Advanced Go Workshops Syllabus - Paragon

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This is a syllabus for "hands on" Advanced Go workshops. Each workshop is a full day (9:30 - 17:30) at the customer office.

Prerequisites

We'll use the Go SDK from https://golang.org/dl/. Students are free to choose their IDE. Some recommended ones are VSCode with Go extension or GoLand. Students also need to have Git & Docker on their machine.
Students are required to have some experience with Go and know how to use the command line. We'll solve many exercises during the workshop.

Syllabus

Session 1 - RPC
- Advanced JSON
  - Custom serialization
  - Missing vs empty values
  - Streaming JSON
- HTTP clients
  - Request body
  - Streaming
  - Authentication
- HTTP servers
  - Dependency injection
  - Writing middleware
  - Streaming responses
  - Routing

Session 2 - Going Faster
- Benchmarking & profiling
- Performance tips & tricks
- Optimizing memory

Session 3 - Advanced Concurrency
- Channel semantics
- Goroutine pools
- The "sync" & "sync/atomic" packages
- Handling panics in goroutines

Session 4 - OO Patterns
- Pointer vs value semantics
- Embedding structs
- Interfaces in depth
- The empty interface and type assertions
- Iterators

Session 5 - Project Engineers
- Creating go executables
  - Injecting version
  - Embedding assets
- Configuration & command line parsing
- Logging & metrics
- Writing secure Go code

Session 6 - Testing
- Running services
- Mocking and when to avoid them
- Reading test data from files
- Fuzzing

Possible Other Subjects
This is a list of possible subject, let's discuss what should go into the syllabus
- Effective Unicode
- Calling C from Go
- Working with Redis
- Working with SQL database
  - database/sql
  - sqlx
- Building docker images
  - Multi stage builds
  - Embedding version in the executable
- Working with time
  - Including time.After & friends
  - Time zones
- Formatted output using fmt
  - %q, %v, %+v, %#v verbs and others