Course Outline

Scala – Advanced

Course Summary

Description

Scala may be the next wave in developer productivity. It is concise, object-oriented, functional, and offers support for concurrency, but is compatible with Java and is JVM – based. For this reason, Scala has been attracting the interest of many programming shops. However, these advantages are only possible through an effort of study. The Scala Programming course is designed to help this process through hands-on training.

This course is teaching Scala on the intermediate and advanced levels. It is targeted for developers who either have a basic knowledge of Scala or have a solid foundation of Java. This course teaches how to understand the essence of Scala and write functional programming software that is efficient and "scalaesque" enough.

Objectives

At the end of the course, students will be able to:

- Learn one of the hottest languages.
- Be a productive programmer with Scala.
- Learn the best software development practices with Scala.

Topics

- About Scala 3
- Understanding Types in Scala
- Functions and Collections
- Implicits and Type Classes
- Property-Based Testing in Scala
- Exploring Scala Effects
- Understanding Algebraic Structures
- Basic Monads
- Monad Transformers and Free Monad
- Introduction to the Ahha and Actor Models
- Building Reactive Applications with Akka Typed
- Basics of Akka Streams

Audience

The audience for this class includes Developers and Architects.

Prerequisites

Before attending this course, students should have basic knowledge of Scala (or the equivalent of an introductory course in Scala) or good knowledge of Java.

Duration

Three days

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I. About Scala 3
- A. An Introduction to Scala 3
- B. Scala vs. Java

II. Understanding Types in Scala
- A. Type declarations
- B. Type aliases
- C. Parameterized

III. Functions and Collections
- A. Ways to define a function
- B. Polymorphism
- C. Recursion
- D. Tail recursion
- E. Collections and higher order functions

IV. Implicits and Type Classes
- A. Getting to Know Implicits and Type Classes
- B. Types of implicits
- C. View and context bounds
- D. Type classes
- E. Implicit scope resolution

V. Property-Based Testing in Scala
- A. Introduction to property-based testing
- B. Properties and Generators
- C. Test-driven development

VI. Exploring Scala Effects
- A. Introduction to effects
- B. Option
- C. Either
- D. Try
- E. Future
- F. Cats library
- G. Cats effects

VII. Understanding Algebraic Structures
- A. Understanding Algebraic Structures
- B. Introduction to abstract algebraic structures
- C. Semigroup
- D. Monoid
- E. Foldable
- F. Group

VIII. Basic Monads
- A. Familiarizing Yourself with Basic Monads
- B. Introduction to monads
- C. Id Monad
- D. State monad
- E. Reader monad
- F. Writer monad

IX. Monad Transformers and Free Monad
- A. Look at Monad Transformers and Free Monad
- B. Combining monads
- C. Monad transformers
- D. Free monads

X. Introduction to the Akka and Actor Models
- A. An Introduction to the Akka and Actor Models
- B. Introduction to the actor model
- C. Akka basics
- D. Advanced topics
- E. Testing actors
- F. Running the application

XI. Building Reactive Applications with Akka Typed
- A. Introduction
- B. Akka Typed basics
- C. Akka Typed – beyond the basics
- D. Testing
- E. Running the application

XII. Basics of Akka Streams
- A. Introduction to Akka Streams
- B. Basics of Akka Streams
- C. Testing
- D. Running the application
- E. ZIO