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Java 7 Essentials for Object Oriented (OO) Developers

Course Summary

Description

Java 7 Essentials for OO Developers is a three-day, fast-paced, quick start to Java 7 training course geared for developers who have prior working knowledge of object-oriented programming languages such as C++. Throughout the course students learn the best practices for writing great object-oriented programs in Java 7 using sound development techniques, new improved features for better performance, and new capabilities for addressing rapid application development. In addition to the normal exercises that are liberally sprinkled throughout the course, there is a case study that covers the entire spectrum from use cases to object-oriented design to implemented classes.

Objectives

At the end of this course, students will be able to:

- Understand not only the fundamentals of the Java language, but also it's importance, uses, strengths and weaknesses
- Understand the basics of the Java language and how it relates to OO programming and the Object Model
- Work with the Java Virtual Machine and understand what functions it performs in running Java applications
- Learn to use Java multi-threading and exception handling features
- Understand and use classes, inheritance and polymorphism
- Work with various simple and complex data constructs as well as fields and methods
- Understand and use collections and generics
- Take advantage of the Java tooling that is available with the programming environment being used in the class

Topics

- Java: A First Look
- OO Concepts In Java
- Getting Started with Java™
- Essential Java™ Programming
- Advanced Java™ Programming
- Java™ Developer's Toolbox

Audience

This is an introductory- level Java course, designed for experienced developers who wish to get up and running with Java, or who need to reinforce sound Java coding practices, immediately. Attendees should have a working knowledge of developing OO software applications.

Prerequisites

Before taking this course, students should have practical skills equivalent to the skills in this course as a pre-requisite: *Object-Oriented Analysis & Design Using UML 2.x*

Duration

Three days

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Course Outline

I. Java: A First Look
- A. Using the JDK
  1. Setting Up Environment
  2. Locating Class Files
  3. Compiling Package Classes
  4. Source and Class Files
  5. Java Applications
- B. Writing a Simple Class
  1. Classes in Java™
  2. Class Modifiers and Types
  3. Class Instance Variables
  4. Primitives vs. Object References
  5. Creating Objects
- C. The Java™ Platform
  1. Java Platforms
  2. Lifecycle of a Java Program
  3. Responsibilities of JVM
  4. Documentation and Code Reuse

II. OO Concepts In Java
- A. Object-Oriented Programming
  1. Real-World Objects
  2. Classes and Objects
  3. Object Behavior
  4. Methods and Messages
- B. Inheritance, Abstraction, and Polymorphism
  1. Encapsulation
  2. Inheritance
  3. Method Overriding
  4. Polymorphism

III. Getting Started with Java™
- A. Adding Methods to the Class
  1. Passing Parameters Into Methods
  2. Returning a Value From a Method
  3. Overloaded Methods
  4. Constructors
  5. Optimizing Constructor Usage
- B. Language Statements
  1. Operators
  2. Comparison and Logical Operators
  3. Looping
  4. Continue and Break Statements
  5. The switch Statement
- C. Using Strings
  1. Strings
  2. String Methods
  3. String Equality
  4. StringBuffer
  5. StringBuilder
- D. Specializing in a Subclass
  1. Extending a Class
  2. Casting
  3. The Object Class
  4. Default Constructor
  5. Implicit Constructor Chaining

IV. Essential Java™ Programming
- A. Fields and Variables
  1. Instance vs. Local Variables: Usage Differences
  2. Data Types
  3. Default Values
  4. Block Scoping Rules
  5. Final and Static Fields
  6. Static Methods
- B. Using Arrays
  1. Arrays
  2. Accessing the Array
  3. Multidimensional Arrays
  4. Copying Arrays
- C. Java™ Packages and Visibility
  1. Class Location of Packages
  2. The Package Keyword
  3. Importing Classes
  4. Executing Programs
  5. Java Naming Conventions

V. Advanced Java™ Programming
- A. Inheritance and Polymorphism
  1. Polymorphism: The Subclasses
  2. Upcasting vs. Downcasting
  3. Calling Superclass Methods From Subclass
  4. The final Keyword
- B. Interfaces and Abstract Classes
  1. Separating Capability from Implementation
  2. Abstract Classes
  3. Implementing an Interface
  4. Abstract Classes vs. Interfaces
- C. Exceptions
  1. Exception Architecture
  2. Java 7 - Handling Multiple Exceptions
  3. Java 7 – Automatic Closure of Resources
  4. Creating Your Own Exceptions
  5. Throwing Exceptions
  6. Checked vs. Unchecked Exceptions

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Course Outline (cont'd)

VI. Java™ Developer's Toolbox

A. Utility Classes
   1. Wrapper Classes
   2. The Number Class
   3. Random Numbers
   4. The Date Class

B. Collections
   1. Characterizing Collections
   2. Collection Interface Hierarchy
   3. Generics and Collections
   4. Java 7 – The Diamond Operator
   5. Iterators
   6. The Set Interface
   7. The List Interface
   8. Queue Interface
   9. Deque Interface
   10. Map Interfaces
   11. Using the Right Collection
   12. Collections and Multithreading

C. Generics
   1. Generics and Subtyping
   2. Bounded Wildcards
   3. Generic Methods
   4. Legacy Calls To Generics
   5. When Generics Should Be Us