Package

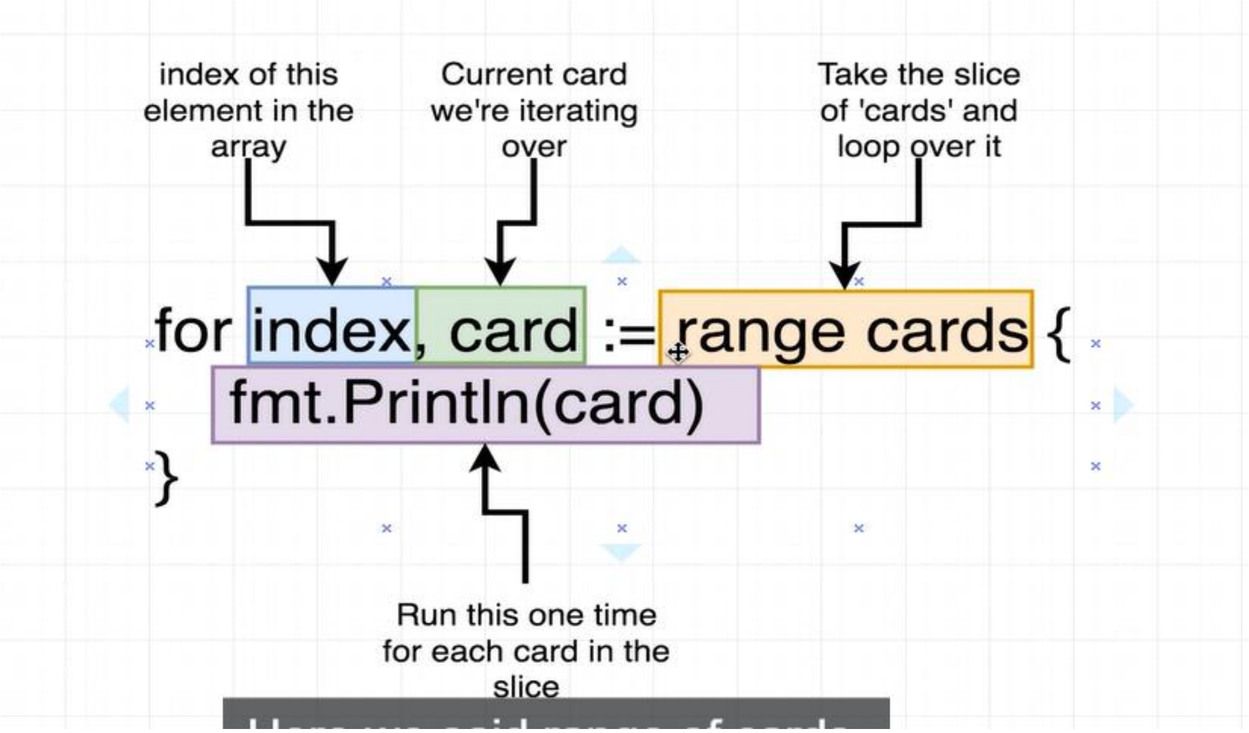
Package is collection of common source code files.

Package == project==workspace

“%+v”	Print struct value with its corresponding field .

For index, value := range arr {

}



```
for index, card := range cards {
    fmt.Println(card)
}
```

index of this element in the array
Current card we're iterating over
Take the slice of 'cards' and loop over it
Run this one time for each card in the slice

```
var arr [5]int = [5]int{1, 2, 3, 4, 5}
    for i, v := range arr {
        //fmt.Printf("\nindex=%d", i, "value=%d", v)
        fmt.Printf("\nindex=%d, value=%d", i, v)
    }


ar := [5]int{10, 20, 30, 40, 50}
    for i, v := range ar {
        //fmt.Printf("\nindex=%d", i, "value=%d", v)
        fmt.Printf("\nindex=%d, value=%d", i, v)
    }
```

