

Concurrency in Go



Nigel Poulton

Author & Trainer

@nigelpoulton nigelpoulton.com



Agenda



Explaining concurrency

Concurrency in computer programs

Go's concurrency model

Writing a concurrent program

Channels

Recap



Explaining Concurrency



Concurrency:

Multiple processes executing independently



Concurrency:

Multiple processes executing
independently



Emails

(Active)



Emails

(Sleeping)

Video work

(Active)



Emails

(Sleeping)

Video work

(Sleeping)

Book translation

(Active)



Emails

(Active)

Video work

(Sleeping)

Book translation

(Sleeping)



Emails

(Sleeping)

Video work

(Active)

Book translation

(Sleeping)



Emails

(Sleeping)

Video work

(Sleeping)

Book translation

(Active)



Concurrency:

Lots of tasks “*on the go*”, but only one “*active*”.





Emails

(Sleeping)

Video work

(Sleeping)

Book translation

(Active)





Emails

(Active)

Video work

(Sleeping)

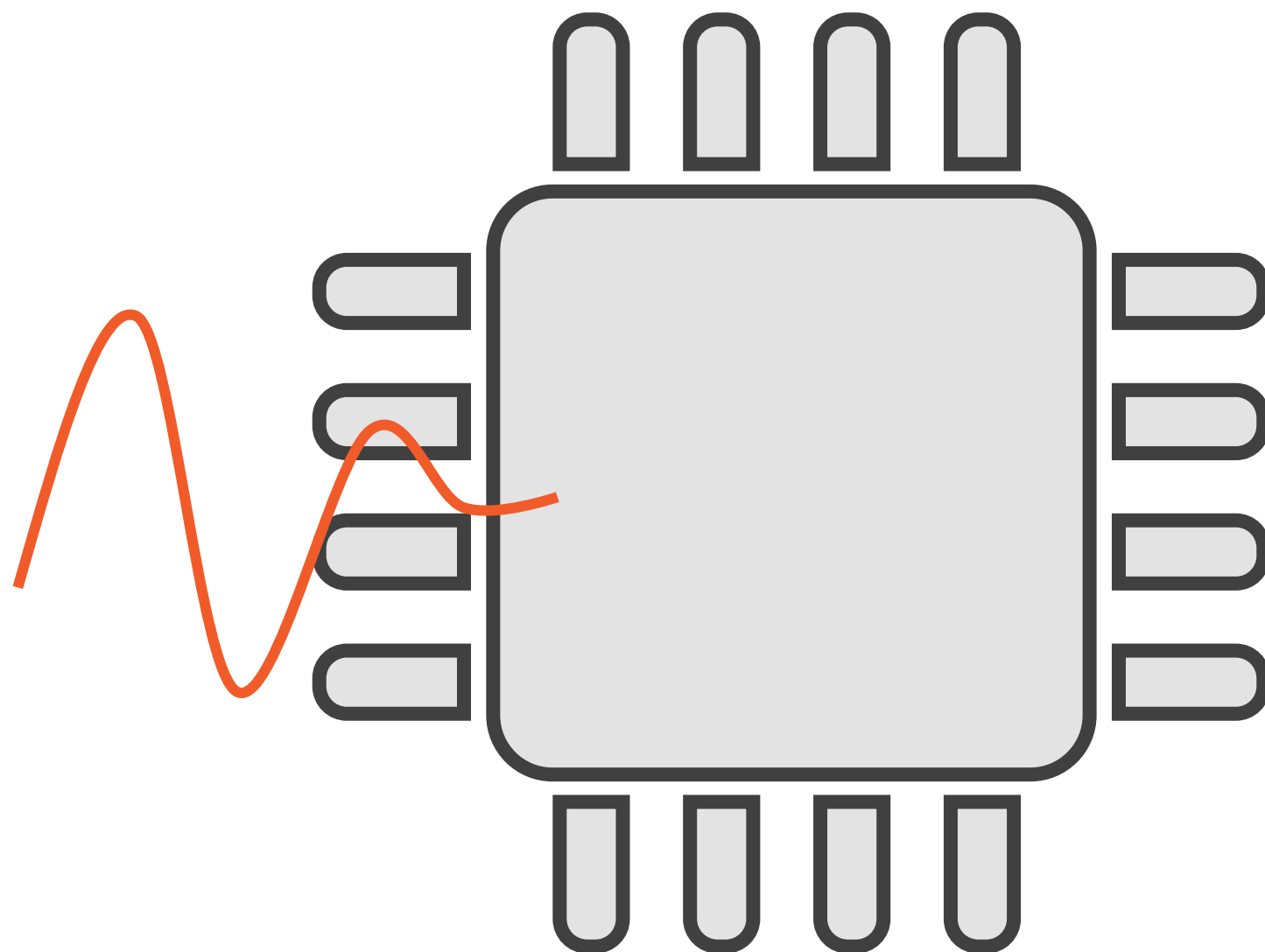
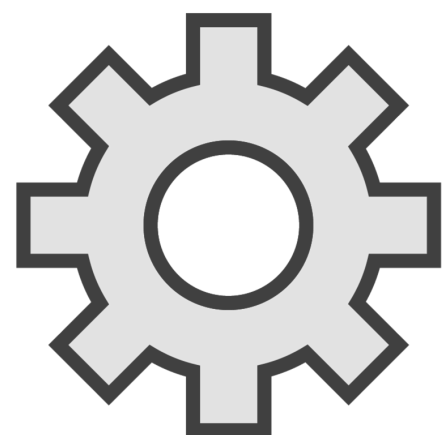
Book translation

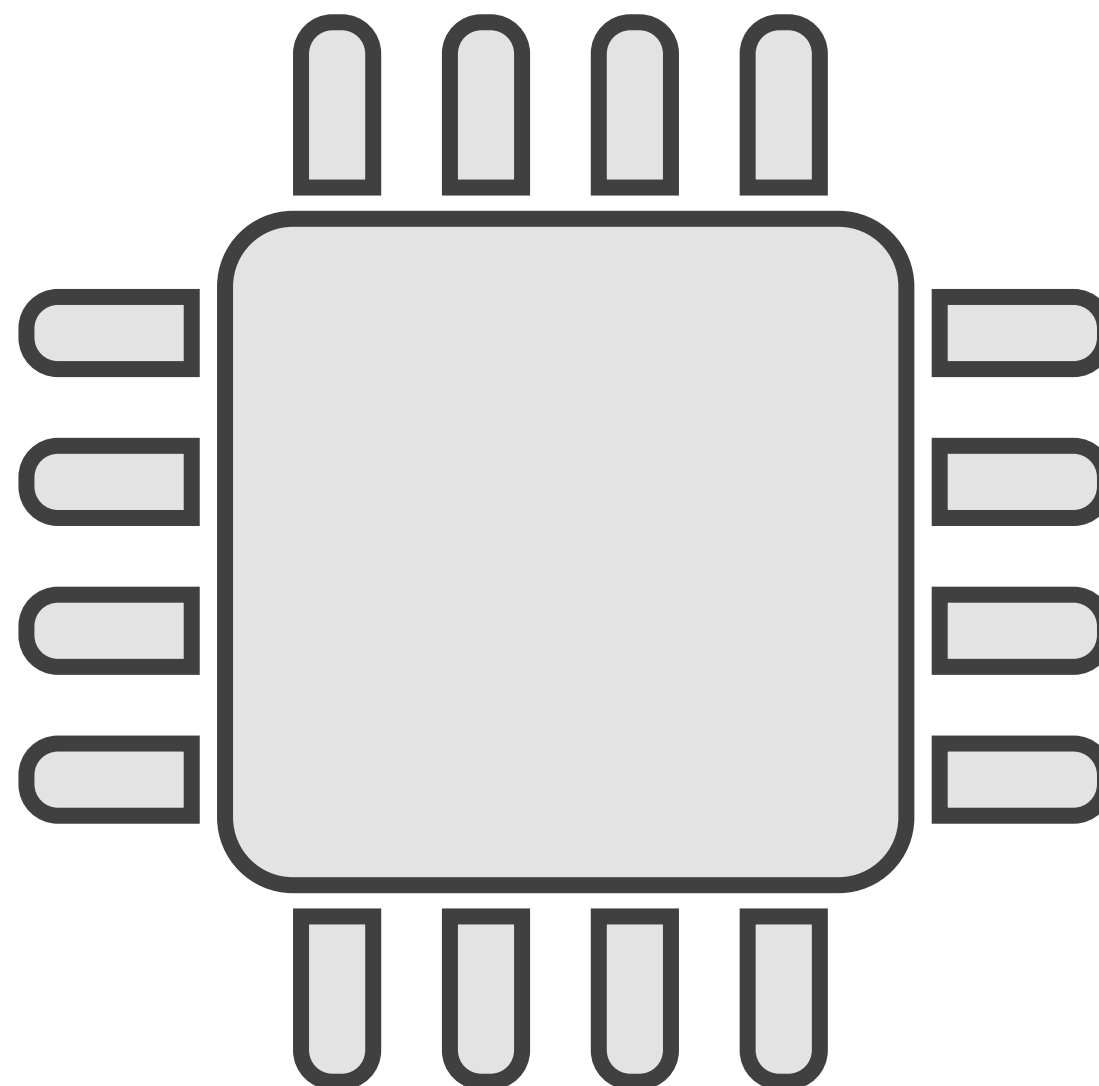
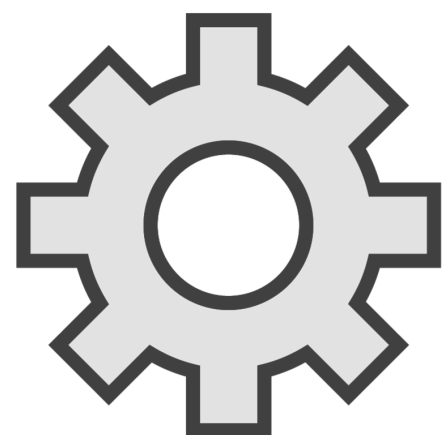
(Sleeping)

