

Go Programming

Duration: 3 Days

Prerequisites:

- Basic understanding of programming concepts such as variables, loops, functions, and conditionals.
- Familiarity with at least one programming language (e.g., C, C++, Java, Python, etc.), which will help in grasping Go's syntax and structure more quickly.
- Knowledge of fundamental data structures like arrays, strings, and maps is beneficial.
- Basic command-line skills, especially for setting up the environment and executing programs.
- Willingness to learn and experiment with new programming paradigms, as Go may introduce concepts not found in other languages the student has experienced.
- Access to a computer with internet connectivity to install the necessary software and tools for Go development.

Course Description:

The Go Programming (Go Lang) course is designed to provide a comprehensive introduction to Go, an open-source programming language created by Google. This course covers everything from the basic structure and syntax of the language to its advanced features, such as concurrency with goroutines and channels. With a focus on practical application, the course is structured into modules that guide learners through the Go environment setup, basic syntax, data types, variables, constants, operators, decision making, loops, functions, scope rules, strings, arrays, pointers, structures, slices, maps, recursion, type casting, interfaces, error handling, and packages. By enrolling in the Golang Training, students will gain a solid foundation in Go Language Course principles and be able to build efficient and reliable software. The course is designed for both beginners and experienced programmers, offering a step-by-step approach to mastering Go. The hands-on lessons and examples will help learners to become proficient Go developers, ready to tackle real-world programming challenges.

Target Audience:

- Software Developers interested in backend systems
- Programmers looking to learn a modern, efficient language
- DevOps Engineers aiming to write scripts or automation tools in Go
- Computer Science students specializing in systems programming
- IT Professionals wanting to develop network servers or distributed systems
- Technical Leads managing teams that will use Go
- Full Stack Developers expanding their backend skills
- System Architects designing scalable, high-performance applications
- Cloud Computing Experts working on infrastructure that supports Go
- Open-Source Contributors who contribute to projects written in Go
- Mobile App Developers looking to understand Go for server-side systems
- Data Scientists requiring performance-oriented code for data processing

Course Outlines:

1. OVERVIEW

- Features of Go Programming
- Features Excluded Intentionally
- Go Programs.
- Compiling and Executing Go Programs

2. ENVIRONMENT SETUP

- Local Environment Setup
- Text Editor
- The Go Compiler
- Download Go Archive
- Installation on UNIX/Linux/Mac OS X, and FreeBSD
- Installation on Windows
- Verifying the Installation

3. PROGRAM STRUCTURE

- Hello World Example
- Executing a Go Program

4. BASIC SYNTAX

- Tokens in Go
- Line Separator
- Comments
- Identifiers
- Keywords
- Whitespace in Go

5. DATA TYPES

- Integer Types
- Floating Types
- Other Numeric Types

6. VARIABLES

- Variable Definition in Go
- Static Type Declaration in Go
- Dynamic Type Declaration / Type Inference in Go
- Mixed Variable Declaration in Go
- The lvalues and the rvalues in Go

7. CONSTANTS

- Integer Literals
- Floating-point Literals
- Escape Sequence
- String Literals in Go
- The const Keyword

8. OPERATORS

- Arithmetic Operators
- Relational Operators
- Logical Operators
- Bitwise Operators
- Assignment Operators
- Miscellaneous Operators
- Operators Precedence in Go

9. DECISION MAKING

- The if Statement
- The if...else Statement
- Nested if Statement
- The Switch Statement
- The Select Statement
- The if...else if...else Statement

10. LOOPS

- for Loop
- Nested for Loops
- Loop Control Statements
- The continue Statement
- The goto Statement.
- The Infinite Loop

11. FUNCTIONS

12. SCOPE RULES

- Local Variables
- Global Variables
- Formal Parameters
- Initializing Local and Global Variables

13. STRINGS

- Creating Strings
- String Length
- Concatenating Strings

14. ARRAYS

- Declaring Arrays
- Initializing Arrays
- Accessing Array Elements
- Go Arrays in Detail
- Multidimensional Arrays in Go
- Two-Dimensional Arrays
- Initializing Two-Dimensional Arrays
- Accessing Two-Dimensional Array Elements
- Passing Arrays to Functions

15. POINTERS

- What Are Pointers?
- How to Use Pointers?
- Nil Pointers in Go
- Go Pointers in Detail
- Go – Array of Pointers
- Go – Pointer to Pointer
- Go – Passing Pointers to Functions

16. STRUCTURES

- Defining a Structure
- Accessing Structure Members
- Structures as Function Arguments
- Pointers to Structures

17. SLICES

- Defining a slice
- len() and cap() functions
- Nil slice
- Subslicing
- append() and copy() Functions

18. RANGE

19. MAPS

20. RECURSION

21. TYPE CASTING

22. INTERFACES

23. ERROR HANDLING

24. Packages

25. Concurrency – Goroutines & Channels

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