JAVA PROGRAMMING WORKSHOP

This course is for programmers who need a thorough grounding in the Java programming language and the Java 2 Application Programming Interface (API). The course covers writing stand-alone applications as well as writing applets that runs in a web page.

Audience

The course is intended for programmers experienced in other languages who need to be able to understand and write Java classes. The latest Java 2 versions are covered.

Prerequisites

Programmers should be experienced in using a procedural programming language such as Assembler, Cobol or PL/I, or experience of Visual Basic. For those programmers who have developed programs in 'C', C++ or C# there is some overlap with Java early on in the course. Knowledge of object-oriented programming or design is not necessary.

Duration

Five days. The course uses desk quizzes and hands-on practical exercises to enable the delegate to gain experience in developing Java applications and applets.

Course objectives

On completion of this course the delegate will be able to:

- create applications and applets
- use Object-Oriented Programming techniques
- program for the GUI environment
- write code to handle files
- have a realistic understanding of the terms Inheritance, Encapsulation and Polymorphism
- understand multi-tasking

Course contents

Introduction to Java Programming

What is Java?; Applications and applets; Development Environments; JDK; The Java Virtual Machine (JVM); Producing, compiling and executing; Just-In-Time compilation; CLASSPATH.

Introduction to Object-Oriented Programming

What is OOP?; Objects and Classes; using Objects; Object references; Constructors; Access modifiers; Packages; Inheritance; Polymorphism; Encapsulation; OOD; the Java API.

Data types and Operators

Coding a program; Reserved words; Data types, variables and operators; Statements and expressions; Strings; StringBuffer; arrays; arguments to main(); garbage collection.

Flow Control

Decision-making; program flow control; loops.

Classes and Methods

More on objects; passing arguments; Polymorphism and Abstract classes; constructors and initialization; accessors and mutators; the *this* keyword; interfaces; method signatures; casting and instanceof; static and final modifiers; overriding and overloading.

Collections

Sets; Lists; Vectors; Maps.

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Course contents continued

Exceptions

How exception handling works; class hierarchy; class wrappers; try...catch; try...finally; throw and throws; writing and using exception handlers; assertions.

Introducing the Graphical User Interface

The AWT; Swing; Frames; Layout Managers; using Components, Containers and Panels.

Events and Event Handling

Responding to an event; Listeners; GUI event; Interfaces; Adapters.

Menus, Text and Dialogs

Menus and dialogs; Using the mouse with Pop-up menus; text controls; menu options; labels; messages.

File Handling

The File class; Input and output streams; Readers and writers; Standard input and Standard output; File streams; BufferedReader class; Object Serialization; Exceptions.

Applets

Adding controls to applets; the Applet tag; parameters and properties; Graphics and paint; Testing the Applet; Browser Problems; security restrictions.

Threads

Call stacks; the Thread class and Runnable interface; Thread lifecycles; deadlock and synchronization.

Networking

Protocols; Client - Server; sockets and streams.