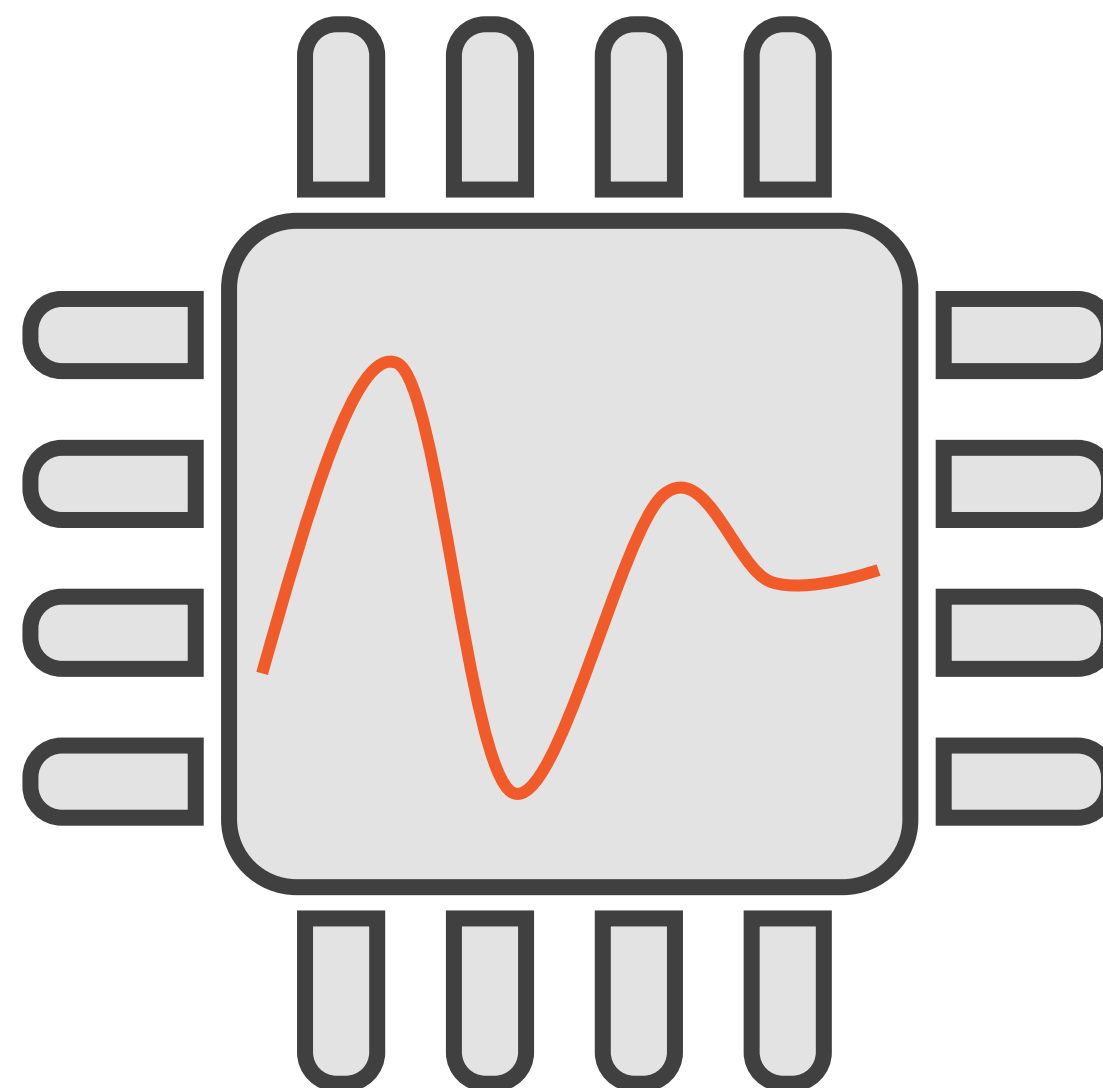
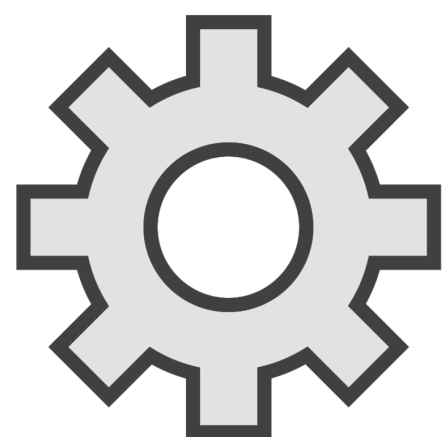


