

C++ Multi-Threading and Concurrency



Overview

This course provides a detailed exploration of multi-threading constructs in the C++ language led by industry experts. You'll familiarize yourself with threads through hands-on exercises, gaining insights into what distinguishes an expert C++ programmer. Learn from their experiences to avoid common pitfalls.

Length: 1 Day

Software: Visual Studio
Community 2022

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Course Objectives

After completing this course, you will:

- Have a solid understanding of Concurrency.
- Be able to optimize algorithms.
- Be able to debug, analyze, test, and benchmark your concurrent code.

Target Audience

This course is tailored for C++ programmers and individuals eager to delve into advanced topics in C++ and programming. Beginning with core concepts, it progressively introduces more advanced ones. Hands-on practice reinforces newly acquired techniques throughout the course.

Prerequisites

Understanding of C++ language is essential for this course.

Teaching Methodology

- Instructional strategies include lectures, discussions, demonstrations, and workshop-based learning which are used to convey information, facilitate learning, and promote understanding.
- Learning activities include exercises and projects designed to engage students in the learning process actively.

Course Outlines

DAY 1

Multi-threading

- ◊ Threads, Cache Line, Race Conditions and False Sharing
- ◊ Atomics
- ◊ Mutexes, Locks and Guards
 - Introduction to RAII
- ◊ Async and Future Promises
- ◊ Coroutines
- ◊ Memory Orders
- ◊ Designing a Concurrent Queue

Benchmarking

- ◊ Google Benchmarking Library

Debugging Techniques

- ◊ Debugging Concurrent Code
- ◊ Profiling