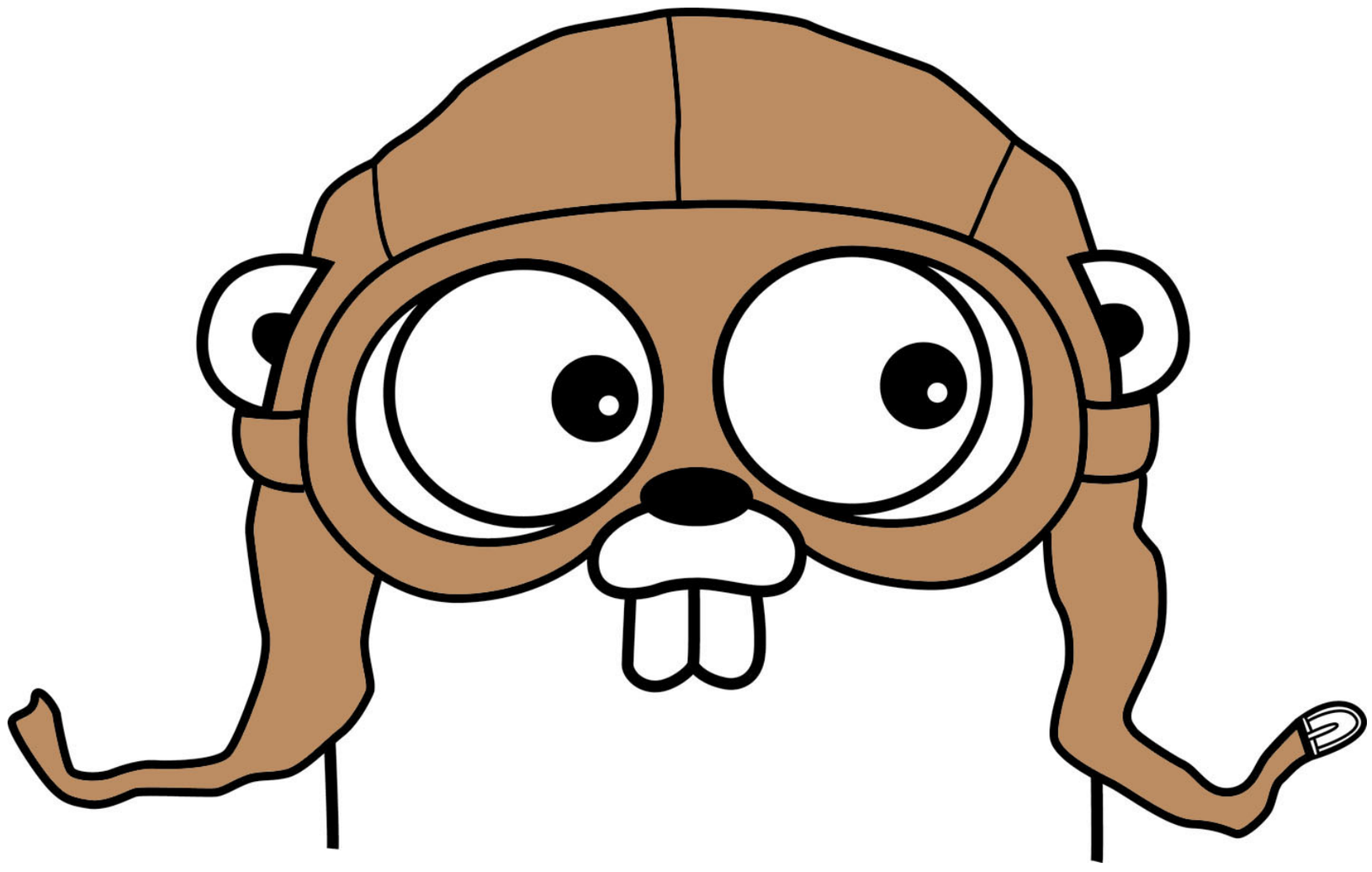
GET GO-ING WITH A NEW LANGUAGE



KAT ZIEŃ (@KASIAZIEN)