No.	**Array**	**Slice**
Size	Fixed.	Dynamic size can grow shrink like vector.Slices are built on top of arrays and provide a more flexible way to work with collections of data.
Declaration Syntax	var arr `[5]`int	var slice `[]` int, OR `slice := make([]int, 0, 5)`
Passing Argument	Array pass by value	Slice by reference.
Usage	need a fixed-size collection of elements	more commonly used in Go because of their flexibility and dynamic nature. Support more operation like slicing ,appending

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Struct

Import (

“fmt”

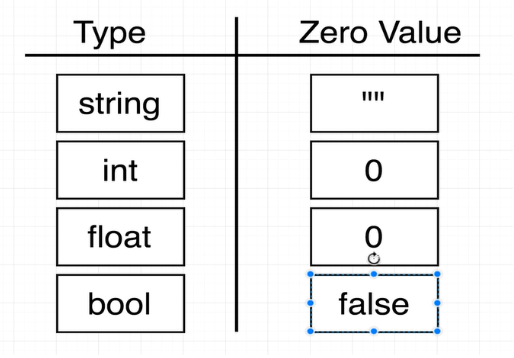
“unsafe”)

Type Emp struct {
Id int
Name string
}

Func main() {
E:= Emp {id :1, Name:”Sagar”)

```
tempid := unsafe.Sizeof(e)

fmt.Printf("Emp id=%d, Name=%s", e.id, e.name)

}
```

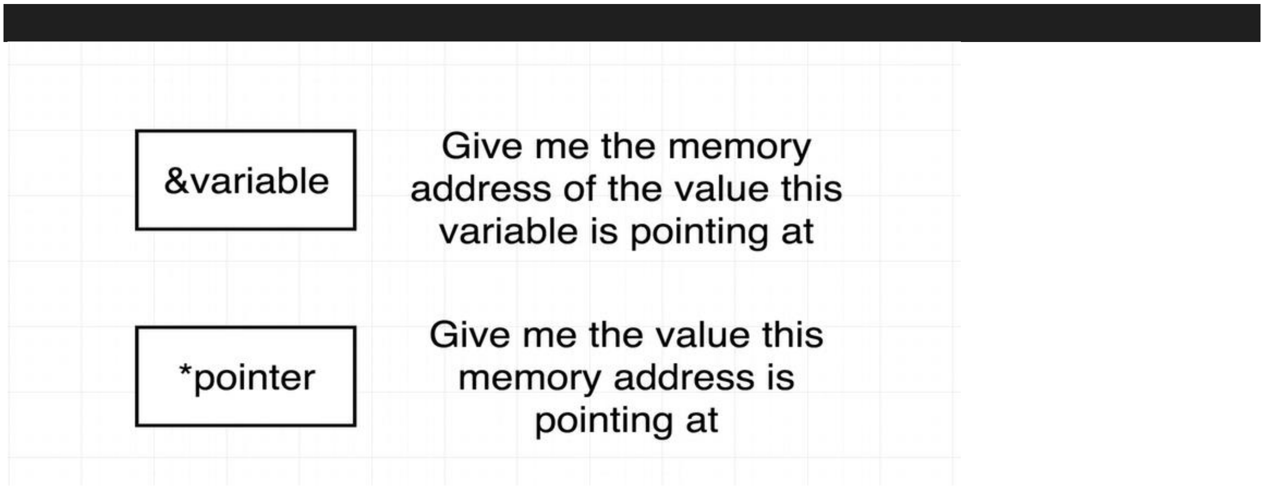
Note: - When we just declared struct NOT initialized then by default value is zero .



