

Java SE: Exploiting Modularity and Other New Features

Learn via: **Classroom/AFA**

Duration: **2 Day**

Overview

The Java SE: Exploiting Modularity and Other New Features course introduces the Java module system and other new features, including JShell, convenience methods, new techniques for working with streams, and managing deprecated APIs. Modularity was introduced in Java SE 9, so the approach to modular application development taught in this course will be applicable to developers moving to SE 9 or other imminent releases.

Learn To:

- Design applications to take advantage of the module system and its more reliable configuration, improved security and performance, and more easily scalable applications.
- Migrate existing applications to a modular applications in a step-by-step manner, choosing which parts of the application to migrate first.
- Deal with common problems encountered in migrating an application, including, cyclic dependencies and split packages.
- Use services to make modularized applications more robust and easily extensible.
- Create multi-release JAR files that can be run on different Java releases.
- Use convenience methods to reduce code that seems verbose, inefficient or boilerplate, and increase readability.
- Use JShell to quickly run small code experiments and test new APIs.

Benefits To You

By enrolling in this course, you'll learn how to use the module system to design applications with explicit dependencies and encapsulation at the JAR level, ensuring more reliable configuration, improved security and enhanced performance. You'll also get a chance to experiment with new features that ease development. These include convenience methods that make your code more readable and succinct, and JShell, an easy way to test code snippets and APIs.

Prerequisites

Required:

- Familiarity with NetBeans or similar IDE
- Familiarity with Object-oriented programming concepts
- Familiarity with Java Collections and Enumerators
- Familiarity with JDK 8 features

Suggested:

- Develop applications using the Java programming languages
- Ability to use object-oriented programming techniques
- Ability to use classes commonly found in Java programs
- Administer operating systems from the command line

Audience

- Project Manager
- Java Developers
- J2EE Developer
- Java EE Developers

What You Will Learn

- Identify deprecated APIs and possible alternatives
- Swap sub-optimal or tedious coding with convenience methods
- Create a modular Java application
- Identify and address common requirements in migrating older applications to modularity
- Run applications that combine modularized libraries and non-modularized libraries
- Create a custom runtime image
- Build Multi-release JAR files

- Design interfaces which implement methods
- Process stream data using new convenience methods
- Leverage JShell for fast code experiments
- Identify and apply new methods to more conveniently work with collections and arrays

Outline

Why Modules?

- Module System
- Levels of a Typical Application
- How Does Java SE 8 Address Maintainability and Reliability?
- Classes, Subclasses, Interfaces
- Class Level Unit of Reuse (Java SE 8)
- Packages
- JARs
- JAR Files and Distribution Issues

Working with the Module System

- Projects Before Modularization
- module-info.java: Introduction
- Creating a Truly Modular Project
- Compiling Modular JAR Files
- Accessibility Between Classes
- Readability Between Modules
- What Is Readable from the competition Module?
- The Effects of Exporting

Modular JDK

- Modular Development in JDK 9
- The JDK
- The Modular JDK
- Modules in JDK 9
- Java SE Modules
- The Module Graph of Java SE
- The Base Module
- Finding the Right Platform Module

Creating Custom Runtime Images

- What Is a Custom Runtime Image?
- Link Time
- Using jlink to Create a Custom Runtime Image
- Modules Resolved in a Custom Runtime Image
- Advantages of a Custom Runtime Image
- JIMAGE Format
- Footprint of a Custom Runtime Image
- jlink Resolves Transitive Dependencies

Migration

- Typical Application
- The League Application
- Run the Application
- The Unnamed Module
- Top-Down Migration
- Dependencies
- Check Dependencies
- Typical Application Modularized

Services

- Module Dependencies
- Service Relationships
- Expressing Service Relationships
- Using the Service Type in competition
- Choosing a Provider Class
- Module Dependencies and Services
- Designing a Service Type

- TeamGameManager Application with Additional Services

Multi-release JAR files

- Packaging an Application for Different JDKs
- Packaging an Application for Different JDK Versions
- The Solution: A Multi-Release JAR file
- What Is a Multi-Release JAR File?
- Structure of a JAR File
- Structure of a Multi-Release JAR File
- Search Process in an MRJAR
- Creating a Multi-Release JAR File

Private Interface Methods

- Private Methods in Interfaces
- Java SE 7 Interfaces
- Implementing Java SE 7 Interface Methods
- Implementing Methods in Interfaces
- What About the Problems of Multiple Inheritance?
- Inheritance Rules of default Methods
- Interfaces Don't Replace Abstract Classes

Enhancements to the Stream API

- One More Benefit of Default Methods
- Changing a Java Interface
- Why Enhance the Stream API?
- An Ordered List
- takeWhile Provides a Solution
- The Effects and Benefits of takeWhile
- An Unordered List
- filter vs takeWhile

JShell

- Has This Happened to You?
- A Million Test Classes and Main Methods
- JShell Provides a Solution
- Comparing Normal Execution with REPL
- Getting Started with JShell and REPL
- Scratch Variables
- Declaring Traditional Variables
- Code Snippets

Convenience Methods for Collections

- What Are Convenience Methods?
- Many Convenience Methods in Java SE 9
- Key Collections Interfaces
- Overloading the of Convenience Method
- Why Overload the of Method?
- Growing a Collection
- ofEntries Method for Maps
- Immutability

Convenience Methods for Arrays

- Arrays
- Modeling DNA Strands
- Working with DNA Strands
- Working with DNA Strands by Using a for Loop
- Convenience Methods in the Arrays Class
- Equating DNA Strands
- DNA Subsequences
- Equating Subsequences of DNA

Enhanced Deprecations for APIs

- What Is Deprecation?
- What Is Enhanced Deprecation?
- How Do You Deprecate an API?
- Using @deprecated
- Enhancements to the @Deprecated Annotation in JDK 9
- Using the @Deprecated Annotation

- Notifications and Warnings
- Compiler Deprecation Warnings