

Java Programming: A Comprehensive Hands-On Introduction - 4 Days

Course 471 Overview

You Will Learn How To

- Write, compile and execute Java programs
- Build robust applications using Java's object-oriented features
- Create robust applications using Java class libraries
- Develop platform-independent GUIs
- Read and write data using Java streams
- Retrieve data from a relational database with JDBC

Course Benefits

Java's unique architecture enables programmers to develop a single application that can run across multiple platforms seamlessly and reliably. In this hands-on course, you gain extensive experience with Java and its object-oriented features. You learn to create robust console and GUI applications and store and retrieve data from relational databases.

Who Should Attend

Anyone developing Java applications. Previous experience with a programming language such as C, JavaScript, PHP or COBOL is assumed. Familiarity with Web technologies and object concepts is helpful.

Hands-On Training

A series of hands-on exercises provides experience creating Java applications. Through an ongoing case study, you design and build an intricate desktop application modelled on a well-known Web site. Exercises include:

- Developing an object-oriented model with UML notation
- Creating Java objects and calling their methods
- Structuring data with the Java collections API
- Creating portable GUIs with Swing components
- Adding event handling to GUIs
- Retrieving data from a relational database with JDBC

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Course 471 Outline

Introduction to Java Programming

Advantages of Java

- Platform independence
- Stand-alone applications and servlets

Structure of a Java program

- Compiling source code into bytecode
- Overview of class libraries

Object-Oriented Programming with Java

The object paradigm

- Object-oriented (OO) programming
- Encapsulation, inheritance and polymorphism
- OO analysis and design: "Is a" and "Has a" relationships
- Designing an OO application step by step
- Diagramming object structure with Unified Modeling Language (UML)

Java's object-oriented features

- Instantiating objects from classes
- Aggregation and composition
- Extending existing classes
- Overloading and overriding methods

Structure of the Java Language

Language syntax

- Declaring and initialising variables
- Statements and expressions
- Declaring and using arrays
- Upcasting, downcasting and autoboxing

Flow control

- Invoking methods and passing parameters
- Conditionals and loops
- Handling exceptions with **try** and **catch**

Defining classes

- Fields (instance data)
- Methods (functions)
- Abstract classes and interfaces
- Organising classes with packages and visibility modifiers
- Composition vs. inheritance

Building the components of a Java program

- Working with exiting classes
- Leveraging generics with the collections API
- Extending base classes
- Developing new classes
- Compiling and debugging

Developing GUIs

Foundations of user interfaces

Java is a trademark of Sun Microsystems, Inc.

- Basic GUI widgets
- Event-driven programming
- Benefits of a portable windowing library

Java Foundation Classes (JFC)

- Advantages of lightweight Swing components
- Exploring the Swing component library
- Creating Swing components: buttons, text fields, drop-down lists
- Adding Swing components to containers
- Arranging Swing components using layout managers
- Dialogs and message boxes

Event handling

- Registering event handlers
- Inner classes and top-level classes

Storing and Retrieving Data with File I/O

Java streams

- Streams, Readers and Writers
- Accessing files
- Catching and throwing exceptions
- Formatting text output

Files and directories

- Reading and writing files
- Creating, deleting and renaming files
- Obtaining directory and file information

Working with Relational Databases

JDBC database access

- Leveraging the JDBC API
- Choosing database drivers
- Connecting to a database

Improving performance with prepared statements and stored procedures

- Submitting SQL statements
- Retrieving and processing results

Java Development Tools

- Java Development Kit (JDK)
- Compiler (javac)
- Javadoc utility
- Java Archive (JAR) utility
- Java Integrated Development Environments (IDEs)