GO on the toilet

episode #9

Golang wants you to be safe

One of the most powerful features of go is it's concurrency model built around goroutines and channels. **Goroutine** is a lightweight thread managed by the Go runtime. **Channel** enables unidirectional communication between goroutines. If you want to know more about channels and goroutines, stay tuned - in upcoming episodes we will take a closer look at them.

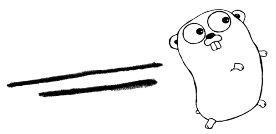
One of the problems with concurrent programming is a **data race**. Data race is a situation where a state of a variable is being changed concurrently, which effects in indefinite state of the variable. As said before, golang wants you to be safe. Consider running your code with **`-race`** flag. With this flag, golang builds a special instrumented binary, which warns you about every encountered data race event.

Let's have a look at an example, where a counter is increased 1000 times. Each write operation happens in a different goroutine.

```
func main() {
      counter := 0
      wg := sync.WaitGroup{}    // Used only to wait for all goroutines to finish
      iterations := 1000
      wg.Add(iterations)
      for i := 0; i < iterations; i++ {
            go func() {
                  counter++     // Concurrent write to the variable
                  wg.Done()
            }()
      }
      wg.Wait()
      fmt.Println(counter)
}
```

The result of running the example (using **`go run -race main.go`**) prints detailed report that states which goroutine, in which line of code causes data race. Another clue that the code doesn't behave in a deterministic fashion is that each execution provides a different result. It's worth to note that the production code we write is slightly more complex and spotting data races may be quite a challenge. It is a good practice to run your tests with **`-race`** flag to spot early some of non-obvious errors on CI pipeline.

In the next episode we will take a look at one of golangs proverb *"Do not communicate by sharing memory; instead, share memory by communicating.* Unfortunately here we've seen communicating by sharing memory, which we will fix next time.



Bathroom magazine with golang trivia, examples and patterns
Inspired by original Google's "Testing on the Toilet"
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