Java SE, Part 1 of 4: Objects, Classes, and Constructors

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Meet the expert: Gene Van Sant has over two decades of experience as a software/systems implementer and solutions integration architect. He has experience as a contractor and maintains instructor certifications from IBM and others. Gene balances his career between implementing and automating full blown real world solutions and teaching classes/workshops on emerging technologies and products. This allows Gene to gain valuable extensive real world experience while also staying ahead of the wave with cutting-edge expertise.

Prerequisites: This course is intended for programmers who are interested in adding Java to their skills. The students should be familiar with object-oriented principals and the concept of object-oriented programming.

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Course description: Java was introduced many years ago not for the internet but has since expanded to be an industry standard for web pages. This course introduces the Java programming language and how to develop Java applications using Eclipse. You will learn the syntax of the Java programming language, object-oriented programming using Java, classes, constructors, class methods and control structures.

Course outline:

Overview of Java
- Introduction
- History of Java
- Benefits of Java
- What is Java
- What"s This "Virtual Machine"?
- Comparison to Other Languages
- Java Programs
- Basic Java Development Tools
- Demo: Basic Java Development Tools
- Java Editions
- Example - HelloWorld
- Java Classes
- Main Methods
- Statements
- Summary

Java Tools In Eclipse
- Introduction
- Eclipse Platform
- Eclipse Workspace
- Perspectives, Views & Editors
- Demo: Perspectives, Views & Editors
- Basic Operations with Eclipse
- The Java Perspective
- The Debug Perspective
- Navigator View
- Package Explorer
- Outline View
- Problems View
- Demo: Problems View
- Summary

Java Tools in Eclipse 2
- Introduction
- Eclipse Preferences
- Demo: Eclipse Preferences
- Build and Validation
- Code Completion, Templates and Snippets
- Searching
- Configure Compiler Class Path
- Demo: Configure Compiler Class Path
- JRE Switching
- Demo: JRE Switching
- Summary

Basic Object Concepts
- Introduction
- What Is An Object?
- State
- Behavior
- Encapsulation
- Encapsulation Examples
- Classes vs. Objects
- Inheritance
- Demo: Inheritance
- Polymorphism
- Demo: Polymorphism
- Interfaces
- Benefits Of Objects
- Demo: Benefits Of Objects
- Summary

Basic Java Syntax
- Introduction
- Declaring and Initializing Variables
- Keywords
- Coding Tips - Variables
- Primitive Data Types
- Logical - boolean
- Textual - char and String
- Integral - byte, short, int, long
- Floating Point - float and double
- Literal Values
- Strings
- Creating Strings
- White Space
- Comments
- Demo: Comments
- Coding Tips - Comments
- Java Statements
- Coding Tips - Statements
- Scope of a Variable
- System.out/System.in
- Scanner Class
- Demo: Scanner Class
- Summary

Decisions
- Introduction
- Operator Categories
- Special Situations
- Binary Operators
- Integer Division
- Numeric Promotion
- Type Conversion Of Primitive Types
- Demo: Type Conversion of Primitive Types
- Unary Operators
- Relational Operators
- Logical Operators
- Bitwise Operators
- Bitwise Examples
- Shift Operators
- Overflow And Underflow
- Demo: Overflow And Underflow
- Assignment Operators
- Ternary Operator
- Demo: Ternary Operator
- Calculation Errors
- Demo: Calculation Errors
- Operator Precedence
- Precedence Examples
- Demo: Precedence Examples
- Combining Strings
- Demo: Combining Strings
- Coding Tips - Operators
- Summary

Making Decisions
- Introduction

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Java SE, Part 1 of 4: Objects, Classes, and Constructors

- Control Flow Statements
- "if" Statement
- "if...else" Statement
- Nested Statements
- "Short Circuited" Operators
- Demo: "Short Circuited" Operat
- Coding Tips - if & if-else
- Demo: Coding Tips - if & if-else
- Summary

Using Classes and Objects
- Introduction
- Objects, Instances, And Classes
- What Are Classes?
- Working With Classes And Objects
- Instantiation
- Instance Methods
- Object References
- Demo: Object References
- String Operations
- The Math Class
- Demo: The Math Class
- Summary

Writing Classes
- Introduction
- Why Define Your Own Classes
- Encapsulation
- Elements Of A Class
- Defining Classes
- Coding Tips - Class Definitions
- Fields
- Defining Fields
- Coding Tips - Fields
- Methods
- Defining Methods
- Passing Parameters
- Demo: Passing Parameters
- Overloading Methods
- Demo: Overloading Methods
- Coding Tips - Methods
- Local Variable vs. Instance Variables
- Demo: Local Variable vs. Instance Variables
- Summary

Controlling Access
- Introduction
- Controlling Access
- Data Hiding
- Encapsulation
- JavaBeans
- Demo: JavaBeans
- Summary

Controlling Access 2
- Introduction
- Packages
- Problems Solved With Packages
- Naming Packages
- Declaring Packages In Classes
- Package Access
- Demo: Package Access
- Summary

Controlling Access 3
- Introduction
- Import Statement
- Demo: Import Statement
- Using Classes From Packages
- Coding Tips - Import Statements
- Correlation To File Structure
- Class Path
- Demo: Class Path
- Java Core Packages
- Demo: Java Core Packages
- Summary

Constructors and Class Members
- Introduction
- Demo: Constructors and Class Members
- Constructors
- Multiple Constructors
- Defining Constructors
- Default Constructor
- Zero Argument Constructor
- Example - Calling Constructors
- "this" Keyword
- Using "this" to Call a Constructor
- Demo: Using "this" to Call a Constructor
- Using "this" to Set a Field
- Summary

Constructors and ClassMembers2
- Introduction
- Demo: Constructors and ClassMembers2
- Class Members
- Examples Of Class Members
- Comparison: Instance Members
- Comparison: Class Members
- Use of Class Variables
- Demo: Use of Class Variables
- Static Class Methods
- Use of Class Methods
- Main Method And Command Line Arguments
- Demo: Main Method and Command Line Arguments
- Declaring and Using Constants
- Coding Tips - Class Members
- Useful Standard Class Members
- Demo: Useful Standard Class Members
- Static Initialization Blocks
- Demo: Static Initialization Blocks
- Summary

Control Structures
- "switch" Statement
- Example - switch
- Switch "Fall Through"
- "for" Loop
- Example - for
- Demo: Example - for
- "while" Loop
- Demo: "while" Loop
- "do...while" Loop
- Demo: "do...while" Loop
- Break Statement
- Example - break
- Labeled Statements
- Example - Labeled Break
- Continue Statement
- Example - Continue
- Example - Labeled Continue
- Coding Tips - Control Structures
- Demo: Control Structures
- Summary