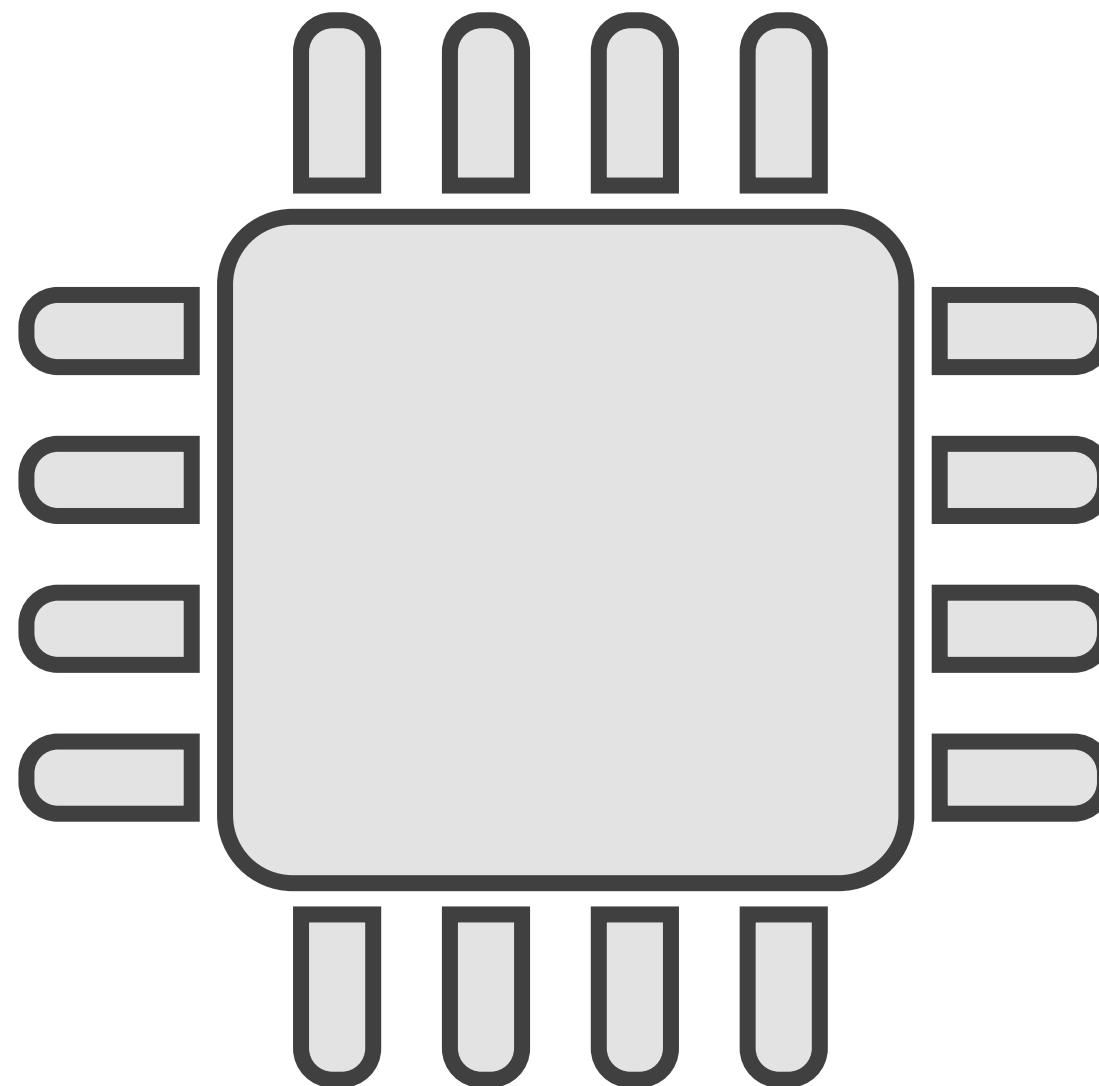
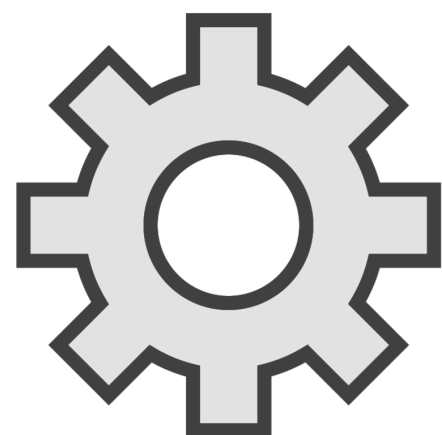
Concurrency in Computer Programs

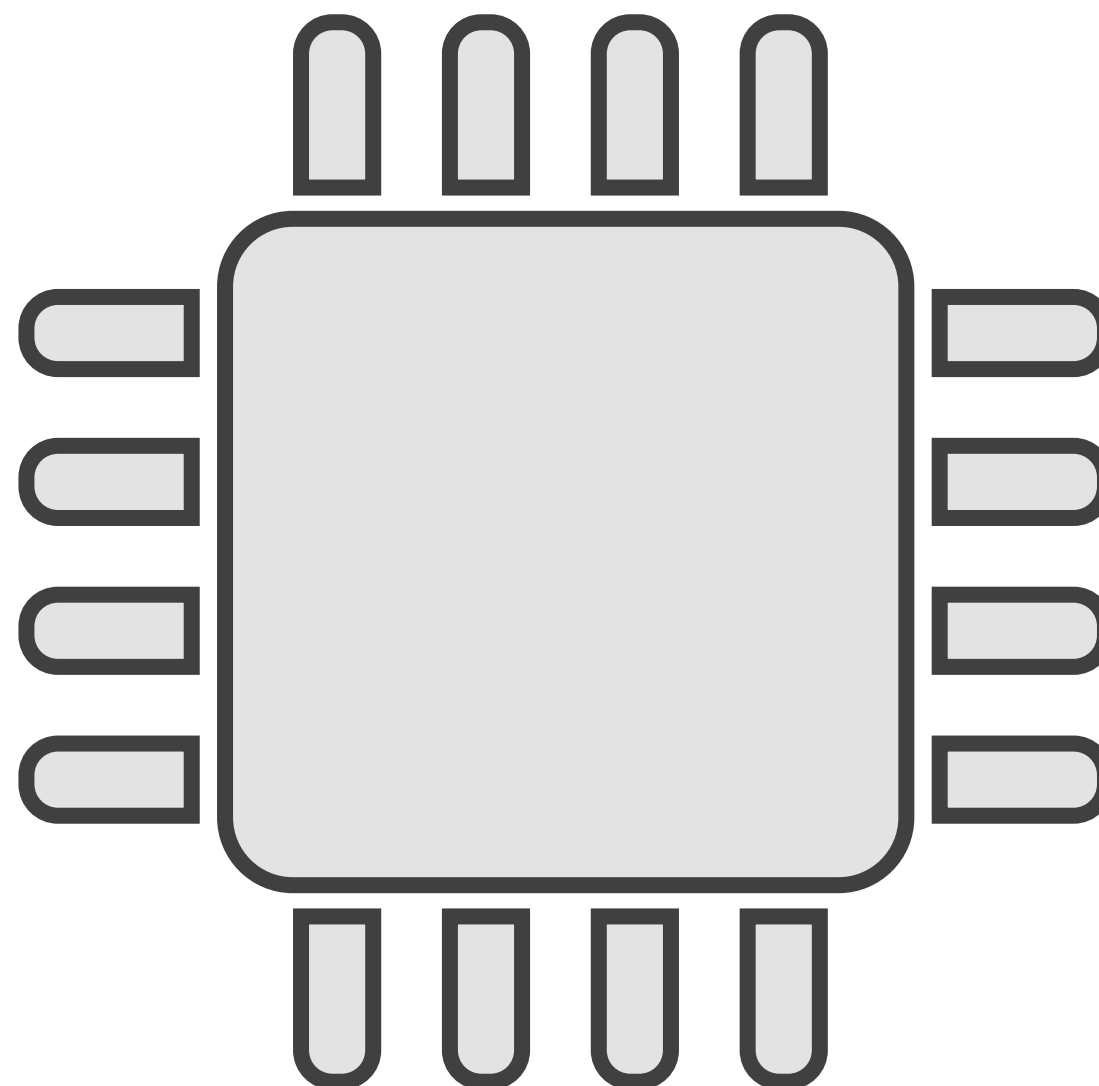
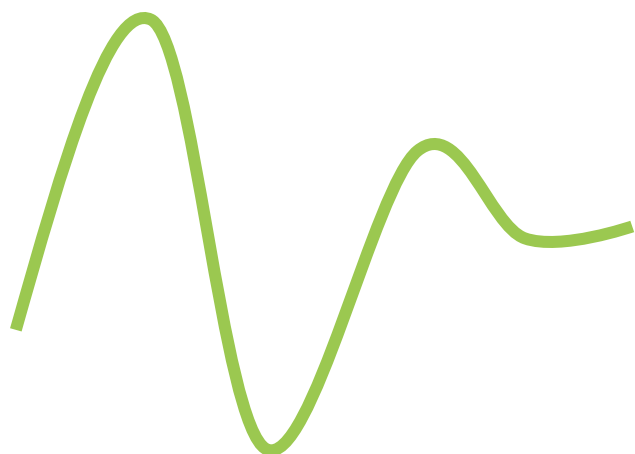
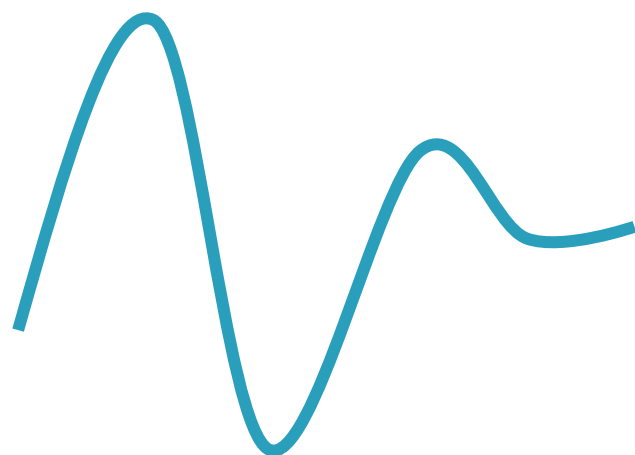
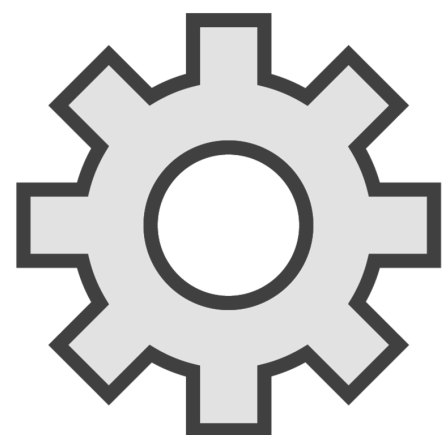


