

Concurrent Programming with Go

Concurrency Patterns



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Course Overview

Integration

Messaging

Threads

Theory



Who is this Course For?

Learning Go

Systems
Developer

Explorer



The Go Programming Language

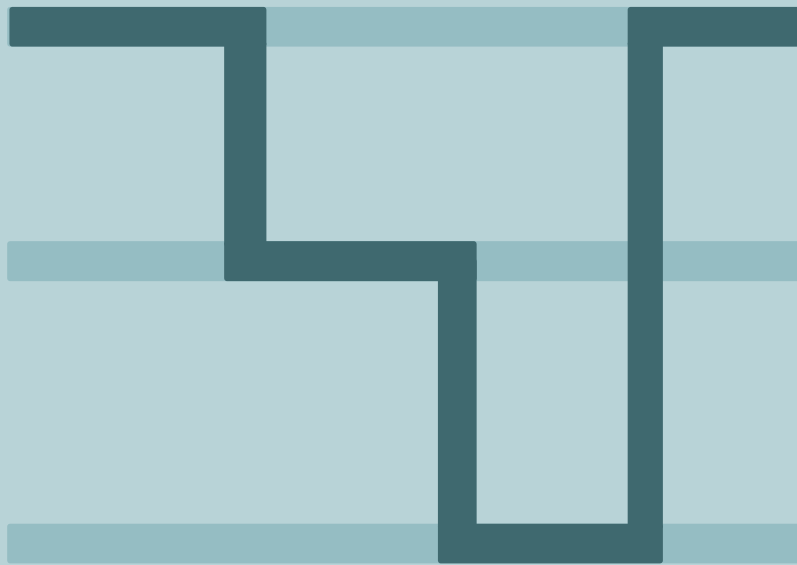
John Sonmez



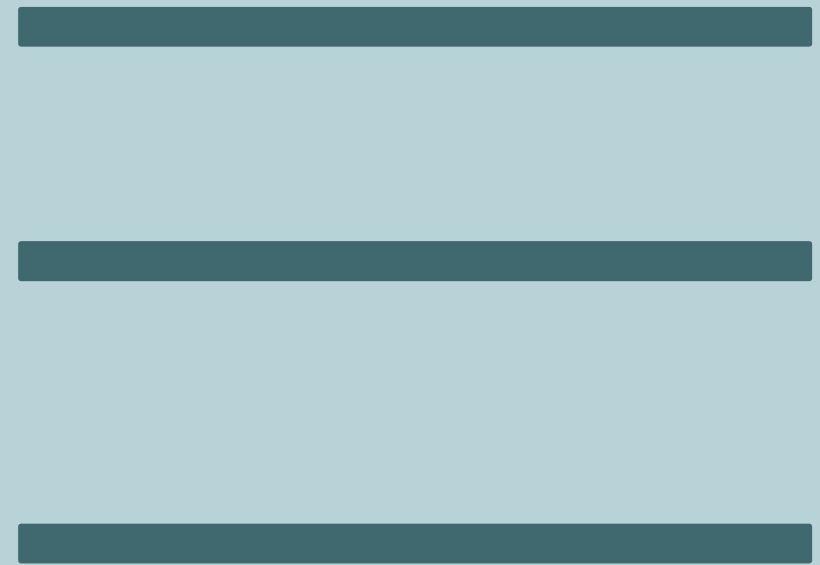
Creating Web Applications with Go

Mike Van Sickle

Concurrent



Parallel



Concurrency Models

A young man with dark hair, wearing a black t-shirt, is shown from the chest up, looking upwards and to the right with a thoughtful expression, his hand resting on his chin. The background is a chalkboard covered in various hand-drawn sketches and diagrams. These include a stack of papers, arrows indicating flow, a smartphone, a group of stick figures, a newspaper labeled 'News', and the words 'phone', 'Tdea', and 'real' written in cursive.

Processor Threads

Events

Callbacks and Promises

Communicating Sequential Processes

Concurrency Models

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Process

Mutex, ...

Thread

Advantages

Control

Performance (maybe)

Responsive User Interface



Disadvantages

Poor Performance

Memory Consumption

Shared Memory

Race Conditions

Concurrency Models

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Emitter

The diagram illustrates the Event Emitter pattern with three light blue oval nodes. The 'Emitter' node is on the left, the 'Event Object' node is on the top right, and the 'Receiver' node is at the bottom center. A bright light source in the top left corner emits several rays of light across the dark blue background, which is also decorated with small star-like light effects.

Event
Object

Receiver



Advantages

Memory Isolation

Separate Callee from Caller



Disadvantages

Traceability

Synchronizing Receivers

Concurrency Models

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Advantages

Memory Isolation

Simplify Async Operations



Disadvantages

Pyramid of Doom

Handling Multiple Receivers

Concurrency Models

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Actor



Message



Advantages

Fully Decoupled

Multiple Handlers

Memory Isolation

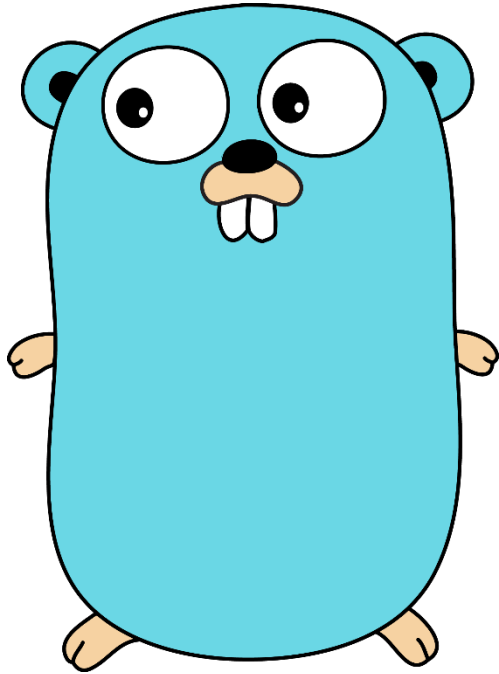


Disadvantages

Complicated Mental Model

Traceability

Concurrency in Go



No Thread Primitives

Goroutines

Channels

Review of Dev Env

Summary

Concurrency Strategies

Go's Concurrency Model

