

En-lighten Technology Ltd

Programming with Go: Hands-On

Overview

The Go language handles the demands of scalable, high-performance web applications and services by providing clean and fast compiled code, garbage collection, a simple concurrency model, and a rich standard library.

This course provides a comprehensive introduction to the Go programming language and shows how it can be used to develop REST microservices.

Attendees will learn how to

- Write powerful applications and Web services using Go
- Use core features such as functions, structs and methods
- Make use of Go's collections including arrays, slices and maps
- Write concurrent code using Goroutines and channels
- Handle application errors
- Write REST web services
- Test and benchmark code

Audience and Recommended Background

The course is a hands-on course with practical exercises. No prior knowledge of Go is required but experience in a high level language such as Java or Python or similar is expected.

Course Approach

Taught material will be delivered in short sessions and will be followed by the opportunity to practice what has been taught and reflect on how to put it into practice.

Course Duration: 3 days

Course Content

Introduction to Go

- Introducing Go
- Hello World in Go
- Adding initialization behaviour
- Accessing command line arguments

Program Structure

- Names, declarations and variables
- Assignments
- Type declarations
- Packages and files
- Scope
- Data types
 - Basic data types

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- Composite types
 - Arrays, Slices, Ranges, Maps, JSON, Text and HTML types
- Flow control

Functions

- Defining Functions
- Zero, single and multiple parameter functions
- Returning values
- Variadic parameter lists
- Call by Reference
- Anonymous Functions
- Deferring a Function call
- Panic and Recover

Structs and Pointers

- Defining as struct
- Initialising structs
- Nesting structs
- Default values
- Public and private valuea
- Pointers and references

Methods and Interfaces

- Using methods
- Creating method sets
- Working with methods and pointers
- Using interfaces

Handling Errors

- Handling errors in Go
- Basics of Error Handling
- Returning an Error
- Custom Error Types

Packages

- Packages and Modules
- Packages
- Go Packages
- Installing Packages
- Importing a Package
- Defining Packages
- Package Initialization
- Modules

Concurrency and Goroutines

- Goroutine Introduction
- Executing Goroutines
- Simple Goroutine Example

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- Wait for Goroutine to finish
- WaitGroup
- Channels
- Communicating via Channels
- Sending Complex messages
- Channel Buffering
- Channel Directions
- Closing Channels
- Channel Select
- Range Over Channels

Testing

- Introduction to Go Testing
- The go_test tool
- Test functions
- Coverage
- Benchmarking

GO Rest Services

- RESTful services with Go
- Basic net/http package
- REST based Web services
- Handling requests
- Processing requests
- Creating and parsing JSON