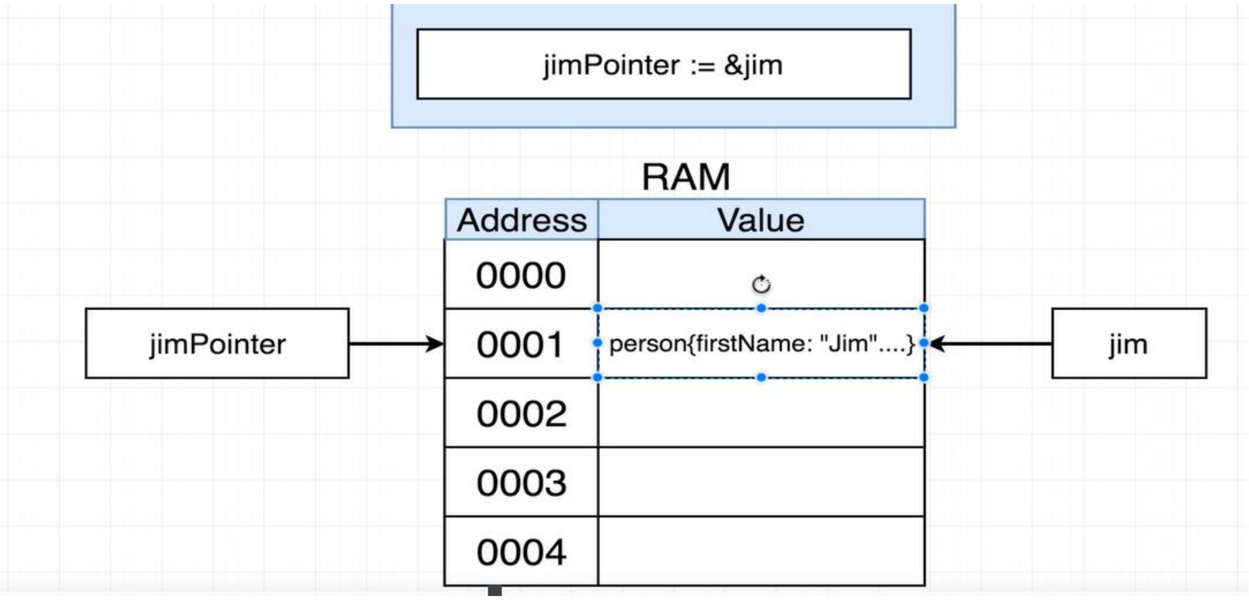
Type	Zero Value
string	""
int	0
float	0
bool	false

Struct using pointer, So its like reference pass to function.

```
type Emp struct {
    id   int
    name string
}

/*func (e Emp) update() {
    e.id = 201
    e.name = "Sagar"
}*/

func (e *Emp) update() {
    (*e).id = 201
    (*e).name = "Sam"
}

func main() {

    e := Emp{id: 101, name: "Sagar"}
    eptr := &e
    fmt.Printf("\n Emp value id=%d, name=%s ", e.id, e.name)
    //e.update()
    fmt.Printf("\nAfter update Emp value id=%d, name=%s ", e.id, e.name)
    eptr.update()
    fmt.Printf("\nAfter pointer update Emp value id=%d, name=%s ", e.id, e.name)
}
```