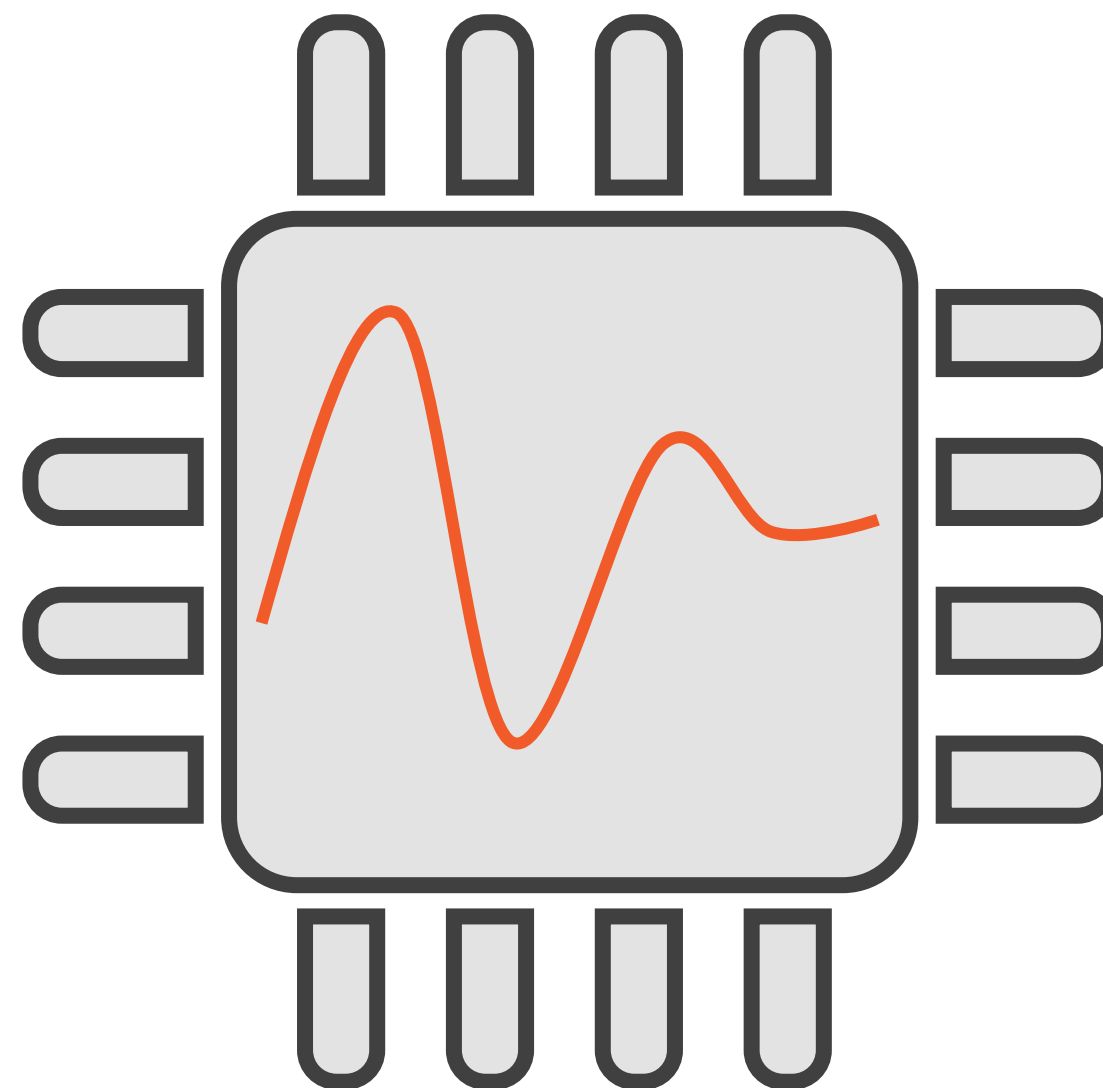
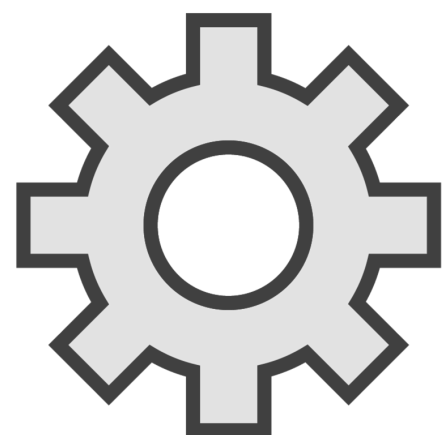


