In the Loop

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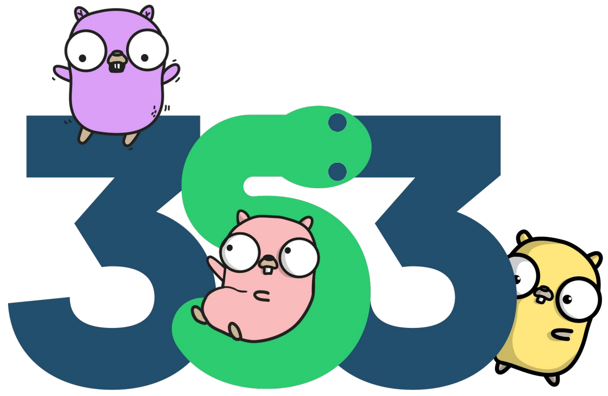

the boring one

```
total := 0
➤ for i := 0; i < 1000; i++ {
    if i%3 == 0 || i%5 == 0 {
        total += i
    }
}
fmt.Println(total)
```

euler_1.go

two variables

```
func isPalindrome(s string) bool {
➤       for i, j := 0, len(s)-1; i < j; i, j = i+1, j-1 {
                if s[i] != s[j] {
                        return false
                }
        }
        return true
}
```

pali.go

while

```
total, a, b := 0, 1, 1
➤ for a <= 4_000_000 {
    if a%2 == 0 {
        total += a
    }
    a, b = b, a+b
}
fmt.Println(total)
```

euler_2.go

forever

```go
func handler(p Provider) {
➤   for {
        msg := p.Next()
        if msg == nil {
            break
        }
        fmt.Printf("%+v\n", msg)
    }
}
```

handler.go

range ∴ slice

```
cart := []string{"bread", "butter", "beer"}
// indices
➤ for i := range cart {
     fmt.Println(i)
}
// index + value
➤ for i, v := range cart {
     fmt.Println(i, v)
}
// values
➤ for _, v := range cart {
     fmt.Println(v)
}
```

slice.go

range ∴ value semantics

```
  var players = []struct {
      name   string
      points int
  }{
      {"Rick", 1_000_000},
      {"Morty", 13},
  }
➤ for _, player := range players {
      player.points += 353
  }
  fmt.Printf("%v\n", players)
  // [{Rick 1000000} {Morty 13}]
```

scores.go

range ∴ pointer(ish) semantics

```
var players = []struct {
        name   string
        points int
    }{
        {"Rick", 1_000_000},
        {"Morty", 13},
    }
➤    for i := range players {
        players[i].points += 353
    }
    fmt.Printf("%v\n", players)
// [{Rick 1000353} {Morty 366}]
```

scores_ref.go

range ∴ map

Same as slices ☺️

range ∴ channel

```go
  ch := make(chan int)
  go func() {
      for i := 0; i < 3; i++ {
          ch <- i
      }
      close(ch)
  }()

➤ for v := range ch {
      fmt.Println(v)
  }
```

chan.go

range ∴ nothing

```
// fan out
ch := make(chan Result)
for _, url := range urls {
    url := url
    go func() {
        ch <- Result{url, checkURL(url)}
    }()
}
// collect
 for range urls {
    r := <-ch
    fmt.Printf("%s: %v\n", r.URL, r.Err)
}
```

urls.go

closure

```
    // fan out
    ch := make(chan Result)
    for _, url := range urls {
➤       url := url
        go func() {
            ch <- Result{url, checkURL(url)}
        }()
    }
```

See redefining for loop variable semantics by Russ Cox.

urls.go

nested

```
found := false
for r := range mat {
    for c := range mat[0] {
        if v := mat[r][c]; v < 0 {
            found = true
            fmt.Println("found", v)
➤           break
        }
    }
}
fmt.Println("negatives:", found)
```

nested.go

nested ∴ fix

```go
    found := false
loop:
    for r := range mat {
        for c := range mat[0] {
            if v := mat[r][c]; v < 0 {
                found = true
                fmt.Println("found", v)
➤                break loop
            }
        }
    }
    fmt.Println("negatives:", found)
```

nested_label.go

goto

I COULD RESTRUCTURE THE PROGRAM'S FLOW
OR USE ONE LITTLE 'GOTO' INSTEAD.
EH, SCREW GOOD PRACTICE. HOW BAD CAN IT BE?
goto main_sub3;
COMPILE

https://xkcd.com/292/

standard library

```
$ ag --vimgrep -s --go 'goto\s+' ~/sdk/go1.19.5/src | \
    grep -v testdata  | \
    grep -v _test.go | \
    wc -l
610
```

nested ∴ goto

```go
    found := false
    for r := range mat {
        for c := range mat[0] {
            if v := mat[r][c]; v < 0 {
                found = true
                fmt.Println("found", v)
                goto end
            }
        }
    }
end:
    fmt.Println("has even:", found)
```

nested_goto.go

iteration ∴ scanner

```
    lnum := 0
    s := bufio.NewScanner(r)
➤   for s.Scan() {
        lnum++
        if strings.Contains(s.Text(), term) {
            fmt.Printf("%d: %s\n", lnum, s.Text())
        }
    }
    if err := s.Err(); err != nil {
        log.Fatalf("error: %s", err)
    }
```

See discussion: standard iterator interface by Ian Lance Taylor

fgrep.go

Thank You

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