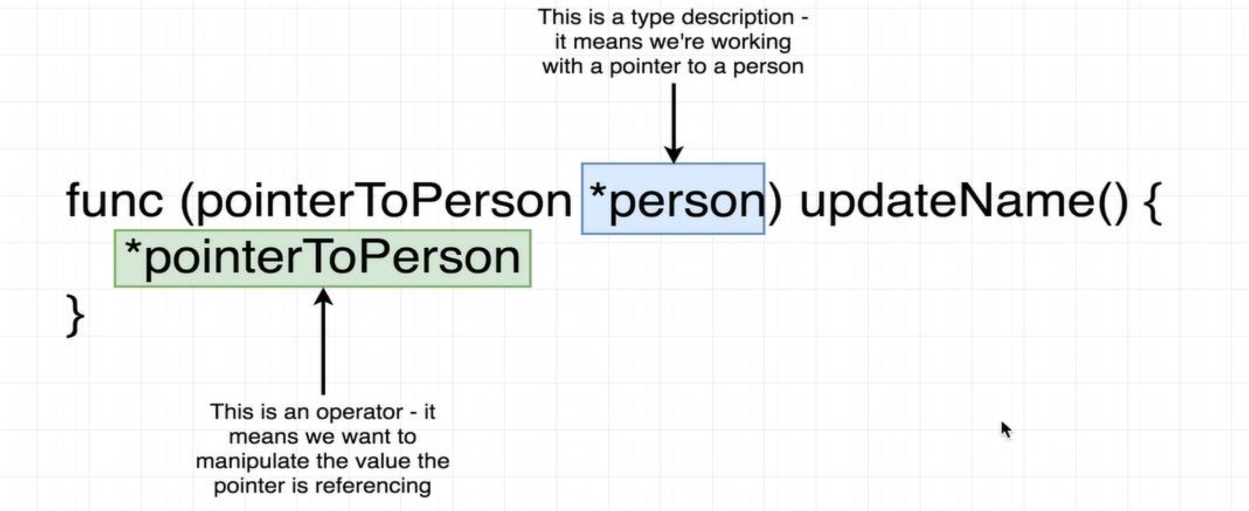
&variable	Give me the memory address of the value this variable is pointing at
*pointer	Give me the value this memory address is pointing at



```
jimPointer := &jim
```

RAM

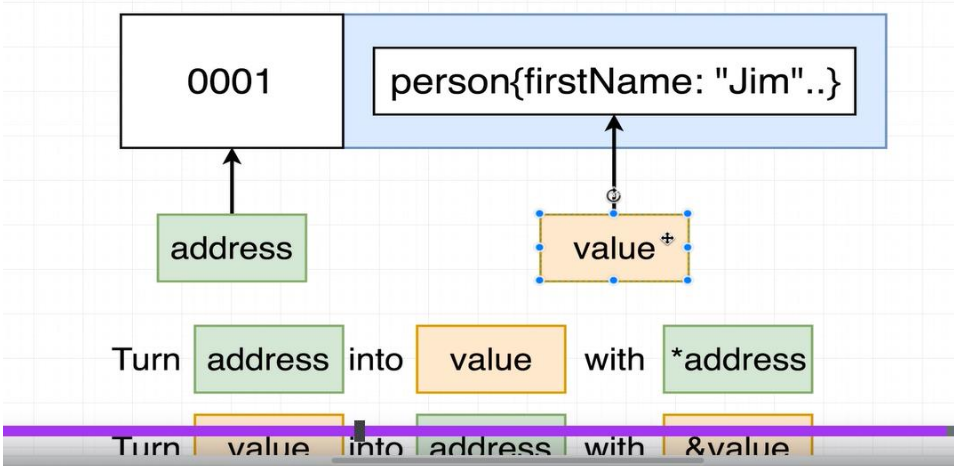
Address	Value
0000	
0001	person{firstName: "Jim"....}
0002	
0003	
0004	



```
func (pointerToPerson *person) updateName() {
    *pointerToPerson
}
```

This is a type description - it means we're working with a pointer to a person

This is an operator - it means we want to manipulate the value the pointer is referencing

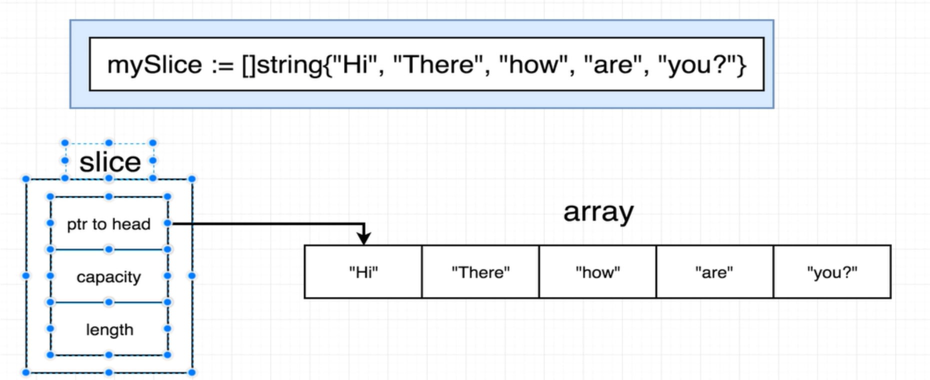

0001
person{firstName: "Jim"..}
address
value
Turn address into value with *address
Turn value into address with &value