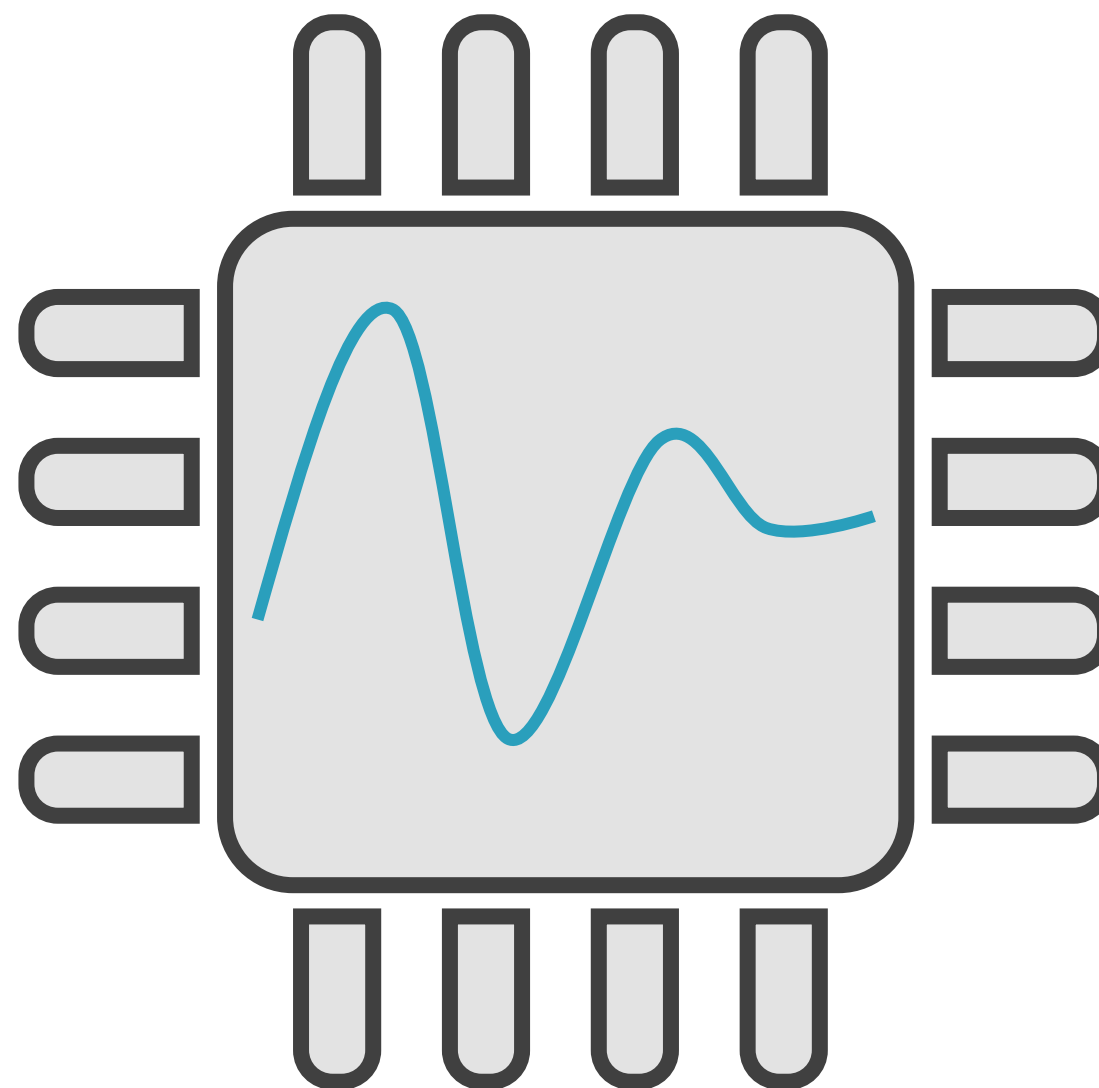
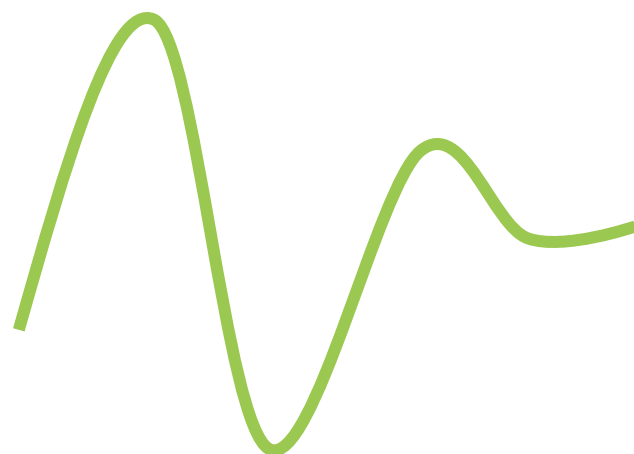
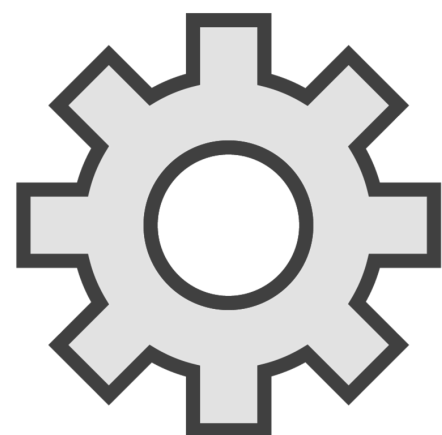
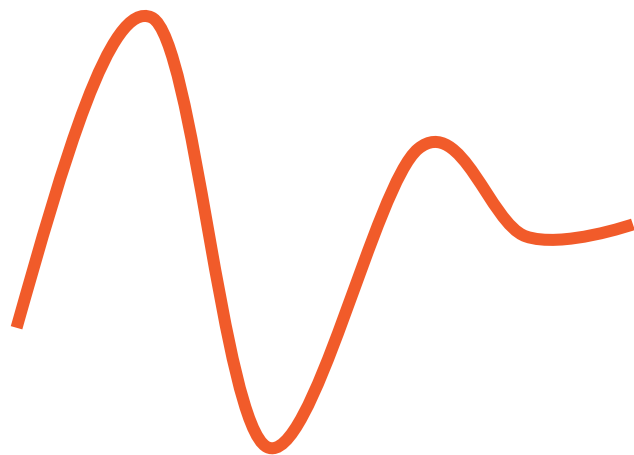


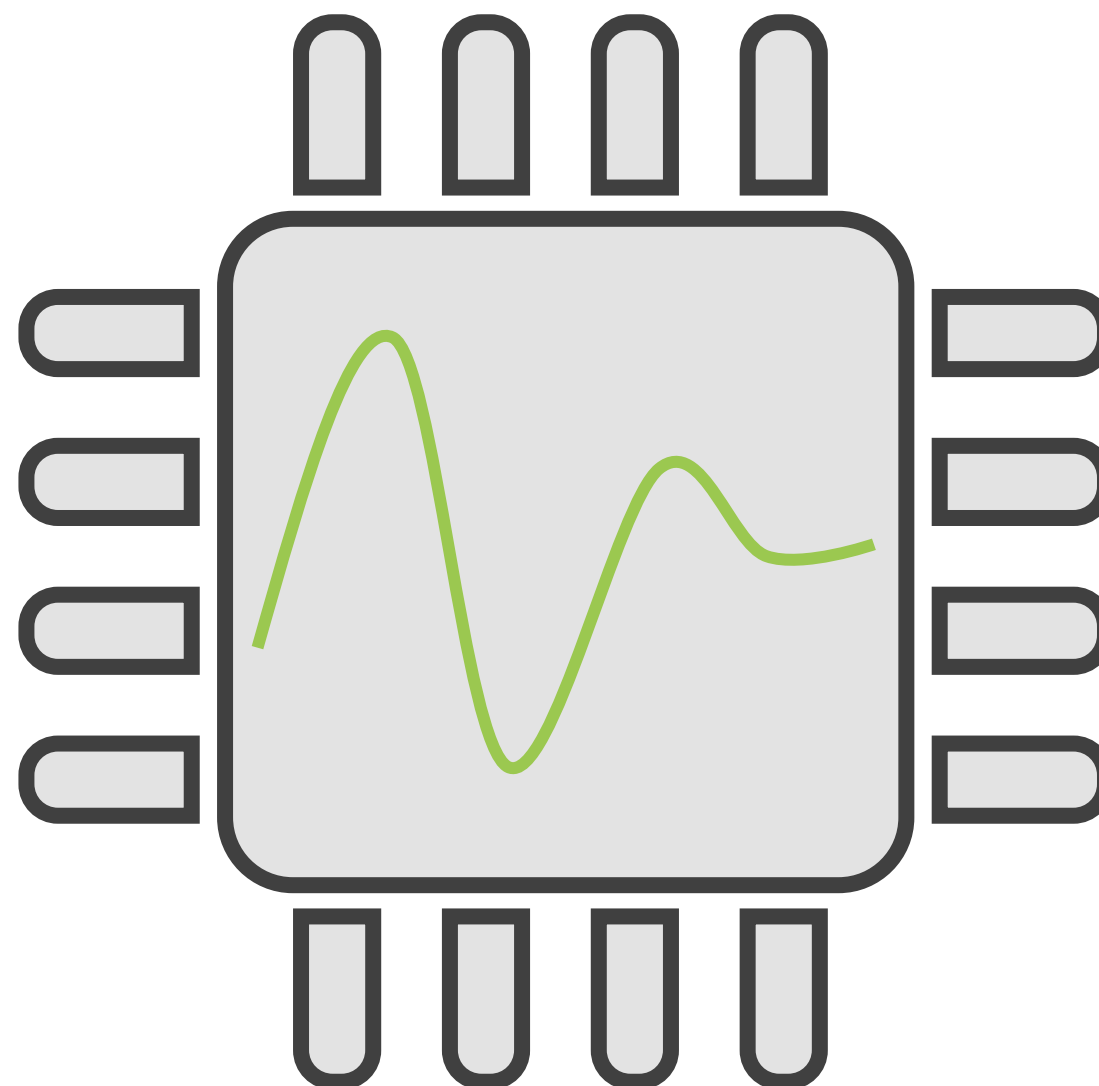
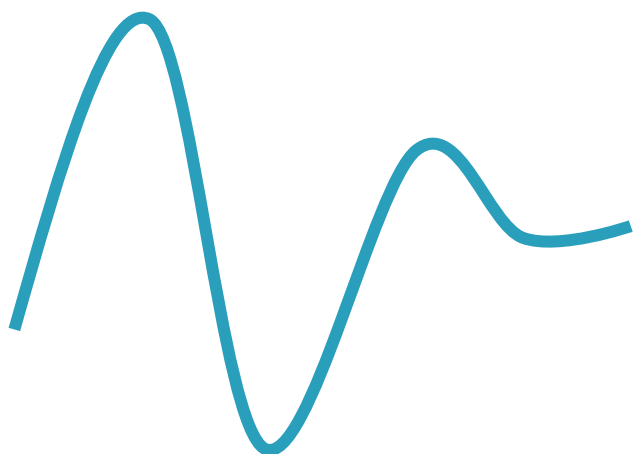
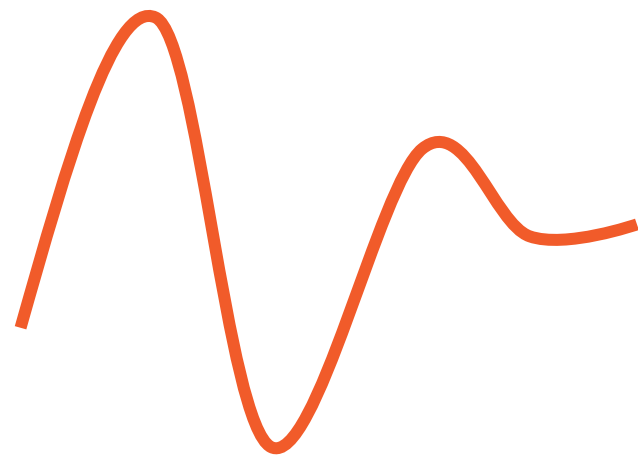
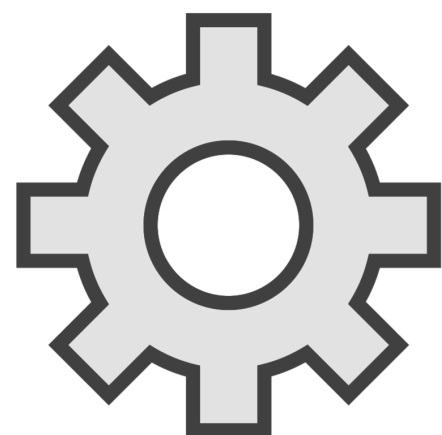


