

JAVA WORKSHOP

Johnny Carroll, Ph.D.
Dept. of Mathematical & Information
Sciences
Sam Houston State University
Huntsville, TX 77341
carroll@unx1.shsu.edu

Janice Carroll, M.S.
Dept. of Mathematical & Information
Sciences
Sam Houston State University
Huntsville, TX 77341
csc_jhc@unx1.shsu.edu

There are many in the Computer Science world that expect a "revolution" to occur soon in the program execution and development environment. Most of the others think that the revolution is already happening. Much of the excitement involves internet and web programming with the Java virtual machine environment and the Java language.

Java is a programming language that has been recently developed by employees of Sun Microsystems. Java, like C++, is an attempt to create an object-oriented C. The resulting language is very similar to C with notable additions, deletions and changes. Any Java program, whether a straight application or an applet that can be run inside a web browser, is a class. Java classes are constructed in a manner similar to C++ classes.

One of the things that makes Java special is its execution environment. A Java program, in general, is not compiled into any specific machine language. It is compiled into byte codes that are subsequently interpreted inside the Java virtual machine environment. This means that a Java program may be run on any computer where someone has created a Java interpreter. This is a very old concept, and on its own, it is not very noteworthy. However, the almost universal acceptance of Java with the various web browsers makes the possibilities endless. With the Java virtual machine environment built into the web browsers, a Java "applet" can be embedded in an HTML page and executed from within the browser. This ability will greatly increase the power and flexibility of new web applications.

The workshop will initially provide an overview of the Java language syntax by going over several short example programs and providing a contrast with C and C++. The features where Java differs from C and C++ will be emphasized during the initial overview. This phase can last as long as needed driven by the experience and needs of the attendees.

After the initial overview of the language, the workshop will contrast the construction of a Java application with the construction of a Java applet. A Java application is much like a C++ application complete with a main function and it executes in the Java virtual machine in a standalone fashion. Conversely, a Java applet is designed to be executed in the virtual machine embedded in a browser and which is called from within a web page. The Java virtual machine currently present in most browsers will only execute a subset of the Java language because of security concerns.

After this, some of the more exotic capabilities of Java and its virtual machine will be explored. Since it is designed to be executed from within a GUI environment, Java has windowing features and provides certain abilities to handle events such as mouse clicks. In addition to handling events, the virtual machine provides for multiple threads of execution within an application or applet. There are numerous other features that will be considered in this phase of the workshop including interprocess communication with processes on other computers via the socket interface and special features for image viewing.

The final phase of the workshop involves a discussion of the various development environments available for Java.