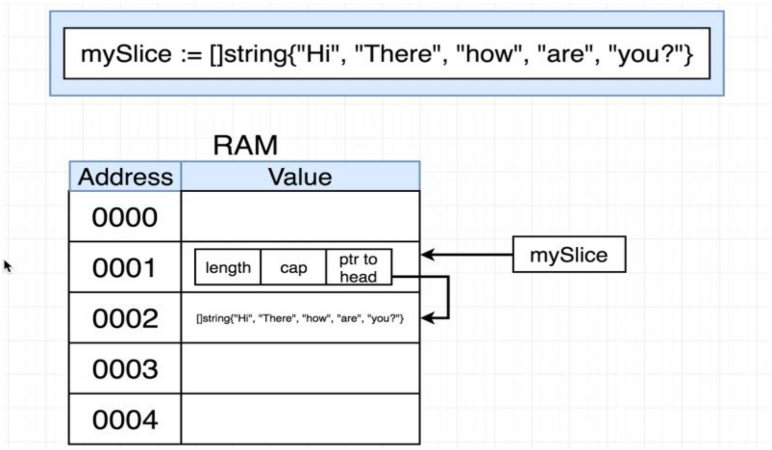
IMP : Structure can pass as value OR it just pass with/Without pointer but receiver you have used pointer at receiver then it become pointer.

e :=Emp{id:111,name:”Sagar”} //initialize e object
e.update()
func (epointer *emp)update() {}
	e :=Emp{id:111,name:”Sagar”} //initialize e object
	eptr = &e
	eptr.update()
	func (epointer *emp)update() {}

Above both type work	

Difference between slice and struct



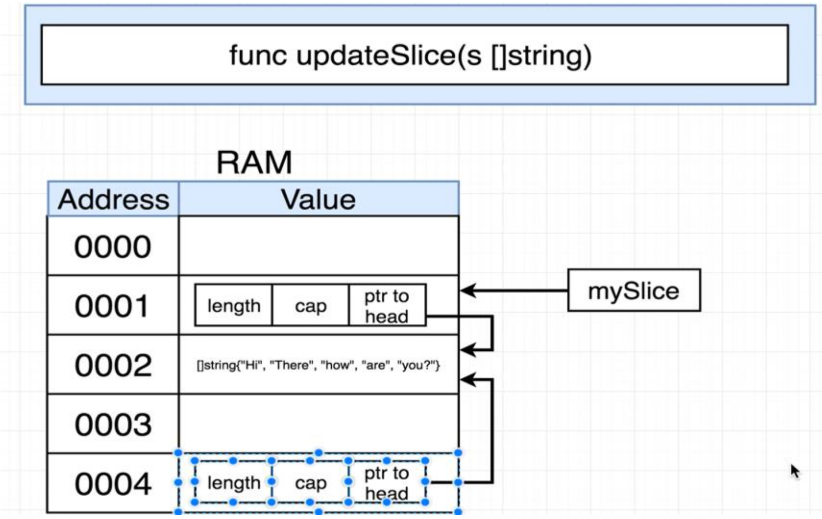


```
mySlice := []string{"Hi", "There", "how", "are", "you?"}
```

RAM

Address	Value
0000	
0001	length | cap | ptr to head
0002	[]string{"Hi", "There", "how", "are", "you?"}
0003	
0004	