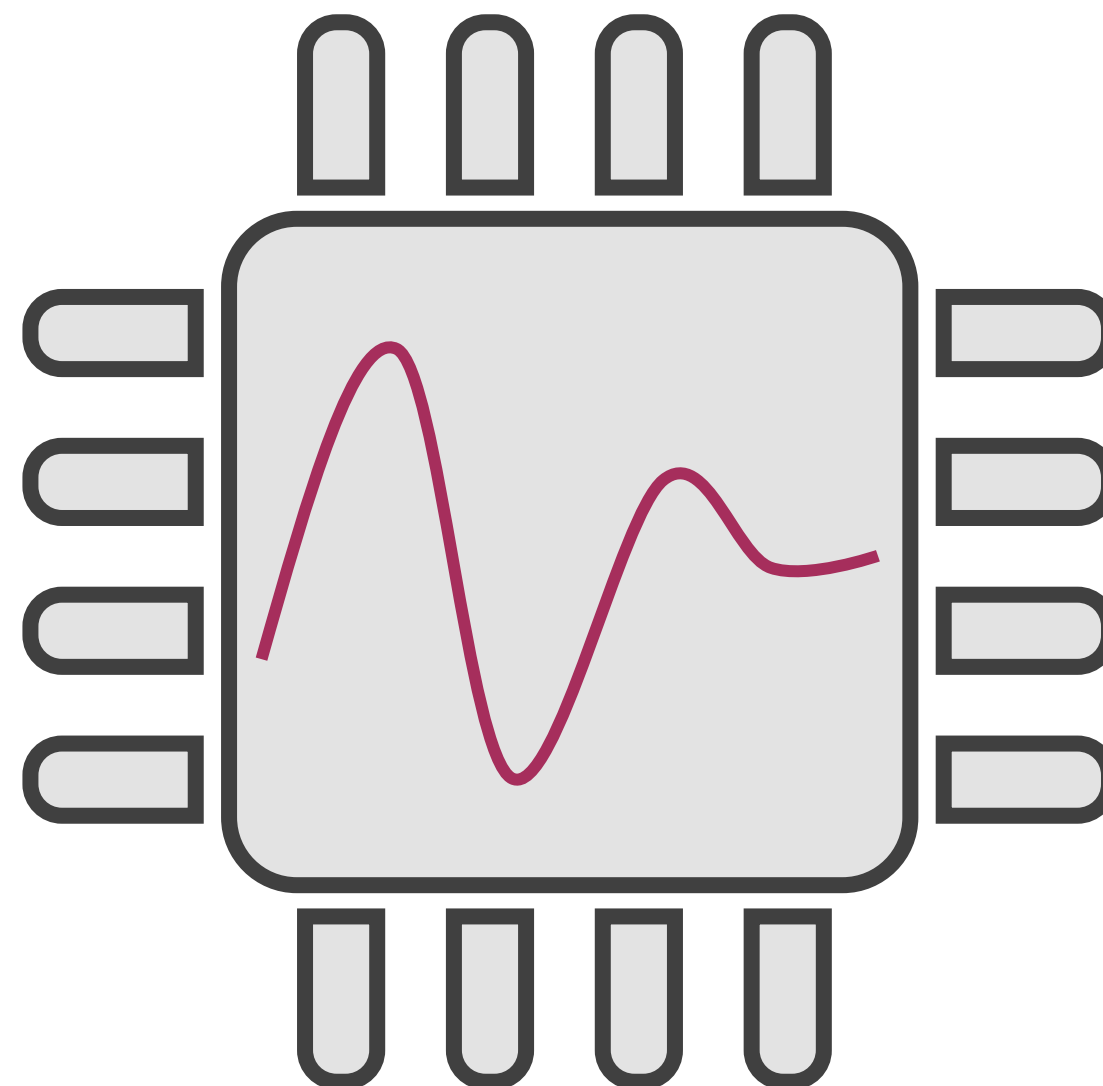
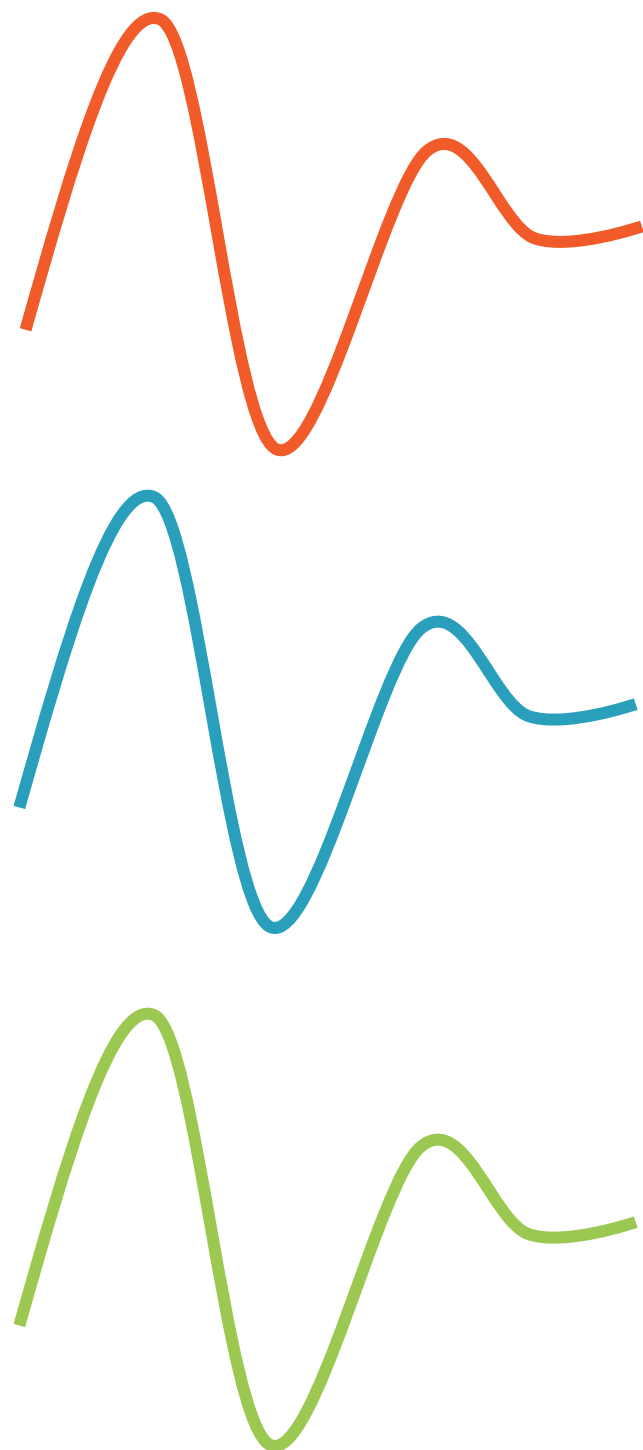
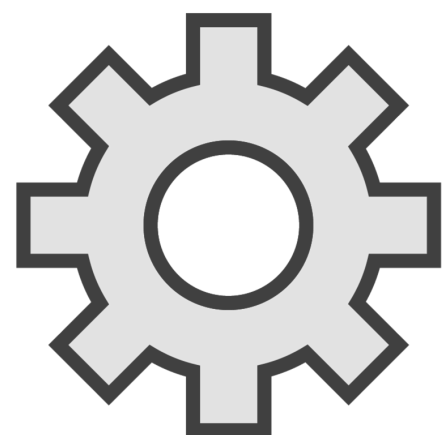






