

## Advanced Java with Java 8

### Course Summary

#### Description

The Advanced Java with Java 8 Training Course provides you with advanced skills for programming in the Java language.

This course delves into functional programming, asynchronous programming, and other modern paradigms for getting the full power of the JVM and multiprocessor, multicore hardware. We will explore and explain the major new features of Java 8 and how they support high-performance servers and concurrent programming while avoiding some of the near-fatal problems of manual thread management and synchronization.

Although this course focuses on "pure" Java APIs via Java 8, the principles and patterns apply to many modern programming languages and libraries. In particular, while many large enterprises have yet to adopt Java 8, the same patterns and concepts can be implemented via Java 6+ compatible libraries like Google's Guava, which has wide enterprise acceptance.

You should take Advanced Java Training course if you are interested in learning more about the Java programming language in order to learn advanced programming techniques and concepts.

#### Objectives

By the end of this course, students will be able to:

- Select and use functions as units of application design in addition to classes/methods
- Choose appropriate data structures including Java 8 Stream-Lists and immutable collections
- Create highly concurrent code without creating threads and synchronizing state access
- Work with client and server sockets, and write your own basic HTTP servers and clients
- Identify and deploy proven patterns to solve complex Java problems

#### Topics

- Boundaries of the Java Class Paradigm
- Network I/O and Multicore Computing, and Concurrency
- Building Safe Parallel Programs Combining Classes and Functions

#### Audience

You should take Advanced Java Training course if you are interested in learning more about the Java programming language in order to learn advanced programming techniques and concepts. Be prepared to participate and ask questions in class, as well as dive in and complete a variety of small labs (which can be done collaboratively with other class members).

#### Prerequisites

To succeed fully in Advanced Java Training, you should be familiar and comfortable with basic Java programming concepts: Java syntax and object-oriented programming (OOP) in Java. Experience with the I/O package and threading basics is desirable.

#### Duration

Three days

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### Course Outline

- I. Boundaries of the Java Class Paradigm**
  - A. Interface statics and defaults
  - B. java.util.stream package
  - C. Functional interfaces and Lambdas
  - D. Algorithm design with Java 8 Streams
  
- II. Network I/O and Multicore Computing, and Concurrency**
  - A. Sockets
  - B. Threading and concurrency evolution
  - C. Multithreaded servers
  - D. Non-blocking servers
  
- III. Building Safe Parallel Programs Combining Classes and Functions**
  - A. Async programming
  - B. Promises and CompletableFuture