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J7J-xtrm

Java Design Patterns & Java Extreme

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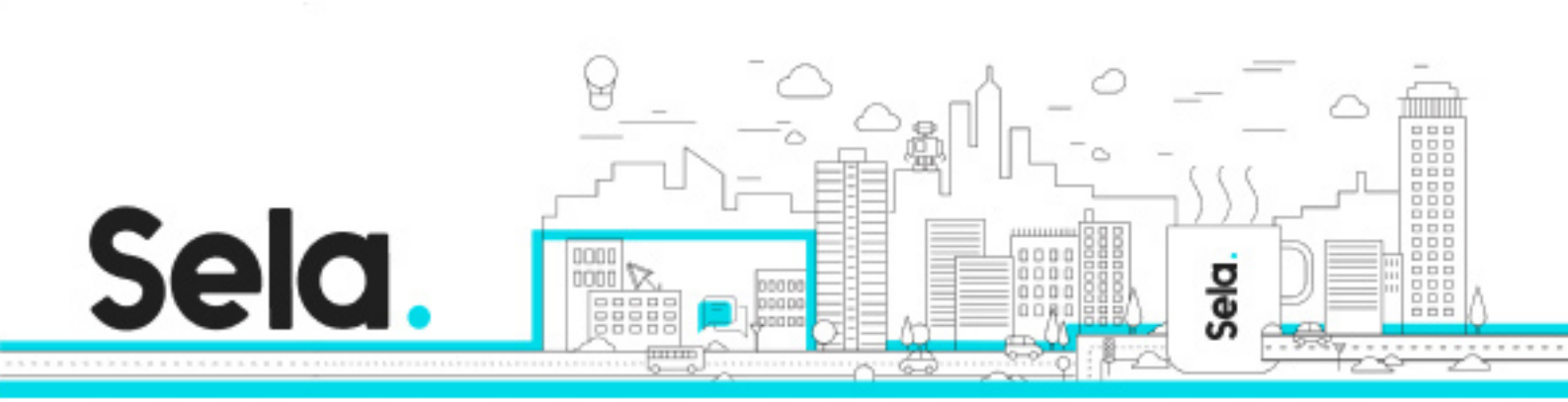

Java Design Patterns & Java Extreme

J7J-xtrm - Version: 1

8 days Course

Description:

Java Design Patterns segment:
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In this segment, programmers will be introduced to ideas and techniques commonly referred to as Java language patterns. Patterns are reusable solutions to recurring problems arising during software development. This course will introduce the programmer to common patterns and their implementation in the Java language. Patterns will be associated with their uses within the Java API, followed by design and implementation exercises to correlate several design patterns.
To make the best from the course, the first day will be devoted to some java language core issues such as reflection and memory management. The course starts with a “Pitfalls” section in which we will discuss some common misunderstandings in the Java language, clarify them and learn how to avoid them.
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Java Internals segment:
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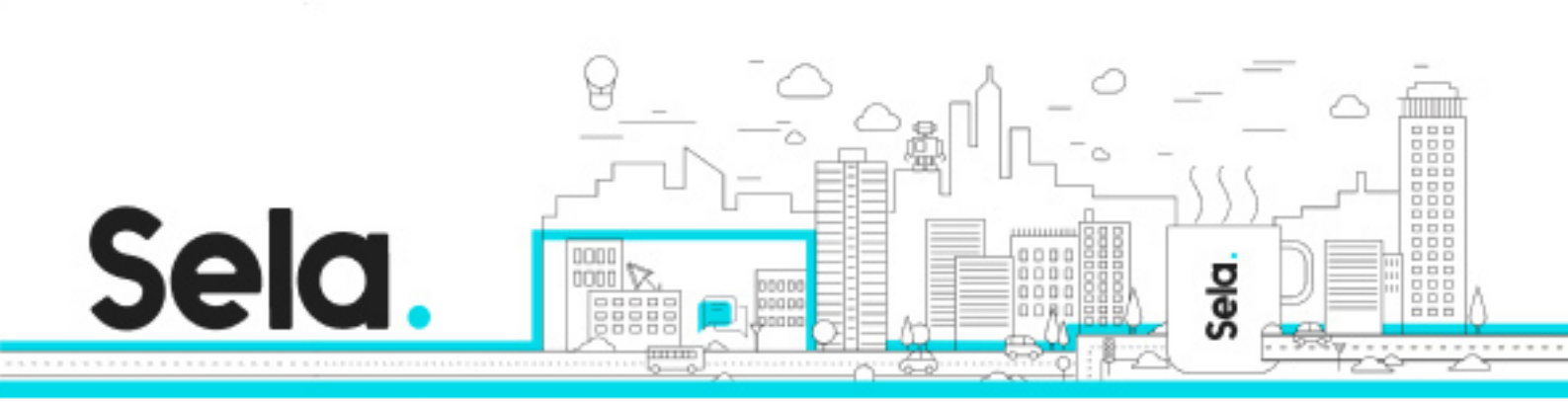
This segment will take you deep into the internal of java. The segment will take you inside the JVM and will deal with issues such as memory and thread management. The course will help you understand better the internal of your program and how to optimize it.