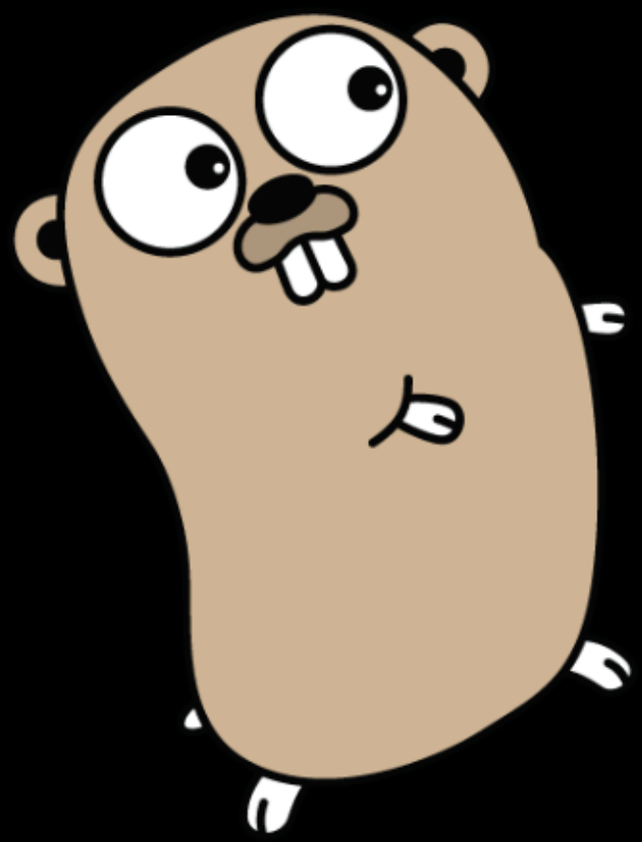
SCOTLAND PHP 6 OCTOBER 2018

IMAGE BY RENEE FRENCH

MADE BY IAN BAKER

GO(LANG)

