Data Structures in Go

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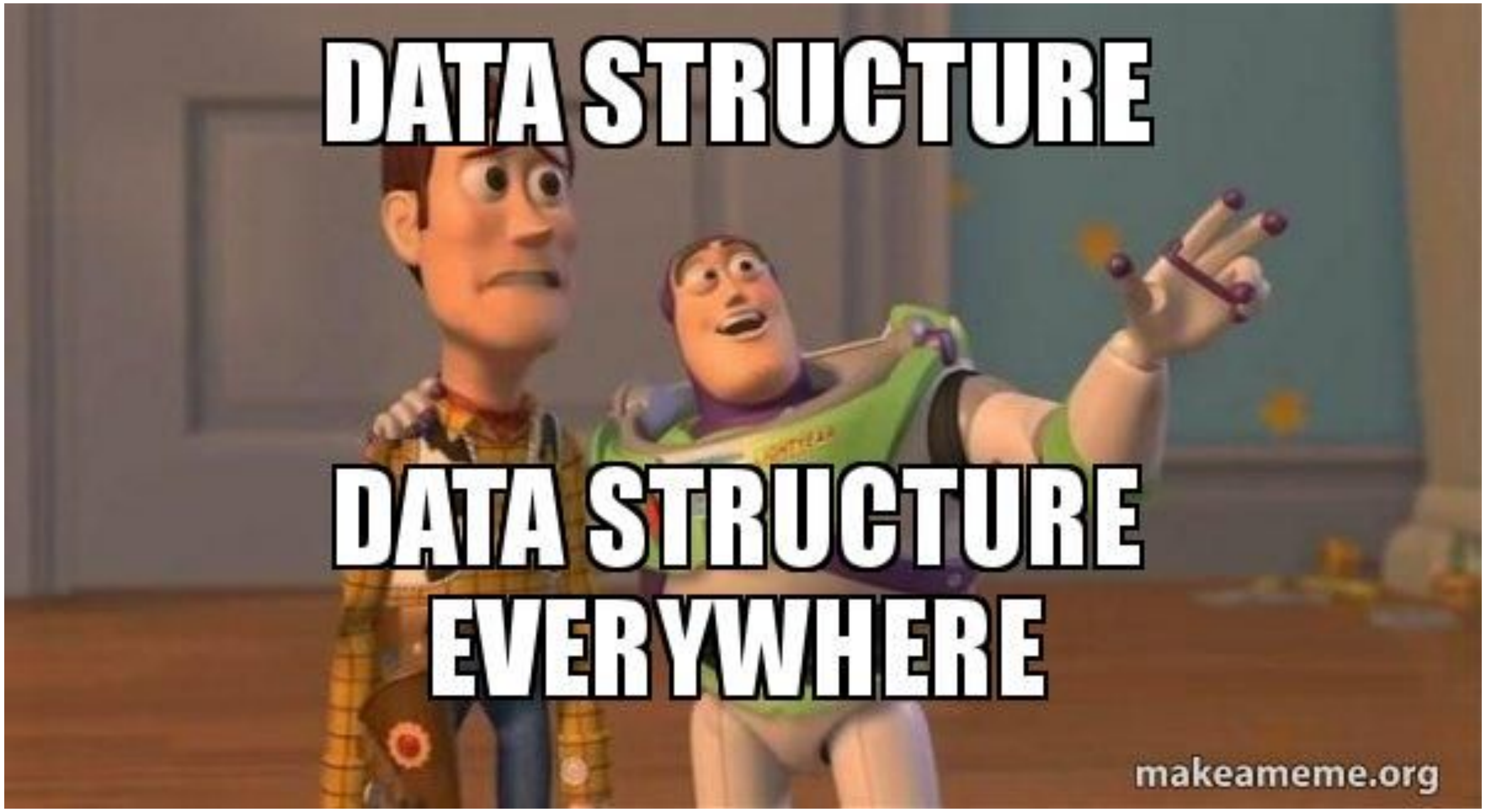
Data Structures



Maps

Google My Maps
Wilhelmshaven-Nord
Aurich
Varel
Westerstede
Leer (Ostfriesland)
Papenburg
Brake
Oldenbg-Kreyenbrück
Bremen

Maps

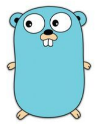
- One of the most useful data structures in computer science is the hash table.

```
map[KeyType]ValueType
```