Note: Go is pass by value language

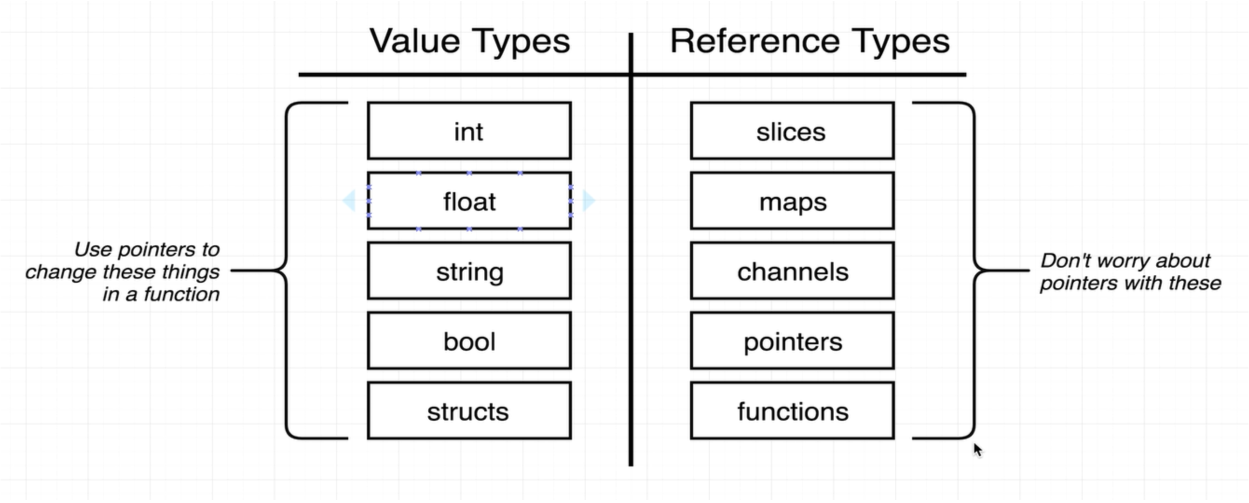


```
func updateSlice(s []string)
```

RAM

Address	Value
0000	
0001	length | cap | ptr to head
0002	[]string{"Hi", "There", "how", "are", "you?"}
0003	
0004	length | cap | ptr to head

Here When pass slice as argument then slice will copy its value as shown above.



Value Types	Reference Types
int	slices
float	maps
string	channels
bool	pointers
structs	functions

Use pointers to change these things in a function
Don't worry about pointers with these

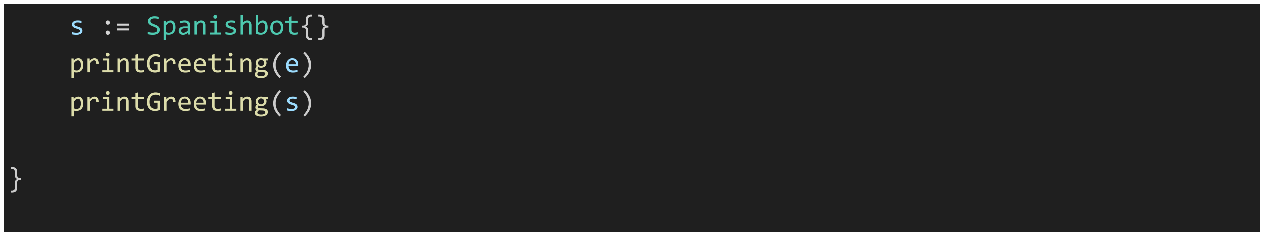
MAP

Mapname := map[key]value
myMap :=map[int]string
mymap :=make(map[int]string)
Maps are **unordered** collections, meaning that the order of key-value pairs is not guaranteed.

