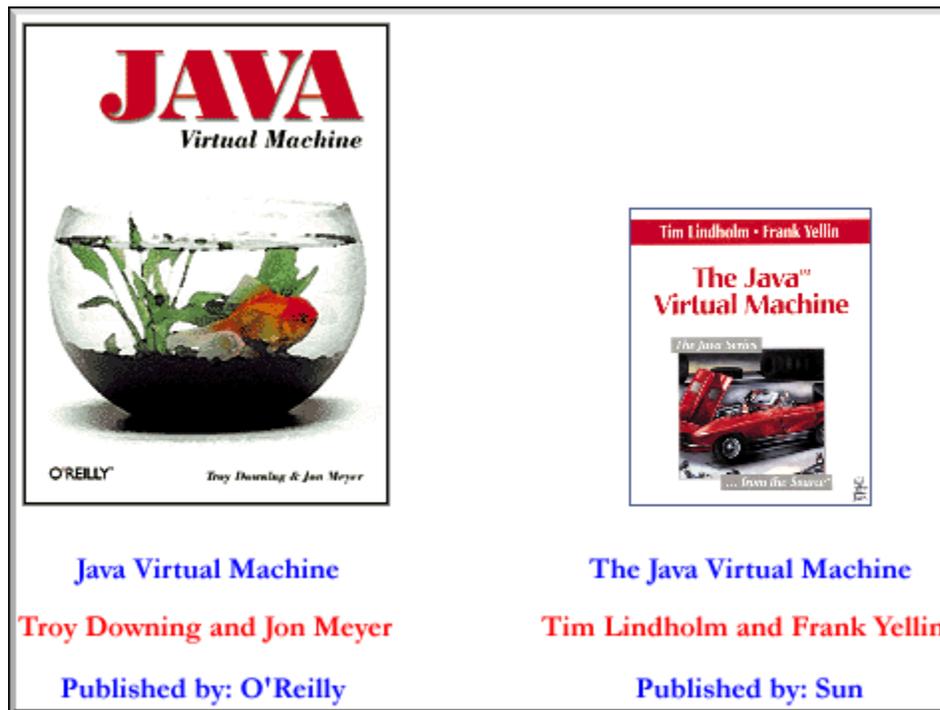
A disassembly begins with the path and name of the Java class file being disassembled. This is followed by three columns: **Offset**, **Field Name** and **Value**. A file-based offset (shown in hexadecimal notation and relative to 0) for each meaningful piece of information contained in the class file appears in the **Offset** column while the **Field Name** column identifies the kind of information and the **Value** column provides the information. The disassembly differs when displaying method code. The **Offset** column shows a program counter offset (shown in decimal notation and relative to 0) for each instruction while the **Field Name** column shows the actual instruction. Decimal notation is used exclusively in the **Field Name** and **Value** columns.

All Java class files contain a data structure known as the constant pool. The **constant pool** is a database consisting of multiple variable-length records (entries) of different types. Each entry is tagged to identify its type. A constant pool entry tagged **CONSTANT\_Utf8** holds a sequence of bytes encoded using a modified form of the **UTF-8** format that represents a Java **UNICODE** string. **ASCII** characters are represented as themselves with the most-

significant bit of the 8-bit byte set to 0. Non-ASCII characters are represented by two or three 8-bit bytes with the most-significant bit of each byte set to 1. JCD checks each byte to see if it represents an ASCII character or not. If the most significant bit is not set then the byte represents an ASCII character and JCD displays that character. If the most significant bit is set - not ASCII - then JCD displays a space character. Therefore, a sequence of three bytes with the most significant bit set in each byte (which represents a single UNICODE character) will result in JCD displaying three consecutive space characters. JCD will scan and display up to a maximum of 512 bytes from the Utf8 string.

JCD has been tested under Windows 95 and Windows NT. If you should run into any problems, I would appreciate being contacted. Please send me a copy of the offending class file. If you receive a message stating that the class file is corrupt, please indicate the number that appears in round brackets after the message.

Two books are available for those wanting more information about the makeup of the Java Virtual Machine (JVM).



Unfortunately, neither discusses enhancements to the JVM introduced to support inner classes.

Alot of effort has gone into writing JCD. If you like what you see (and want more) then please register your copy of this shareware program. The registration fee is only \$35. I'll email future updates to registered users only (please include your email address when registering). I'm currently adding printer support, search capabilities, and help reference material on the class file format and the virtual machine instruction set.

Please send check or money order to:

**Geoff Friesen**  
**508 - 200 Ronald Street**  
**Winnipeg, MB**  
**Canada**  
**R3J 3J3**

My email address is: [geoff@gatewest.net](mailto:geoff@gatewest.net)

My http address is: **<http://www.gatewest.net/~geoff>**  
Essentially, an inner class is a class within a class.