Intended audience:

This course is intended for Java programmers, team leaders, software project managers, Java designers and Object Oriented analysts that need to design system-level, software-level or module-level components to be implemented in the Java programming language.



Prerequisites:

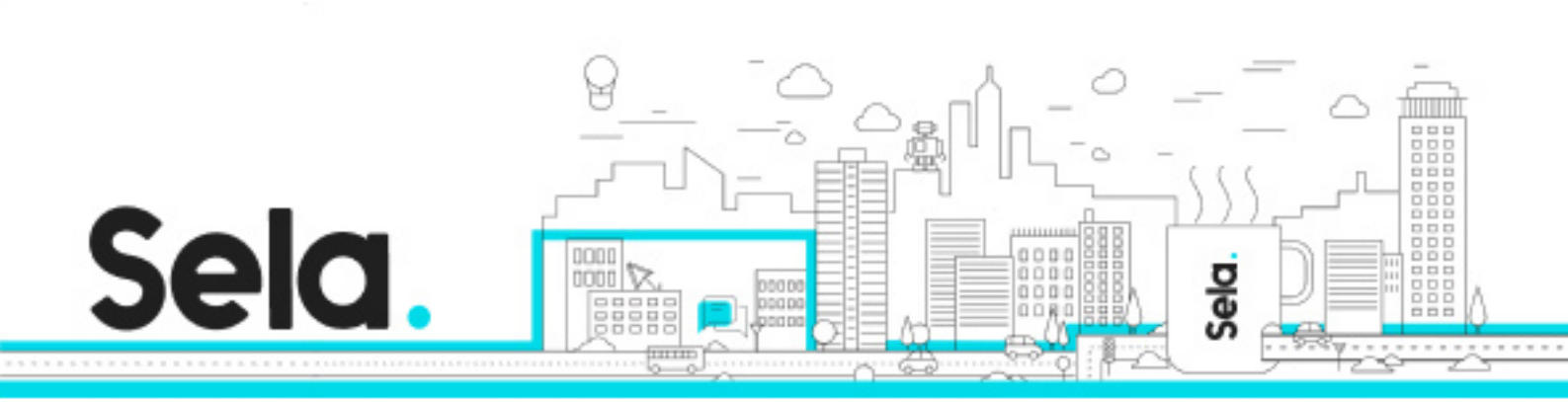
Objectives:

Learn what design patterns are useful for
Java programmers will associate the ideas with a real-life usage of patterns
Java programmers will be able to apply design patterns in their design work and implement them in the Java programming language
Get to know the advanced topics pertinent to Java programming
Learn to avoid common design and implementation mistakes and pitfalls
JVM internal mechanisms and optimization
efficient error management and data storage
Thread management

Topics:

Inside the java virtual machine

- Java introduction
- JVM overview
- Java flow
  - º Compiling Java
  - º Linking Java
  - º Running Java
- Class Loader
  - º Class Loader overview
  - º Implementing your class loader
  - º Class loader & namespace
  - º Class loader lab
- Understanding bytecode

