Java Fundamentals for Non-C Programmers

Course ID#:1260-475-ZZ-W

35 Hrs

Course Content

Course Description:

This course is paced to provide a solid foundation in Java™ for programmers without syntax experience in a C-based language. Intensive and hands-on, the course emphasizes becoming productive quickly as a Java programmer. Besides learning the basic structure and syntax of the language, students will also learn object-oriented principles and how they are applied in Java applications. The course then covers several of the provided API packages, such as I/O streams, collections, and accessing a database with JDBC. This course is current to Java 7 and uses the Eclipse IDE.

Prerequisites:

Professional programming experience in a high level language, such as COBOL and Visual Basic®.

Topics:

Getting Started with Java

- What is Java?
- How to Get Java
- A First Java Program
- Compiling and Interpreting Applications
- The JSDK Directory Structure

Eclipse

- Introduction to Eclipse
- Installing Eclipse
- Running Eclipse for the First Time
- Editors, Views, and Perspectives
- Setting up a Project
- Creating a New Java Application
- Running a Java Application
- Debugging a Java Application
- Importing Existing Java Code into Eclipse

Datatypes and Variables

- Primitive Datatypes
- Declarations
- Variable Names
- Numeric Literals
- Character Literals
- String
- String Literals
- Arrays; Non-Primitive Datatypes
- The Dot Operator

Operators and Expressions

- Expressions
- Assignment Operator
- Arithmetic Operators
- Relational Operators
- Logical Operators
- Increment and Decrement Operators
- Operate-Assign Operators (+=, etc.)
- The Conditional Operator
- Operator Precedence
- Implicit Type Conversions
- The Cast Operator

Control Flow

- Statements
- Conditional (if) Statements
- Adding an else if

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- Conditional (switch) Statements
- while and do-while Loops
- for Loops
- A for Loop Diagram
- Enhanced for Loop
- The continue Statement
- The break Statement

Methods

- Methods
- Calling Methods
- Defining Methods
- Method Parameters
- Scope
- So, Why All the static?

Object-Oriented Programming

- Introduction to Object-Oriented Programming
- Classes and Objects
- Fields and Methods
- Encapsulation
- Access Control
- Inheritance
- Polymorphism
- Best Practices

Objects and Classes

- Defining a Class
- Creating an Object
- Instance Data and Class Data
- Methods
- Constructors
- Access Modifiers
- Encapsulation

Using Java Objects

- Printing to the Console
- printf Format Strings
- StringBuilder and StringBuffer
- Methods and Messages
- toString
- Parameter Passing
- Comparing and Identifying Objects
- Parameter Passing
- Destroying Objects
- The Primitive-Type Wrapper Classes
- Enumerated Types

Inheritance in Java

- Inheritance
- Inheritance in Java Casting
- Method Overriding
- Polymorphism
- super
- The Object Class

Advanced Inheritance and Generics

- Abstract Classes
- Interfaces
- Using Interfaces
- Collections
- Generics
- Comparable

Packages

- Packages
- The import Statement
- Static Imports
- CLASSPATH and Import
- Defining Packages
- Package Scope

Exception Handling

- Exceptions Overview
- Catching Exceptions
- The finally Block
- Exception Methods
- Declaring Exceptions
- Defining and Throwing Exceptions
- Errors and RuntimeExceptions

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Input/Output Streams
- Overview of Streams
- Bytes vs. Characters
- Converting Byte Streams to Character Streams
- File Object
- Binary Input and Output
- PrintWriter Class
- Reading and Writing Objects
- Closing Streams

Core Collection Classes
- The Collections Framework
- The Set Interface
- Set Implementation Classes
- The List Interface
- List Implementation Classes
- The Queue Interface
- Queue Implementation Classes
- The Map Interface
- Map Implementation Classes

Collection Sorting and Tuning
- Sorting with Comparable
- Sorting with Comparator
- Sorting Lists and Arrays
- Collections Utility Methods
- Tuning ArrayList
- Tuning HashMap and HashSet

Introduction to JDBC
- The JDBC Connectivity Model
- Database Programming
- Connecting to the Database
- Creating a SQL Query
- Getting the Results
- Updating Database Data
- Finishing Up

JDBC SQL Programming
- Error Checking and the SQLException Class
- The SQLWarning Class
- JDBC Types
- Executing SQL Queries
- ResultSetMetaData
- Executing SQL Updates
- Using a PreparedStatement
- Parameterized Statements
- Stored Procedures
- Transaction Management

Appendix A – Advanced JDBC
- JDBC SQL Escape Syntax
- The execute() Method
- Batch Updates
- Updateable Result Sets
- Large Objects
- Working with Savepoints
- RowSets
- CachedRowSet
- DataSources

Appendix B – Eclipse Shortcuts
- Shortcut Key Sequences
- More Shortcut Key Sequences