DIFFERENCES



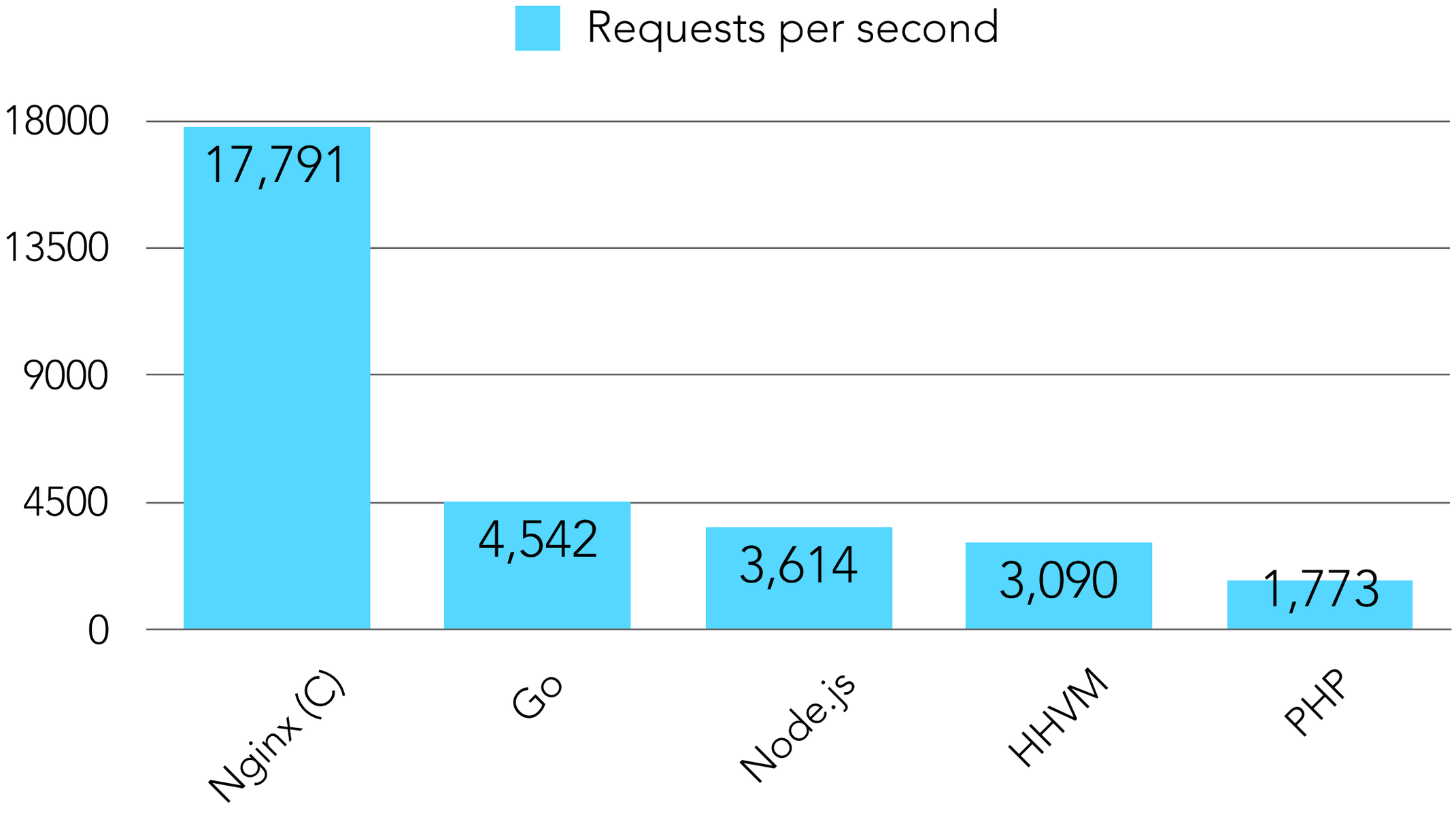
DIFFERENCES

DIFFERENCES

INTERPRETED VS COMPILED

IMAGE FROM COMPILERS - PRINCIPLES, TECHNIQUES AND TOOLS

BENCHMARKS



SOURCE: HTTPS://DAN.HERSAM.COM/2015/02/25/GO-VS-NODE-VS-PHP-VS-HHVM-AND-WORDPRESS-BENCHMARKS/

```go
package main

import (
    "fmt"
    "math/rand"
)

func main() {
    var greeting string = "Hello! Is it %s you're looking for?\n"
    words := [2]string{"me", "tea"}

    rand.Seed(42)

    for i := 0; i < 5; i++ {
        fmt.Printf(greeting, words[rand.Intn(len(words))])
    }
}
```

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    for i := 0; i < 5; i++ {
        fmt.Printf(greeting, words[rand.Intn(len(words))])
    }
}
```

```
$ go run lionel.go
Hello! Is it tea you're looking for?
Hello! Is it me you're looking for?
Hello! Is it me you're looking for?
Hello! Is it tea you're looking for?
```

```
$ go build lionel.go

$ ls
lionel     lionel.go

$ ./lionel

Hello! Is it tea you're looking for?
Hello! Is it tea you're looking for?
Hello! Is it me you're looking for?
Hello! Is it me you're looking for?
Hello! Is it tea you're looking for?
```

TOOLS

OUT OF THE BOX

IMAGE FROM LEGO.COM

GOPATH

```
$GOPATH/src/<vendor>/<project-name>
```

e.g.