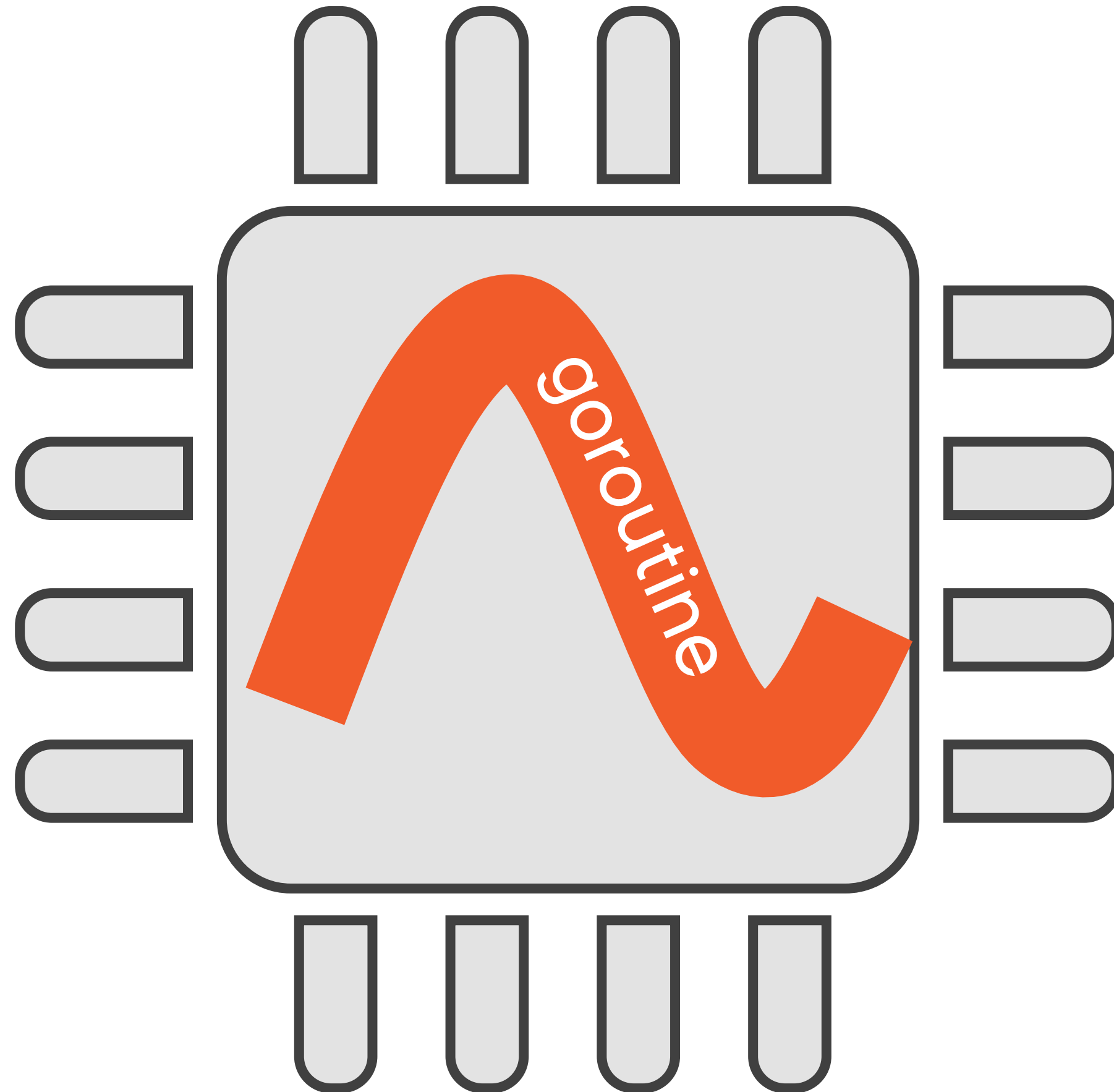


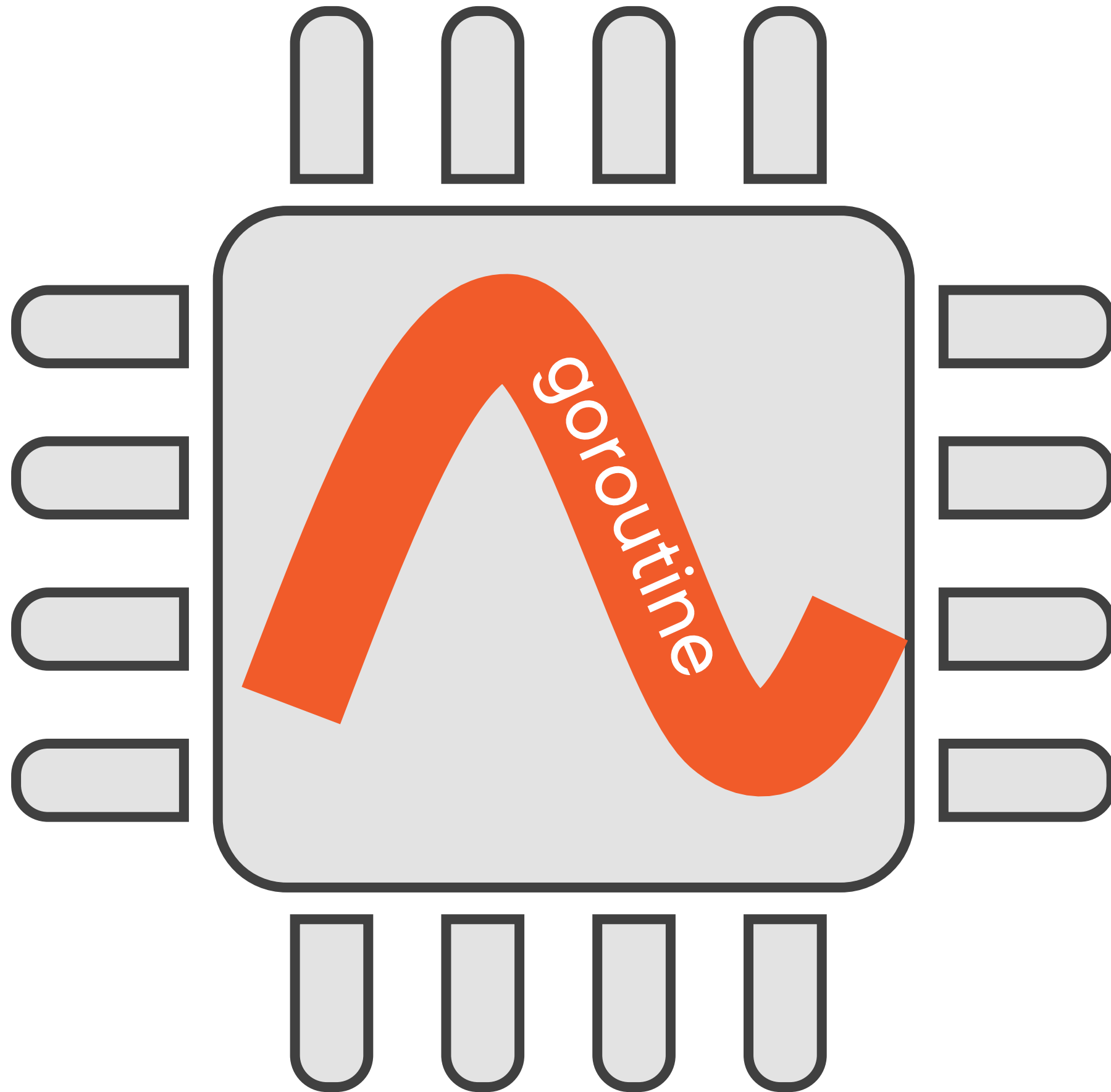




Go's Concurrency Model







Scheduled by Go runtime

Lighter weight than OS threads

Grown & shrink

Go manages goroutines

Fewer context switches

Use less threads

Fast startup times

Communicate via channels



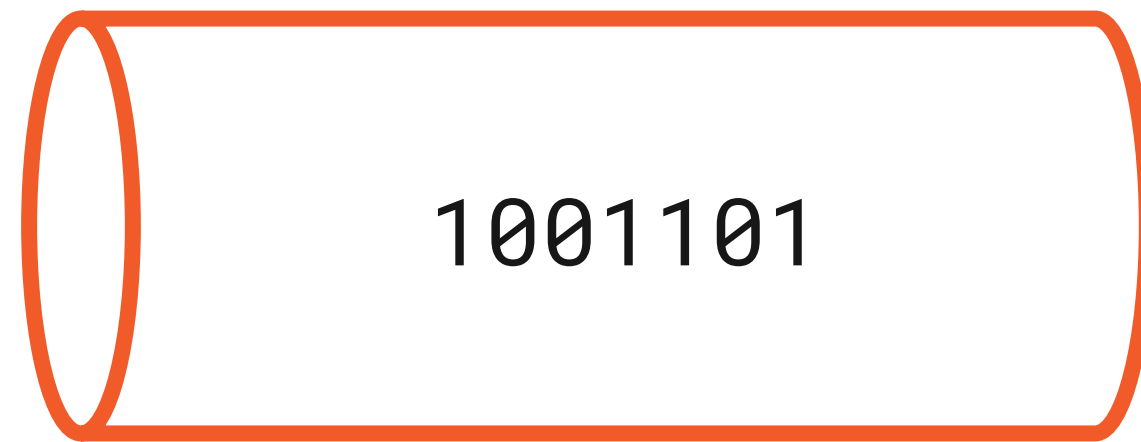
Go's concurrency model:

- Actor
- Communicating Sequential processes (CSP)





goroutine-1



channel

goroutine-2



Up Next:
Hands-on



Hands-on



Channels



Channels

Unbuffered

Synchronous behavior

Buffered

Asynchronous behavior



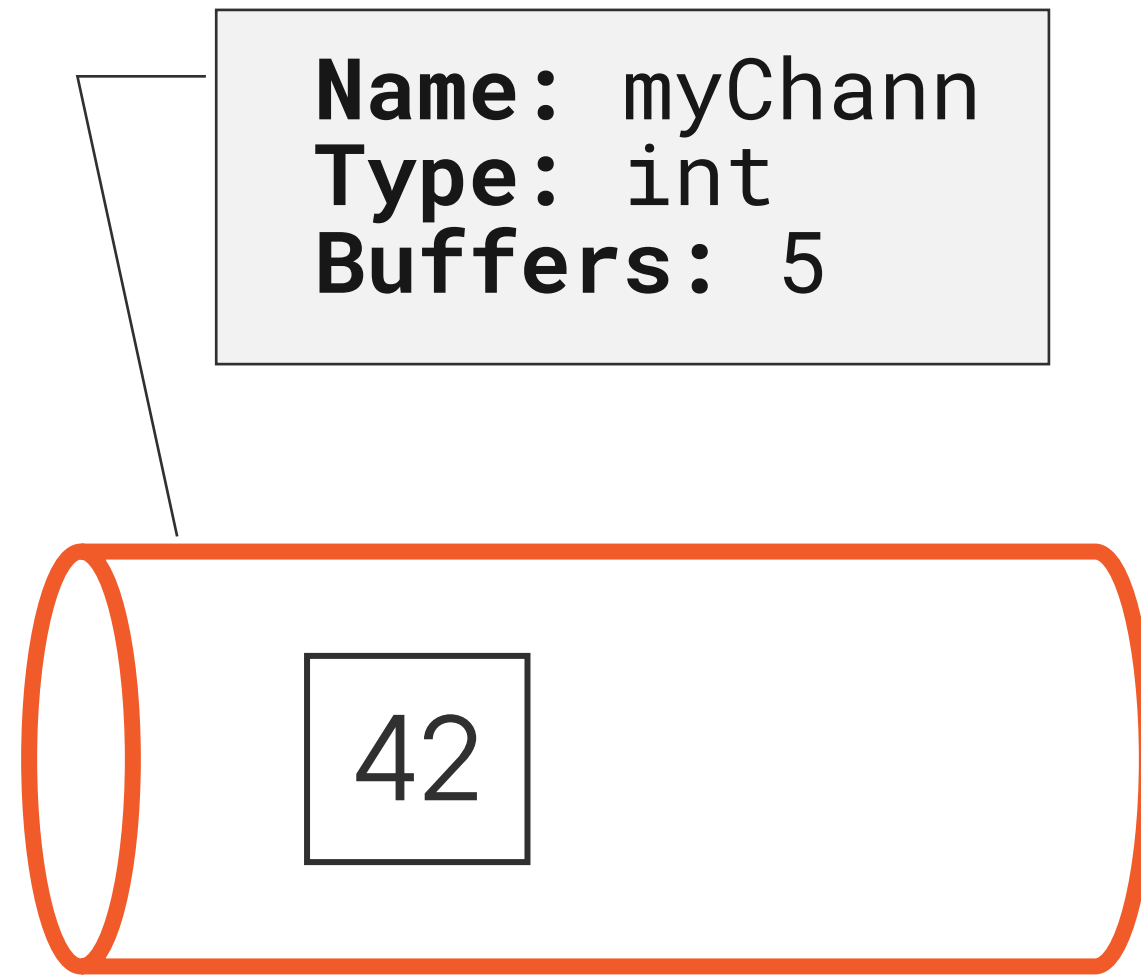
```
myChann := make(chan int)
```



```
myChann := make(chan int, 5)
```



goroutine



```
myChann := make(chan int, 5)
```



Recap



Concurrency

Dealing with lots of things, but only actually doing one thing at a time

“go” keyword makes functions goroutines

Goroutines use channels to share data



Up Next:
What Next

