Welcome Gophers!

What You Need to Know

- Questions during this workshop should be directed to the Teams chat or the Discord channel associated with your instructor.
- Please ask for permission before sharing your screen.
  - If you are on a Mac, sharing your screen may only be possible if your update your Mac's security and privacy settings. Go to the Apple menu > System Preferences, click Security & Privacy, then click Privacy and select Microsoft Teams.
- Breaks will be given near the top of every hour. During the break, a timer will be displayed so you are aware when the session will continue.
- If you are experiencing streaming issues, exit Teams, restart your computer, and then re-enter the workshop. In the case quality issues persist, please take note of the TA's email address located in the bottom right of this screen.
- This workshop is being recorded! If you don't want to be recorded for privacy reasons, don't share your camera and microphone.

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Google

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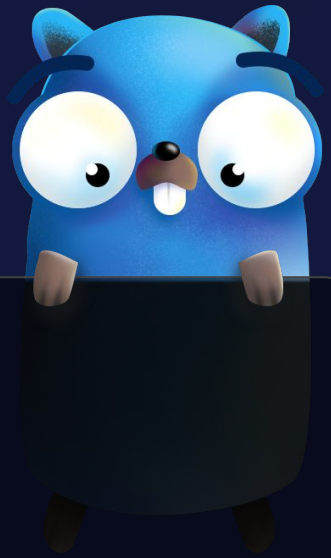
Code blocks example



```
package main
import(
“fmt”
)

func main(){
      fmt.Println(“This is Cool”)
}
```

Go Jumpstart

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Synopsis

Want to get a jumpstart learning Go? Maybe you are a systems integrator that is more of a scriptor than a developer? Or maybe you'd like to take a fresh look at Go from the beginning. The goal of this workshop is to give you a good foundation on which to build your Go development skills. We will cover the fundamentals of Go to help you boost your programming productivity out of the gate. The two-day course seeks to teach the language by reviewing and discussing source code line by line.

Schedule Day One

Setup Go Background (12 to 12:45)	Workstation setup (Go, IDE), your first app, language overview and exercises
Hello World (1 - 1:45)	Basic structure of a .go file. Run and compile a basic program
Roadwork (2 -2:45)	Look at how some basic things are constructed and create an http service
Roadwork (3 -3:45)	Let's write some code together
Bonus and Overflow 4-5	We will be available to answer questions, have general discussions and plan tomorrow's sessions

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Workstation setup

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Setup Go

- Install Go for your platform from https://golang.org/dl/

IDE Install Your Favorite IDE

- **Atom** - https://atom.io
- **Visual Studio Code** - https://code.visualstudio.com/ (Recommended for Beginners)
- **Goland** - https://www.jetbrains.com/go/specials/go/go.html?dclid=CJzE5LDG4NwCFeVuwQodWy4Pow
- **LiteIde** - https://github.com/visualfc/liteide
- **VIM** - https://github.com/fatih/vim-go
- **Emacs** - https://github.com/dominikh/go-mode.el

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Explore Go commands

The commands are:

bug	start a bug report
build	compile packages and dependencies
clean	remove object files and cached files
doc	show documentation for package or symbol
env	print Go environment information
fix	update packages to use new APIs
fmt	gofmt (reformat) package sources
generate	generate Go files by processing source
get	download and install packages and dependencies
install	compile and install packages and dependencies
list	list packages or modules
mod	module maintenance
run	compile and run Go program
test	test packages
tool	run specified go tool
version	print Go version
vet	report likely mistakes in packages

Getting the samples code and slides

Commands

- cd <<clone location>>
- git clone https://github.com/goog-lukemc/gotrain
- Slide and docs are in gotrain/assets
- Source is in gcp-train/<various folders>

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Background

02

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History

Who

Robert Griesemer
Rob Pike
Ken Thompson

Why

Combine the ease of a dynamic type language with the safety of the static type system.
https://golang.org/doc/faq#Is_Go_an_object-oriented_language
https://golang.org/doc/effective_go.html
https://golang.org/doc/code.html