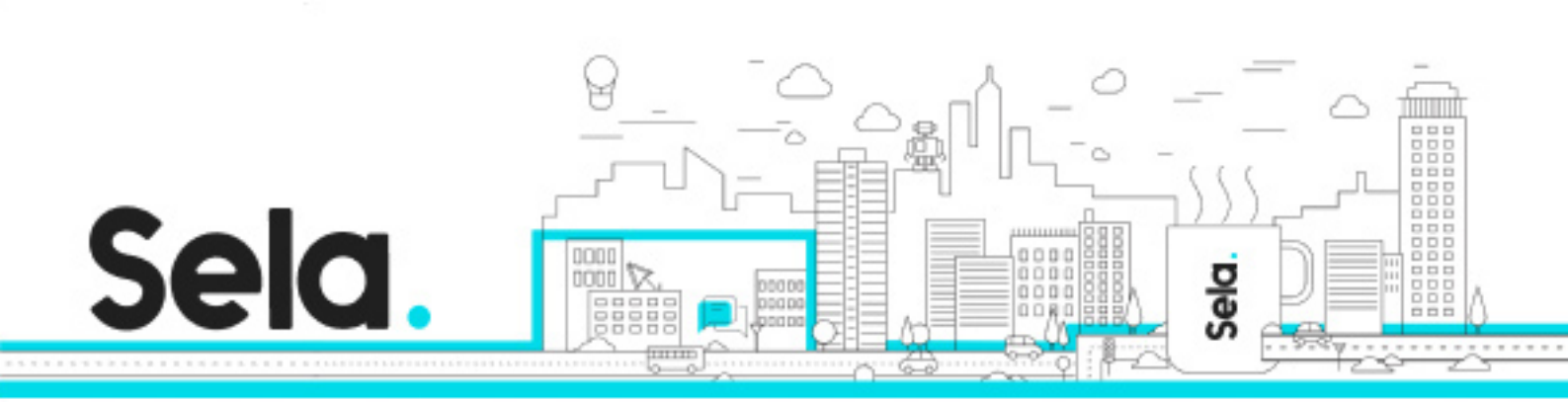


- Dependency Injection architecture
- Instrumentation
- Java Asist
- Instrumentation Lab

- Java profiling
- JNI – Java Native Interface
  - What is JNI?
  - The “native” Keyword.
  - The javah process.
  - Invoking native methods.
  - Passing arguments to native methods.
  - Objects, Arrays and Strings.
  - Local and Global references.
  - Callbacks methods’ id and fields’ id.
  - Handling Java errors (exception handling).
  - Threads.
  - Performance issues

Java concurrency in depth

- Threads & JVM
  - Inside java.lang.Thread
  - Green thread vs native threads
  - Thread priority
  - Appendix voltaile
- Thread scheduling
  - Scheduling in the JVM
  - Preformence meaning
- Threads operations
  - Stop / Suspend thread
  - isAlive & Active count



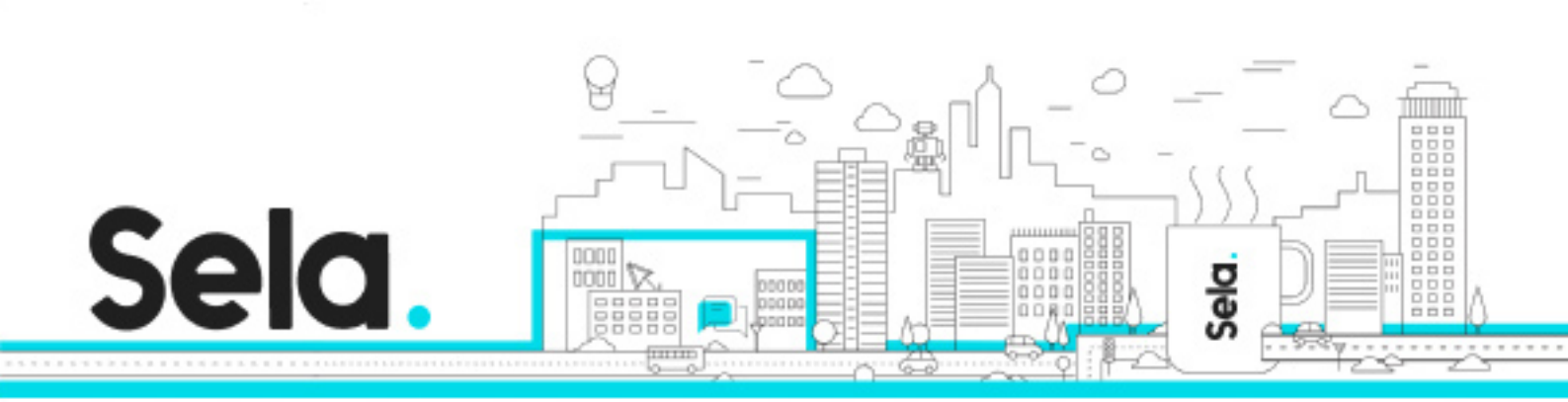
    - Join a thread
    - Recomended usage of yield & interupt
    - Deamon thread
- Thread lab
- Util concurrent package
    - Executores
    - Callback function
    - Future design pattern
    - Executores Service
    - ThreadPool
    - Thread pool lab
    - Barrier
    - Semaphore
    - Read & Write Lock
    - Util concurrent lab