```
/Users/Kat/go-code/src/gitlab.com/katzien/hello

/Users/Kat/go-code/src/github.com/golang/go
```

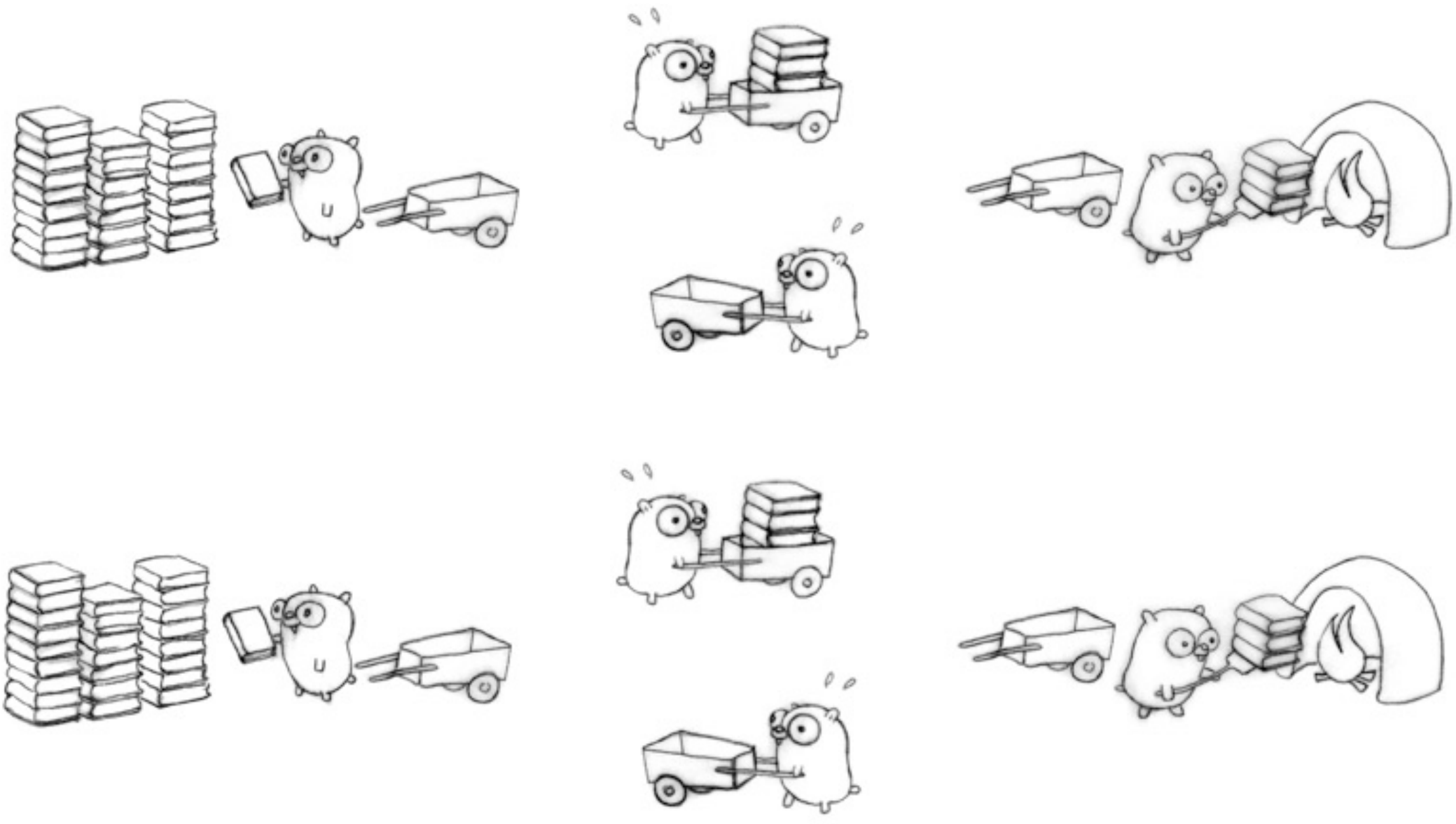
IMAGE FROM LEGO.COM

CONCURRENCY VS PARALLELISM

Concurrency: two threads are making progress

