

# Mastering Go

A deep-dive to master the Go programming language

*Pipal Academy*

# Overview

***A language that doesn't affect the way you think about programming, is not worth knowing.***

— Alan J. Perlis

Go is an open source programming language that makes it easy to build simple, reliable, and efficient software. Its concurrency mechanisms makes it easy to write reliable network programs effortlessly. No wonder, it is becoming the goto language for building distributed systems.

This hands-on workshop is a deep-dive to master the Go programming language.

## Approach

This is a hands-on workshop and the participants will learn by doing. There will be a lot of examples and practice problems to understand the concepts in depth, idioms of the language and best practices.

This is an advanced programming workshop and pre-workshop reading material and practice problems will be provided to speed up the pace of the workshop.

Each day will have four sessions.

## Pre-requisites

- Participants should have very good software development experience.
- Participants should have understanding of basic concepts of the Go programming language. Pre-workshop reading material and practice problems will be provided a week before the workshop to achieve that. This helps to keep the focus of the workshop on advanced topics.

# Software & Hardware Requirements

- All the participants are required to have Go 1.11+ preinstalled on their computers.
- It is recommended to use a Unix computer (GNU/Linux or Mac OS X).

# Target Audience

## **A Software Developer**

A software developer with interest in building server-side applications in Go, looking for deeper understanding of concurrency patterns and best practices of building scalable applications.

## **A Software Architect**

A Software Architect with interest in building distributed systems and microservices using Go.

# Outline - Day 1

## *Session 1: **Getting Started***

- Quick introduction to the Go programming language
- Naming conventions
- Variables, assignments and type declarations
- Functions and methods
- Conditionals and loops

## *Session 2: **Basic & Composite Types***

- Integers, floating-point numbers & booleans
- Strings and bytes
- Arrays and slices
- Maps and struct
- JSON and templates

# Outline - Day 1 (Contd.)

## *Session 3: Functions*

- Function declarations
- Multiple return values
- Handling errors
- Deferred function calls
- Varadic functions
- Panic and recover

## *Session 4: Packages*

- The package declaration
- Imports
- The import path
- Documenting packages



# Outline - Day 2

## *Session 5: Methods*

- Method declarations
- Struct embedding
- Encapsulation

## *Session 6: Interfaces*

- Introduction to interfaces
- Comparision with classes
- Example: parsing command-line flags
- Example: sorting with `sort.Interface`

# Outline - Day 2 (Contd.)

## *Session 7: Working with Files*

- Reading and writing files
- Working with buffers
- Handling errors

## *Session 8: Go Developer Tools*

- The go test tool
- Writing effective tests
- Coverage
- Benchmarking
- Profiling

# Outline - Day 3

## *Session 9: **Concurrency: Goroutines and Channels***

- Introduction to Goroutines and Channels
- Building concurrent applications using Goroutines

## *Session 10: **Concurrency with Shared Variables***

- Concurrency with shared state
- Race conditions
- Synchronizatin using Mutex locks

## Outline - Day 3 (Contd.)

### *Session 11: Advanced Concurrency Patterns*

- Building data streams
- Working with multiple channels using select
- Channels are first-class objects

### *Session 12: Practice Session & Wrap-up*

- Best Practices
- Go in Production
- Where to go from here

# Trainers

## Anand Chitipothu

Anand has been crafting beautiful software since a decade and half. He's now building a data science platform, rorodata, which he recently co-founded. He regularly conducts advanced programming courses through Pipal Academy.

He is co-author of web.py, a micro web framework in Python. He has worked at Strand Life Sciences and Internet Archive.

## A S L Devi

Devi has been developing software for the last 14 years. She has conducted trainings and given talks at various conferences like PyCon India, RootConf.

She has worked with PowerToFly, Avaaz foundation in the past. She has done M.Tech. in Computational Science from Indian Institute of Science, Bangalore.