Where are we now

1.15.4 Nov 2020
https://golang.org/dl/

More info

https://talks.golang.org/2012/splash.article
https://tip.golang.org/doc/go1.11
https://golang.org/doc/devel/release.html
https://talks.golang.org/2015/gophercon-goevolution.slide#8
https://golang.org/doc/faq

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What's cool about Go (top 3)

Concurrency: (tomorrow)

- Concurrency is not parallelism (https://www.youtube.com/watch?v=cN_DpYBzKso)
- Concurrency is about having the best design to maximize parallelism if it is available.

Interfaces: (tomorrow)

- We will do an overview of design and implementation Monday

Portability: (today)

- Go is not runtime interpreted (There is nothing to install on the target to execute a Go program.)
- A simple build switch can build the executable for any supported platform.

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Go Is Good for?

Coders	Writing code to solve the problem in front of you. Slinging code - having fun!
Developers	Writing code to solve a problem for generic reuse. Writing small - having fun!
Idiomatic	What is this anyway? https://golang.org/doc/effective_go.html, https://golang.org/doc/code.html, https://github.com/golang/go/wiki/CodeReviewComments

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Hello, World

03

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~/gcp-train/hello

Review: main.go (In Editor)

Build: main.go (In Editor)

Build for any platform from any platform:

- **Pi:** `env GOOS=linux GOARCH=arm go build -v main.go -o program-arm`
- **MAC:** `env GOOS=darwin GOARCH=amd64 go build -v main.go -o program-mac-amd64`
- **Windows:** `env GOOS=windows GOARCH=amd64 go build -v main.go -o program-windows-amd64.exe`

Running the file: go run main.go

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~/gcp-train/hello_flag

Review: main.go (In Editor)

Build: main.go (In Editor)

Build for any platform from any platform:

- **Pi:** `env GOOS=linux GOARCH=arm go build -v main.go -o program-arm`
- **MAC:** `env GOOS=darwin GOARCH=amd64 go build -v main.go -o program-mac-amd64`
- **Windows:** `env GOOS=windows GOARCH=amd64 go build -v main.go -o program-windows-amd64.exe`

Running the file and flow testing: go run main.go

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~/gcp-train/hello_struct

Review: main.go (In Editor)

Build: main.go (In Editor)

Build for any platform from any platform:

- **Pi:** `env GOOS=linux GOARCH=arm go build -v main.go -o program-arm`
- **MAC:** `env GOOS=darwin GOARCH=amd64 go build -v main.go -o program-mac-amd64`
- **Windows:** `env GOOS=windows GOARCH=amd64 go build -v main.go -o program-windows-amd64.exe`

Running the file and flow testing:

- go build
- go run main.go

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The basics

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errors ~/gcp-train/errors

Review: main.go (In Editor)

Build for any platform from any platform:

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- **MAC:** `env GOOS=darwin GOARCH=amd64 go build -v main.go -o program-mac-amd64`
- **Windows:** `env GOOS=windows GOARCH=amd64 go build -v main.go -o program-windows-amd64.exe`

Running the file and flow testing: go run main.go

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basic ~/gcp-train/basics

Review: main.go (In Editor)

Build for any platform from any platform:

- **Pi:** `env GOOS=linux GOARCH=arm go build -v main.go -o program-arm`
- **MAC:** `env GOOS=darwin GOARCH=amd64 go build -v main.go -o program-mac-amd64`
- **Windows:** `env GOOS=windows GOARCH=amd64 go build -v main.go -o program-windows-amd64.exe`

Running the file and flow testing: go run main.go

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basic ~/gcp-train/asciicoolness

Review: main.go (In Editor)

Build for any platform from any platform:

- **Pi:** `env GOOS=linux GOARCH=arm go build -v main.go -o program-arm`
- **MAC:** `env GOOS=darwin GOARCH=amd64 go build -v main.go -o program-mac-amd64`
- **Windows:** `env GOOS=windows GOARCH=amd64 go build -v main.go -o program-windows-amd64.exe`