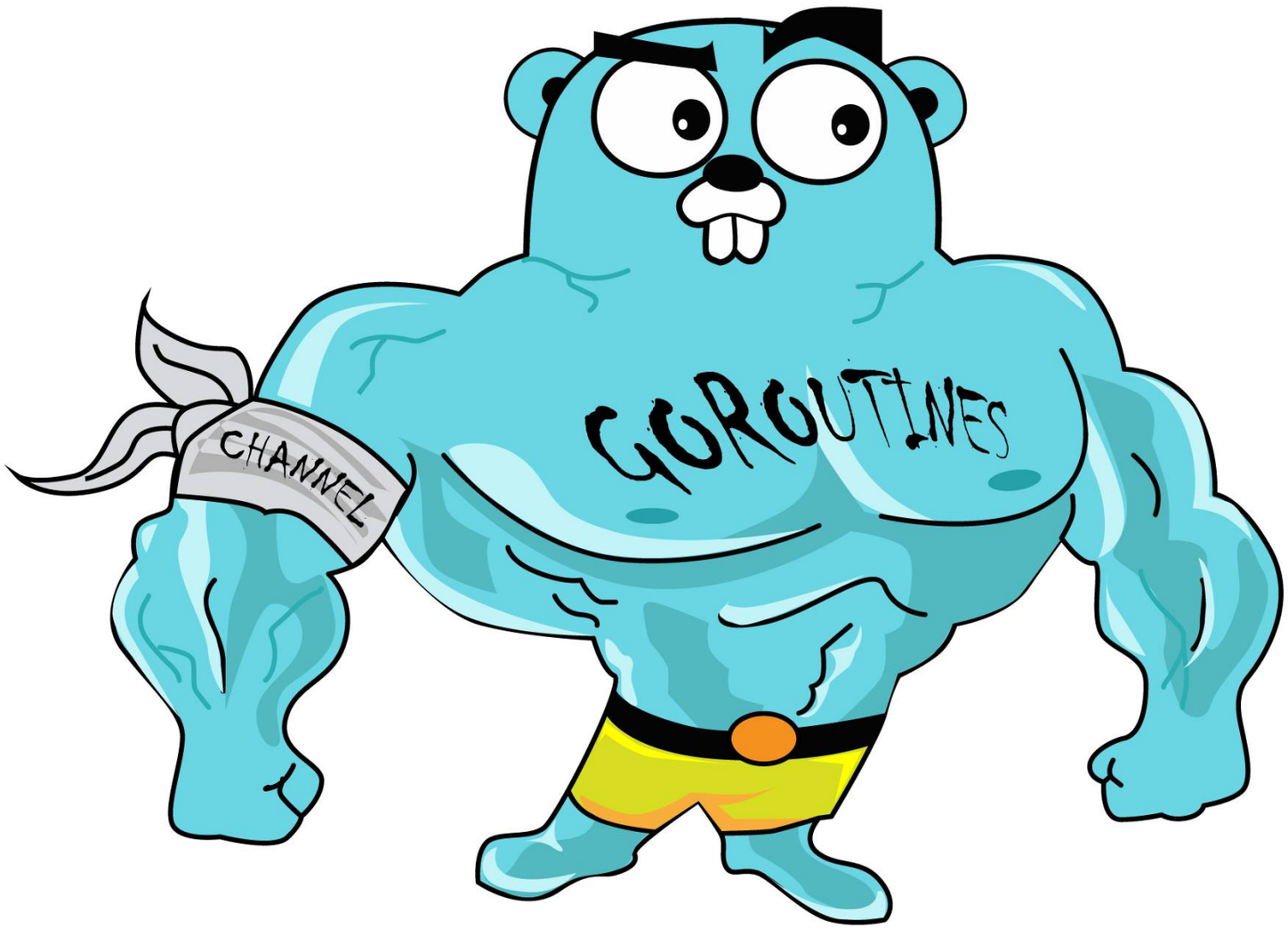
Parallelism: two threads are executing simultaneously

CONCURRENCY != PARALLELISM



SOURCE: HTTPS://TALKS.GOLANG.ORG/2012/WAZA.SLIDE#22

BUILT-IN CONCURRENCY



GOROUTINES