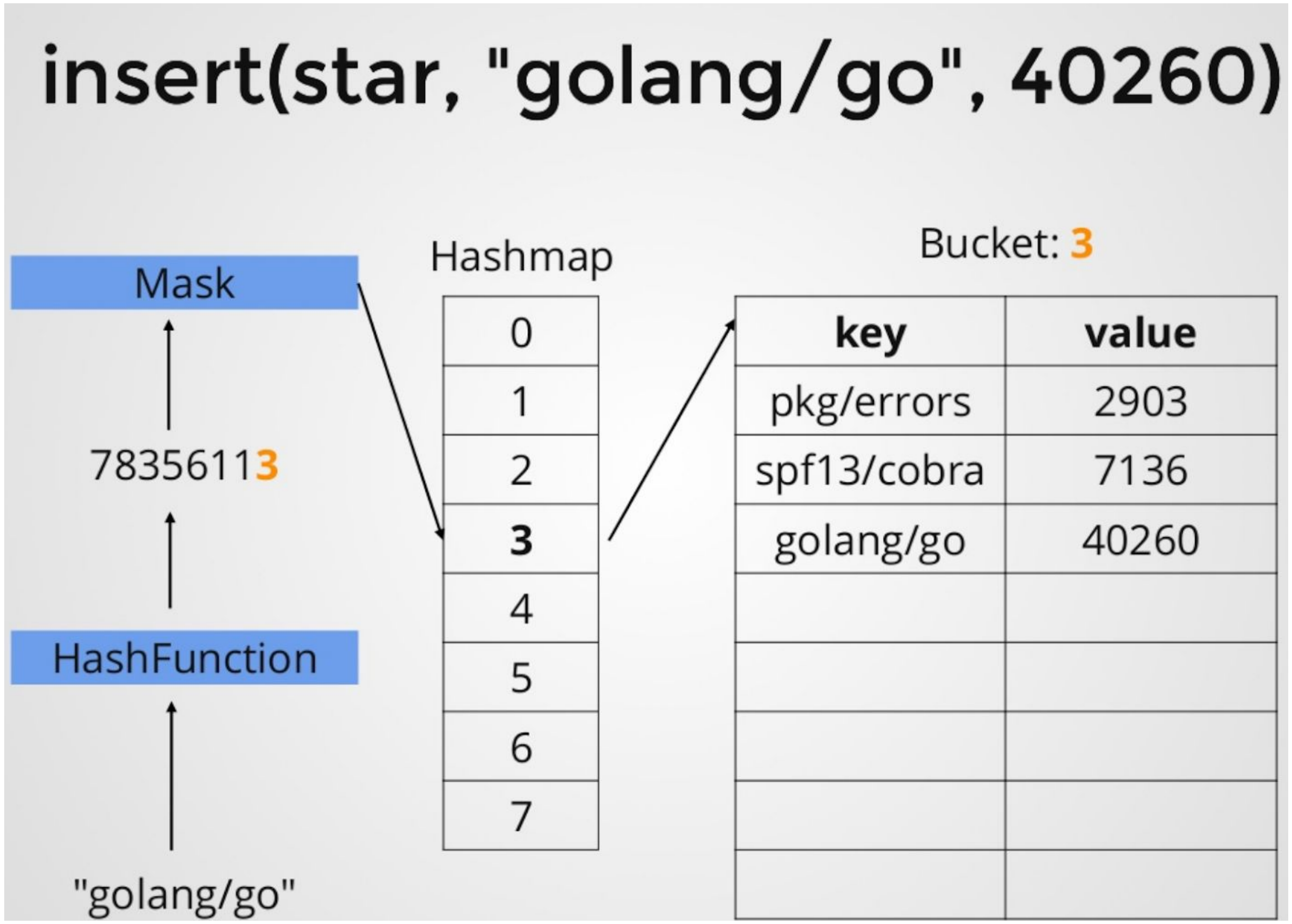
```
-  KeyType : Comparable Type(No Slices,Map,Functions)
-  ValueType: Any Type
```

- Define a Map

```
var m map[string]int
```



Maps



key	value
pkg/errors	2903
spf13/cobra	7136
golang/go	40260

Maps

- Map types are reference types, like pointers or slices

```
m = make(map[string]int)
```

- The make function allocates and initializes a hash-map data structure and returns a map value that points to it.

Working With Maps

• Add item to map	`m["route"] = 66`
• Access item	`i := m["route"]`
• Access Not-Exist Item	`j := m["root"] // j == 0`
• Length of a Map	`n := len(m)`
• Delete an Item	`delete(m, "route")`

Working With Maps

- Check and Get Value

```
i, ok := m["route"]
```

- Only Check

```
_, ok := m["route"]
```

- Iterate Over Content

```
for key, value := range m {
    fmt.Println("Key:", key, "Value:", value)
}
```

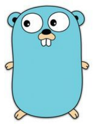
Initialize

- Multiple Initialize

```
commits := map[string]int{
    "rsc": 3711,
    "r":   2138,
    "gri": 1908,
    "adg": 912,
}
```

- Empty Initialize

```
m = map[string]int{}
```



Slice and Array

- Array: Store fixed number of elements

```
var myArray [size]type
var integerArray [5]int

a := [5]int{10,20,30,40,50}
b := [4]string{"first", "second", "third", "fourth"}
```

Slice

- Array size is limited

- Unlike an array, no need to specify the length of the slice when defining it.

```
var s []int
s := []int{1,2,3,4,5}
```

- Because slice is pointer type, weh should make it first:

```
s := make([]int, n)
```

Slice

```
s = []int{10,20,30,40}
```

- Add

  ```
  s = append(s, 50)
  s = append(s, 60, 70)
  ```

- Delete

  ```
  a = append(a[:i], a[i+1]...)
  ```

- Update

  ```
  a[i] = a[len(a)-1]
  ```

- Read

  ```
  a = a[j:n] //j is included, but n is not
  ```

Loop Through Slice

- For

```go
for key, value := range s {
    fmt.Println(key, value)
}
```

- Range

```go
for i := 0; i < len(s); i++ {
    fmt.Println(s[i]) //get the value at index "i"
}
```

Struct

- Go struct is a collection of named fields/properties.

- A struct can have the same or different types of fields

```go
type person struct {
    firstName string
    lastName  string
    age       int
}
```

Structs

- Struct with Slice Field

```
type animal struct {
    name string
    characteristics []string
}
```