DevelopIntelligence

Introduction to Kotlin

Course Overview:

The Introduction to Kotlin course will introduce students to the Kotlin programming language. Through a series of interactive lectures and labs, students will develop an awareness of the language and its interoperability with existing Java code and libraries. This begins by providing an overview of Kotlin and introduction to Intellij IDEA then moves into basic type systems. Students will also learn about control flow, operators and expressions and classes, and inheritance. On Day Two students will explore abstract, inner and anonymous classes as well as functions. This course is intended for those with little or no prior knowledge of Kotlin.

Course Duration: This course will be delivered in 2 days.

Prerequisites:

- Familiarity with Java 8 or a language with similar features.

Course Objectives:

After this course, you will be able to:

- Write simple programs using the Kotlin language
- Describe Java interoperability with existing code and libraries

This course does include:

- Basic Kotlin language features and syntax
- Object oriented programming in Kotlin
- Introduction to Functional programming in Kotlin
- Interoperability between Java and Kotlin

This course does NOT include:

- Basic OO concepts; Encapsulation, Inheritance, Generalization, Instance vs Static Features
- Java 8 features like Lambdas and Streams

Course Outline:

- What is Kotlin?
    - History of Kotlin
    - Introduction to Intellij IDEA
    - First Kotlin program (Hello World)
        - Comments
        - Function syntax
        - No semicolons
        - String interpolation
        - Print statements
        - Packages/import statements
- Basic type system
    - Val vs Var
    - lateinit
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- Primitive types
    - Int, Double, Long -> No implicit casting (For ex. addition)
    - list/array/set literals
- Nullability
    - ? vs !!
    - Elvis operator
    - let, apply, also, run, with
- Control Flow
    - Functions in Kotlin
    - Default Parameters
    - Single Line Expressions
    - If/Else
        - Smart Casting
        - Regular casting
    - Loops
        - For Loop
        - For each
        - Range
        - Map
        - Filter
    - When statement
- Operators and Expressions
    - Assignment Operator
    - Arithmetic Operator
    - Relational Operators
    - Logical Operators
    - Increment and Decrement Operators
    - Operate-Assign Operators (+=,etc.)
    - The Conditional Operator

        - Operator Precedence
        - Type Conversion in Kotlin
- Classes and Inheritance
    - Any
    - Primary/Secondary Constructors
    - Init block
    - this keyword
    - Creating instances of a class
    - Properties and Fields
    - Functions
        - Calling Functions
        - Defining Functions
        - Function Parameters
        - Variable argument parameters functions
        - Overriding functions
    - Visibility modifiers (private, public, protected, internal)
    - Companion Objects
    - Interfaces
    - Abstract classes
    - Inner classes
    - Anonymous classes
    - Data classes
    - Object as Singleton
- Java Interoperability
    - Kotlin from Java
    - Java from Kotlin