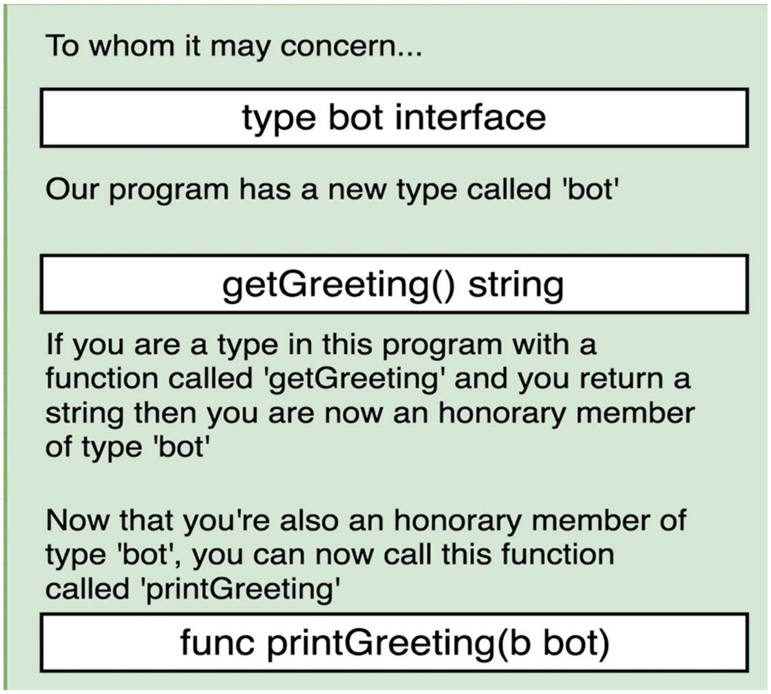
Interface

you can’t overload same function , that why interface is introduce.

```
package main

import (
    "fmt"
)

type Bot interface {
    getGreeting() string
}

type Englishbot struct {
}

func (Englishbot) getGreeting() string { // This is member method of that struct
    return "English Hello"              // So same name is allowed .
}

type Spanishbot struct {
}

func (Spanishbot) getGreeting() string {// This is member method of that struct
    return "Spanish Hola"      // So same name is allowed .
}

func printGreeting(b Bot) {
    fmt.Println(b.getGreeting())
}

func main() {
    fmt.Printf("")

    e := Englishbot{}
```



```
    s := Spanishbot{}
    printGreeting(e)
    printGreeting(s)

}
```



To whom it may concern...

type bot interface

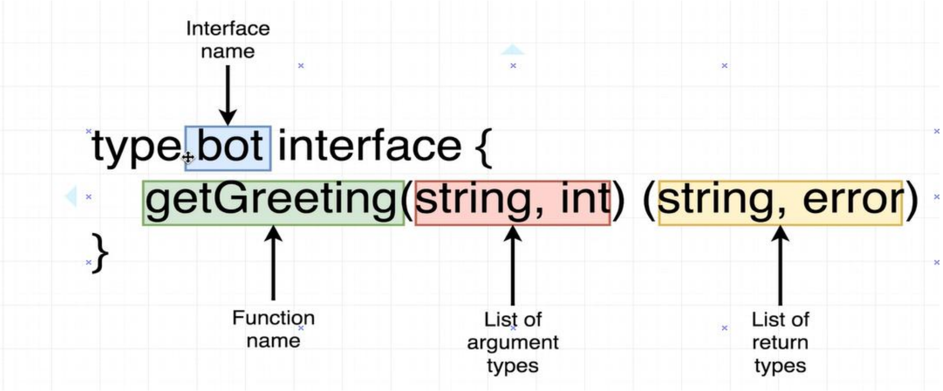
Our program has a new type called 'bot'

getGreeting() string

If you are a type in this program with a function called 'getGreeting' and you return a string then you are now an honorary member of type 'bot'

Now that you're also an honorary member of type 'bot', you can now call this function called 'printGreeting'

func printGreeting(b bot)



```
type bot interface {
    getGreeting(string, int) (string, error)
}
```

Interface automatically link with function . Q. How?