JMX

- Overview of the JMX Technology
- Introducing MBeans
- MXBeans
- Notifications
- Remote Management

Optimization

- NIO
    - I/O overview
    - Buffers
    - Channels



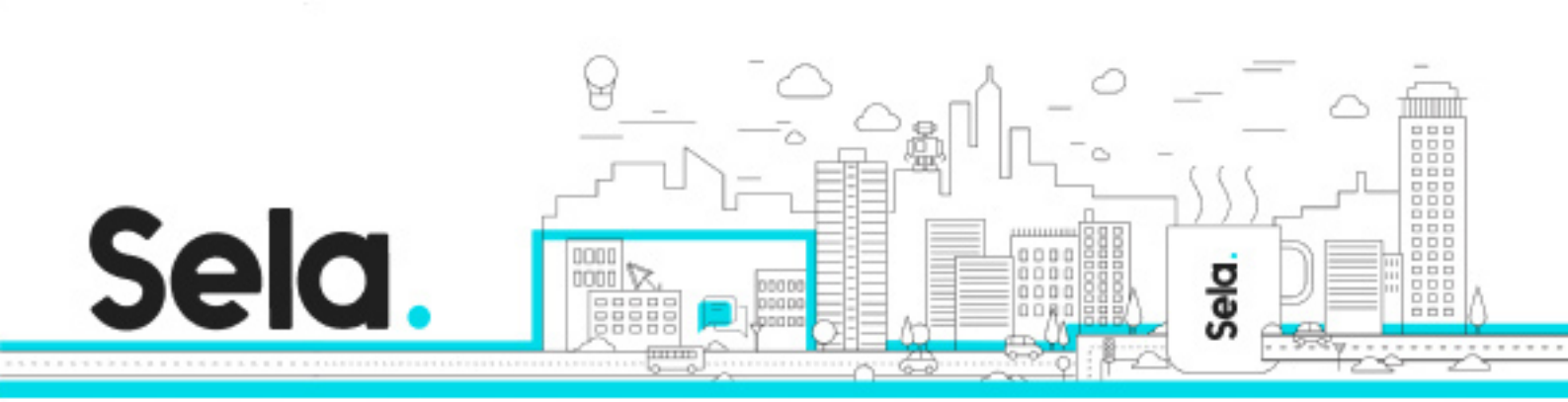
    - Selectors
    - Selection Keys
    - NIO lab
- Serialization
    - Serialization overview
    - The transient keywork
    - Customizing serialization
    - Serialization lab
- Optimization technique
    - Data structure optimization
    - Distributed optimization
    - Code optimization
- JVM tuning
    - Garbage collection tuning
    - Stack tuning
    - Memory tuning
    - Assertion
- Optimization lab

Java Pitfalls

- Common Java pitfalls and how to avoid them
- Equals(…) vs. = =
- Cloning objects

The reflection mechanism

- The java.lang.Class
- Dynamic instantiation
- Method invocation.



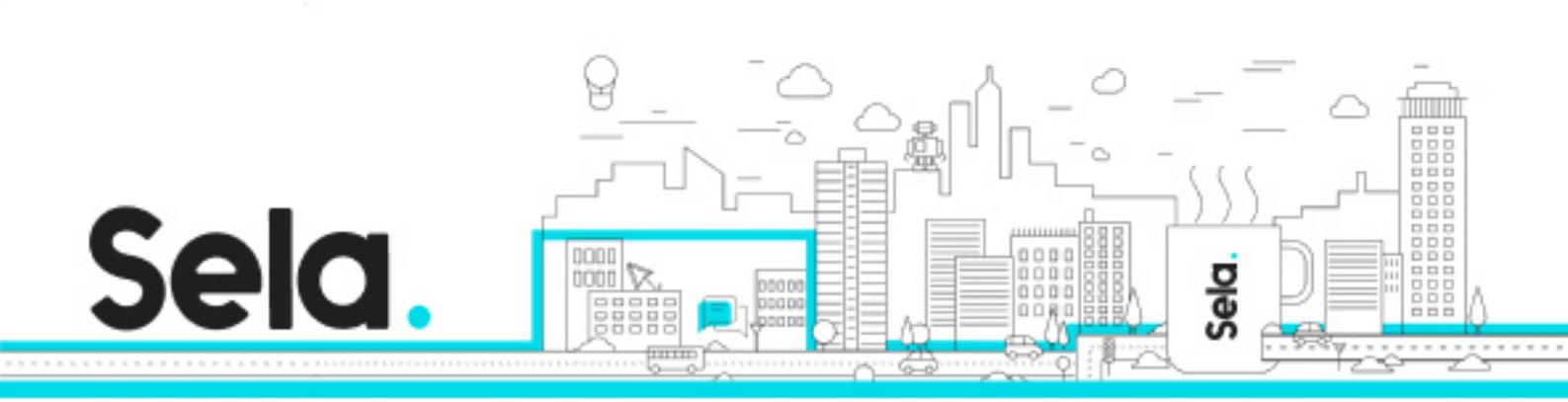
- Design Issues and limitations.
- annotation

