

Java Programming Language, Java SE 6 (SL-275-SE6)

Duration: 5 Days

What you will learn

The Java Programming Language course provides students with a solid foundation for programming with Java, including: information about the syntax of the Java programming language; object-oriented programming with the Java programming language; creating graphical user interfaces (GUIs), exceptions, file input/output (I/O), and threads; and networking. Programmers familiar with object-oriented concepts can learn how to develop Java technology applications. The course features the Java Platform, Standard Edition 6 (Java SE 6) platform, and utilizes the Java SE Development Kit 6 (JDK 6) product. The students perform the course lab exercises using the NetBeans Integrated Development Environment (IDE).

Students who can benefit from this course:

Programmers who are interested in adding the Java programming language to their list of skills* Students who are preparing for the Oracle Certified Professional, Java SE 6 Programmer examination

Prerequisites

Required Prerequisites

Be competent in creating programs in any programming language or have completed the SL-110-SE6

Create and edit text files using a text editor

Fundamentals of the Java Programming Language course.

Understand object-oriented principles

Suggested Prerequisites

Fundamentals of the Java Programming Language, Java SE 6 (SL-110-SE6)

Course Objectives

Create Java technology applications that leverage the object-oriented features of the Java language, such as encapsulation

Execute a Java technology application from the command line

Use Java technology data types and expressions

Use Java technology flow control constructs

Use arrays and other data collections

Implement error-handling techniques using exception handling

Create an event-driven graphical user interface (GUI) using Swing components: panels, buttons, labels, text fields, and text areas

Implement input/output (I/O) functionality to read from and write to data and text files and understand advanced I/O streams

Create a simple Transmission Control Protocol/Internet Protocol (TCP/IP) networked client that communicates with a server

Create multithreaded programs

Course Topics

Getting Started

Examine Java technology

Analyze a simple Java technology application

Execute a Java technology application

Object-Oriented Programming

Define modeling concepts: abstraction, encapsulation, and packages

Discuss Java technology application code reuse

Define class, member, attribute, method, constructor, and package

Use the access modifiers private and public as appropriate for the guidelines of encapsulation

Invoke a method on a particular object

Use the Java technology API online documentation

Identifiers, Keywords, and Types

Use comments in a source program

Distinguish between valid and invalid identifiers

Use the eight primitive types

Define literal values for numeric and textual types

Define the terms primitive variable and reference variable

Declare variables of class type

Construct an object using new and describe default initialization

Describe the significance of a reference variable

Expressions and Flow Control

Distinguish between instance and local variables

Describe how to initialize instance variables

Recognize, describe, and use Java software operators

Distinguish between legal and illegal assignments of primitive types

Identify boolean expressions and their requirements in control constructs

Recognize assignment compatibility and required casts in fundamental types

Use if, switch, for, while, and do constructions and the labeled forms of break and continue as flow control structures in a

Arrays

Declare and create arrays of primitive, class, or array types

Explain why elements of an array are initialized

Explain how to initialize the elements of an array

Determine the number of elements in an array

Create a multidimensional array

Write code to copy array values from one array to another

Class Design

Define inheritance, polymorphism, overloading, overriding, and virtual method invocation

Use the access modifiers protected and the default (package-friendly)

Describe the concepts of constructor and method overloading

Describe the complete object construction and initialization operation

Advanced Class Features

Create static variables, methods, and initializers

Create final classes, methods, and variables

Create and use enumerated types

Use the static import statement

Create abstract classes and methods

Create and use an interface

Exceptions and Assertions

- Define exceptions
- Use try, catch, and finally statements
- Describe exception categories
- Identify common exceptions
- Develop programs to handle your own exceptions
- Use assertions
- Distinguish appropriate and inappropriate uses of assertions
- Enable assertions at runtime

Collections and Generics Framework

- Describe the general purpose implementations of the core interfaces in the Collections framework
- Examine the Map interface
- Examine the legacy collection classes
- Create natural and custom ordering by implementing the Comparable and Comparator interfaces
- Use generic collections and type parameters in generic classes
- Refactor existing non-generic code
- Write a program to iterate over a collection
- Examine the enhanced for loop

I/O Fundamentals

- Write a program that uses command-line arguments and system properties
- Examine the Properties class
- Construct node and processing streams, and use them appropriately
- Serialize and deserialize objects
- Distinguish readers and writers from streams, and select appropriately between them

Console I/O and File I/O

- Read data from the console
- Write data to the console
- Describe files and file I/O

Building Java GUIs Using the Swing API

- Describe the JFC Swing technology
- Identify the Swing packages
- Describe the GUI building blocks: containers, components, and layout managers
- Examine top-level, general-purpose, and special-purpose properties of container
- Examine components
- Examine layout managers
- Describe the Swing single-threaded model
- Build a GUI using Swing components

Handling GUI-Generated Events

- Define events and event handling
- Examine the Java SE event model
- Describe GUI behavior
- Determine the user action that originated an event
- Develop event listeners
- Describe concurrency in Swing-based GUIs and describe the features of the SwingWorker class

GUI-Based Applications

- Describe how to construct a menu bar, menu, and menu items in a Java GUI

Understand how to change the color and font of a component

Threads

Define a thread

Create separate threads in a Java technology program, controlling the code and data that are used by that thread

Control the execution of a thread and write platform-independent code with threads

Describe the difficulties that might arise when multiple threads share data

Use wait and notify to communicate between threads

Use synchronized to protect data from corruption

Networking

Develop code to set up the network connection

Understand TCP/IP

Use ServerSocket and Socket classes to implement TCP/IP clients and servers