```
go myFunction()
```

```go
func say(word string) {
    for i := 0; i < 5; i++ {
        time.Sleep(10 * time.Millisecond)
        fmt.Println(word)
    }
}
```

```go
func main() {
    go say("world")
    say("hello")
}
```

```go
func say(word string) {
    for i := 0; i < 5; i++ {
        time.Sleep(10 * time.Millisecond)
        fmt.Println(word)
    }
}
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func main() {
    go say("world")
    say("hello")
}
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    for i := 0; i < 5; i++ {
        time.Sleep(10 * time.Millisecond)
        fmt.Println(word)
    }
}
```

```go
func main() {
    go say("world")
    say("hello")
}
```

```
$ go run goroutines.go

world
hello
world
hello
world
world
hello
world
hello
```

```
$ go run goroutines.go

world      world      hello      world
hello      hello      world      hello
world      hello      hello      world
hello      world      world      hello
hello      hello      world      world
world      world      hello      hello
world      hello      hello      hello
hello      world      world      world
world      world      hello      world
hello      hello      world      hello
```

```
$ go run goroutines.go

world      world      hello      world
hello      hello      world      hello
world      hello      hello      world
hello      world      world      hello
hello      hello      world      world
world      world      hello      hello
world      hello      hello      hello
hello      world      world      world
world      world      hello      world
hello      hello      world      hello
```

```
func main() {
    wg := sync.WaitGroup{}
    wg.Add(1)

    go func() {
        defer wg.Done()
        say("world")
    }()

    say(“hello")

    wg.Wait()
    fmt.Println("Done!")
}
```

```
func main() {
    wg := sync.WaitGroup{}
    wg.Add(1)

    go func() {
        defer wg.Done()
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    }()

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func main() {
    wg := sync.WaitGroup{}
    wg.Add(1)

    go func() {
        defer wg.Done()
        say("world")
    }()

    say(“hello")

    wg.Wait()
    fmt.Println("Done!")
}
```

CHANNELS

CHANNELS

```
var messenger chan string
messenger = make(chan string)
```

```
// Send value to channel
messenger <- "Ohai!"


// Receive from channel and assign to variable
message := <-messenger
```

```
jobs := make(chan Task)
```

```
for n := limit; n > 0; n-- {
    go func() {
        for task := range jobs {
            do(task)
        }
    }()
}
```

```
for _, task := range workSlice {
    jobs <- task
}
```

WE CAN SPEED THINGS UP

IMAGE FROM HTTP://ENGLISH.SINA.COM/SPORTS/P/2011/0519/374212.HTML

NEITHER IS BETTER OR WORSE: THEY'RE JUST DIFFERENT

IMAGE FROM HTTP://COGDOGBLOG.COM/2014/11/US-N-MACHINES

FAVOURITE THINGS

PHP

- quick to get things done
- mature frameworks and libraries
- PHP 7
- types are coming 🎉

GO

- strong types
- keeping things simple
- error checking policy
- multiple return values
- interfaces
- built-in tools
- easy to run
- concurrency
- speed

NOT IDEAL

PHP

- inconsistency
- type juggling
- no dead code checking
- bit verbose?

GO

- less mature ecosystem
- dependency management
- “Ugh, do I really have to write it from scratch?”

FROM PHP TO GO AND BACK:

DID ANYTHING CHANGE?

IMAGE FROM GRACEHOPPERFILM.COM

STRICT TYPES

```php
declare(strict_types=1);
```

SHORTER, SENSIBLE NAMES

```
namespace Controllers;

class HomePage~~Controller~~ { ... }
```

HANDLE ERRORS FIRST

```php
if (!empty($name)) {

    if (!is_string($name)) {
        return false;
    }

    return true;

} else {

    return false;
}
```

```php
if (empty($name)) {
    return false;
}

if (!is_string($name)) {
    return false;
}

return true;
```

INTERFACES

Go's implicit interfaces:

has a, rather than *is a*

If a struct **has** methods A, B, C, then it implements interface X.

If an object **is** of type X, then it has methods A, B, C.

INTERFACES

GO