Running the file and flow testing: go run main.go

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basic ~/gcp-train/basichttpserver

Review: main.go (In Editor)

Build for any platform from any platform:

- **Pi:** `env GOOS=linux GOARCH=arm go build -v main.go -o program-arm`
- **MAC:** `env GOOS=darwin GOARCH=amd64 go build -v main.go -o program-mac-amd64`
- **Windows:** `env GOOS=windows GOARCH=amd64 go build -v main.go -o program-windows-amd64.exe`

Running the file and flow testing: go run main.go

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Practical Work

Go Cloud Libs:
https://github.com/googleapis/google-cloud-go

How to submit bugs and contribute
https://github.com/golang/go/blob/master/CONTRIBUTING.md

Language Spec
https://golang.org/ref/spec

Effective Go
https://golang.org/doc/effective_go.html

When to Panic
https://eli.thegreenplace.net/2018/on-the-uses-and-misuses-of-panics-in-go/

Testing

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test ~/gcp-train/onetest

Review: main.go (In Editor) and main_test.go (In Editor)

Build for any platform from any platform:

- **Pi:** `env GOOS=linux GOARCH=arm go build -v main.go -o program-arm`
- **MAC:** `env GOOS=darwin GOARCH=amd64 go build -v main.go -o program-mac-amd64`
- **Windows:** `env GOOS=windows GOARCH=amd64 go build -v main.go -o program-windows-amd64.exe`

Running the tests:

- `go test`

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test ~/gcp-train/twotest

Review: main.go (In Editor) and main_test.go (In Editor)

Build for any platform from any platform:

- **Pi:** `env GOOS=linux GOARCH=arm go build -v main.go -o program-arm`
- **MAC:** `env GOOS=darwin GOARCH=amd64 go build -v main.go -o program-mac-amd64`
- **Windows:** `env GOOS=windows GOARCH=amd64 go build -v main.go -o program-windows-amd64.exe`

Running the tests:

- `go test`

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test ~/gcp-train/awesomeexample

Review: awesome.go (In Editor) and example_awesome_test.go (In Editor)

Build for any platform from any platform:

- **Pi:** `env GOOS=linux GOARCH=arm go build -v main.go -o program-arm`
- **MAC:** `env GOOS=darwin GOARCH=amd64 go build -v main.go -o program-mac-amd64`
- **Windows:** `env GOOS=windows GOARCH=amd64 go build -v main.go -o program-windows-amd64.exe`

Running the test and doc server:

- `go test`
- `godoc -http=:8080`

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Concurrency

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concurrency ~/gcp-train/basichttpserver

Review: main.go (In Editor)

Build for any platform from any platform:

- **Pi:** `env GOOS=linux GOARCH=arm go build -v main.go -o program-arm`
- **MAC:** `env GOOS=darwin GOARCH=amd64 go build -v main.go -o program-mac-amd64`
- **Windows:** `env GOOS=windows GOARCH=amd64 go build -v main.go -o program-windows-amd64.exe`

Running the file and flow testing: go run main.go

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concurrency ~/gotrain/sametime ~/gotrain/mutex ~/gotrain/sametime

Review: main.go (In Editor)

Build for any platform from any platform:

- **Pi:** `env GOOS=linux GOARCH=arm go build -v main.go -o program-arm`
- **MAC:** `env GOOS=darwin GOARCH=amd64 go build -v main.go -o program-mac-amd64`
- **Windows:** `env GOOS=windows GOARCH=amd64 go build -v main.go -o program-windows-amd64.exe`

Running the file and flow testing: go run main.go

Interfaces

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Interfaces

Web links

- https://gobyexample.com/interfaces
- https://medium.com/golangspec/interfaces-in-go-part-i-4ae53a97479c

Let's do some code review

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Testing

Let’s make something TDD style

Survey: https://goo.gl/forms/tj22llUtigE0DfHP2

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We done

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