Memory management

- Memory overview
- Memory profiling
- Object creation
- Reference management
    - Soft reference
    - Weak reference
    - Phantom reference
- Garbage collection
- Cache management
- Memory management lab

AOP appendix

- AOP oveview
- AspectJ
    - AspectJ overview
    - AJDT
- AspectJ language & API
    - Points
    - Advice
    - Aspects
    - API
- AspectJ lab
- Appendix 2. References.



º Introduction to Design Patterns

Design Principles

- The Open-Closed Principle
- Dependency Inversion Principle
- Interface Segregation Principle
- Single Responsibility Principle
- Liskov Substitution Principle & Design by Contract

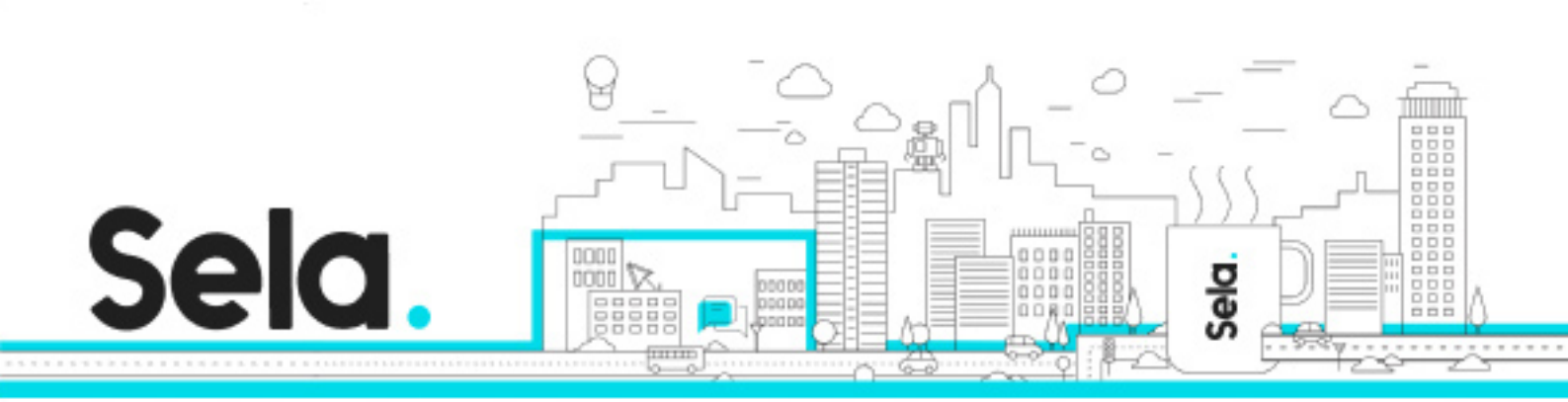
UML Overview

- Introduction to models
- Class diagrams
- Association
- Aggregation
- Generalization

Fundamental design patterns

- Delegation
- Strategy
- Interface
- Immutable
- Marker interface
- Proxy
- The Dynamic Proxy class

Creational patterns



- Singleton
- Factory method
- Abstract factory
- Object pool
- The Prototype Pattern

Structural Patterns

- Composite
- Adapter
- Iterator
- Fa?ade
- Decorator
- Bridge
- Double Dispatch idiom

Behavioral Patterns

- Command
- Template method
- State
- The Flyweight Pattern
- Observer
- Visitor