```
type Shape interface {
    Area() float64
}
```

INTERFACES

GO

```
type Shape interface {
    Area() float64
}
type Circle struct {
    radius float64
}
```

```
func (c Circle) Area() float64 {
    return math.Pi * c.radius * c.radius
}
```

INTERFACES

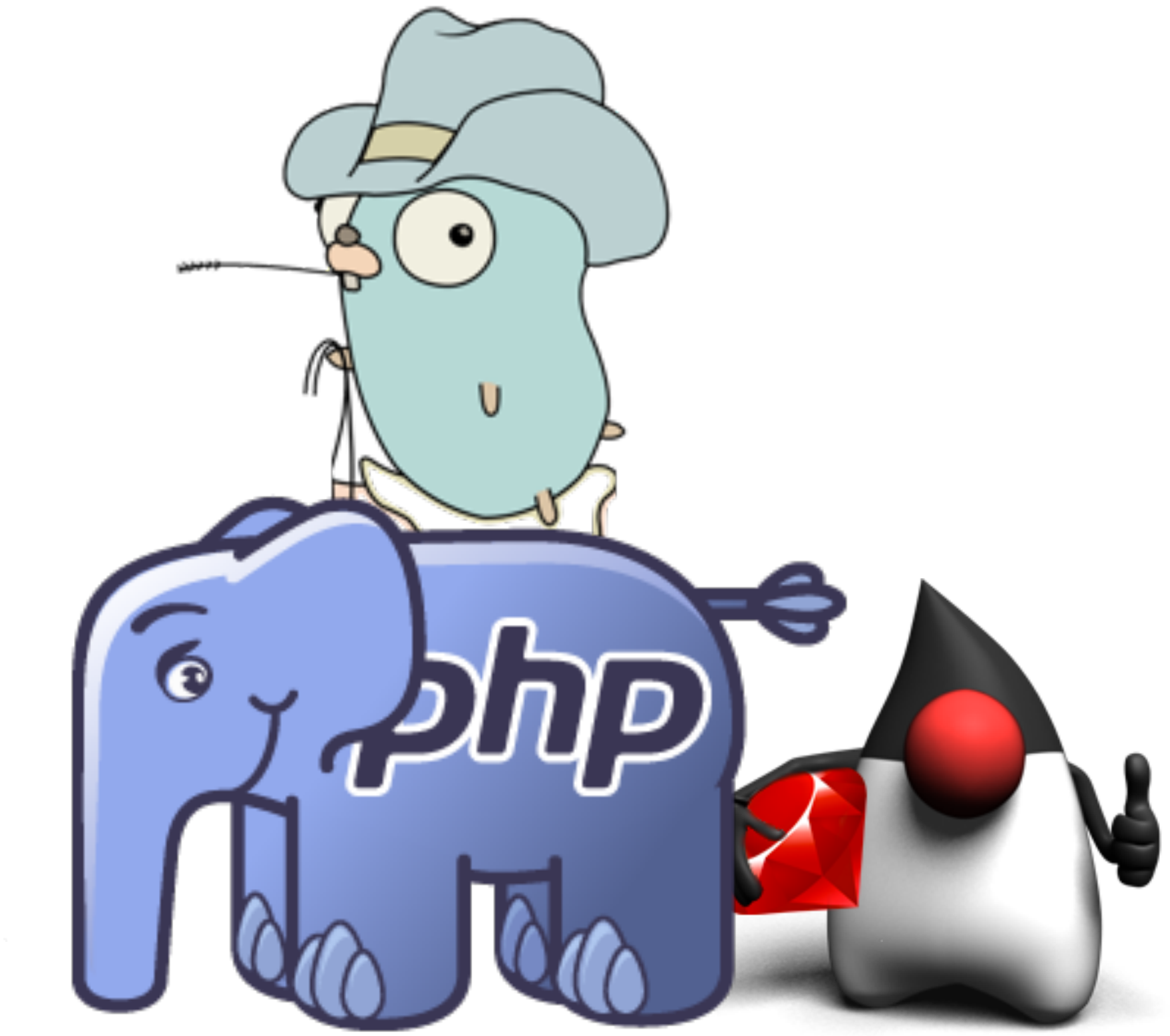
GO

```go
type Shape interface {
    Area() float64
}
type Circle struct {
    radius float64
}
```

```go
func (c Circle) Area() float64 {
    return math.Pi * c.radius * c.radius
}
```

PHP

```php
class Circle implements Shape { ... }
```


php

WHERE DO I START?

https://golang.org/

https://play.golang.org/

https://tour.golang.org/

https://blog.golang.org/

https://gobyexample.com

@KASIAZIEN

TALKS

Concurrency is not parallelism

https://blog.golang.org/concurrency-is-not-parallelism

Simplicity is complicated

https://www.youtube.com/watch?v=rFejpH_tAHM

Building containers in Go

https://www.youtube.com/watch?v=HPuvDm8IC-4

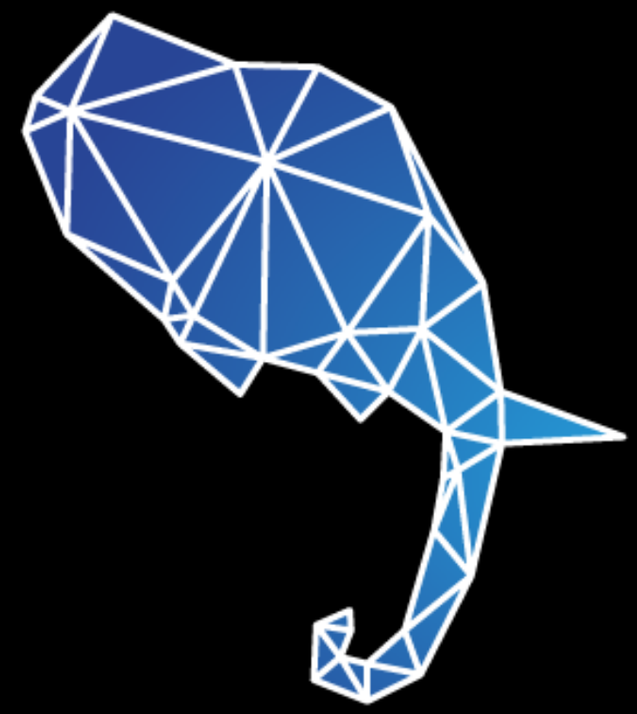
Debuggers From Scratch

https://www.youtube.com/watch?v=ZrpkrMKYvqQ

COMMUNITY

IMAGE FROM @JMIKOLA

THANKS FOR LISTENING!



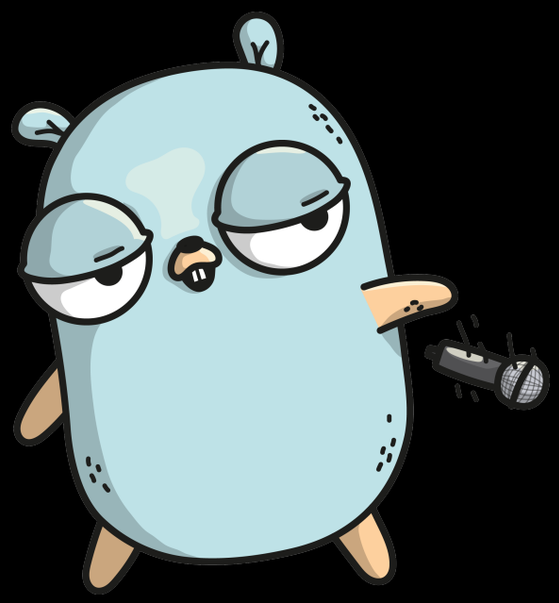


IMAGE BY ASHLEY MCNAMARA

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