Cheatography

Golang Cheat Sheet

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Basic Syntax

```
package main
import " fmt "
func main() {
        fmt.Pr int ln( " Hello
Go")
}
```

Packages

- package declaration at top of every source file
- executables are in package main
- convention: package name == last name of import path (import path math/rand => package rand)
- upper case identifier: exported (visible from other packages)
- Lower case identifier: private (not visible from other packages)

Operators

Arithmetic

```
+ addition
- subtra ction
* multip lic ation
/ quotient
% remainder
& bitwise and
| bitwise or
^ bitwise xor
&^ bit clear (and not)
<< left shift
>> right shift
```

Comparison

```
== equal
!= not equal
< less than
```

Operators (cont)

```
<= less than or equal
> greater than
>= greater than or equal
```

Logical

```
&& logical and
|| logical or
! logical not
```

Other

```
& address of / create pointer
* derefe rence pointer
<- send / receive operator
```

Functions

```
// a simple function
func functi onN ame() {}
// function with parameters
func functi onN ame (param1
string, param2 int) {}
// multiple parameters of the
same type
func functi onN ame (pa ram1,
param2 int) {}
// return type declar ation
func functi onN ame() int {
        return 42
}
// return multiple
func return Multi() (int,
string) {
        return 42, " foo bar "
}
var x, str = return Multi()
// Return multiple named results
simply by return
func return Mul ti2() (n int, s
string) {
       n = 42
       s = " foo bar "
       // n and s will be
returned
        return
}
var x, str = return Mul ti2()
```

Functions As Values And Closures

```
func main() {
       // assign a function to a
name
       add := func(a, b int) int
{
                return a + b
       }
       // use the name to call
the function
        fmt.Pr int ln( add(3,
4))
}
// Closures, lexically scoped:
Functions can access values that
were
// in scope when defining the
function
func scope() func() int{
        out er_var := 2
       foo := func() int {
return outer_var}
        return foo
}
func anothe r_s cope() func()
int{
       // won't compile because
outer_var and foo not defined in
this scope
        out er_var = 444
        return foo
}
// Closures: don't mutate outer
vars, instead redefine them!
func outer() (func() int, int) {
        out er_var := 2
        inner := func() int {
```

Functions (cont)

Functions (cont)

```
                out er_var += 99
// attempt to mutate outer_var
from outer scope
                return outer_var
// => 101 (but outer_var is a
newly redefined
                                -
                 // variable
visible only inside inner)
       }
        return inner, outer_var
// => 101, 2 (outer_var is still
2, not mutated by foo!)
}
```

Variadic Functions

```
func main() {
        fmt.Pr int ln( add er(1,
2, 3)) // 6
        fmt.Pr int ln( add er(9,
9)) // 18
       nums := []int{10, 20, 30}
        fmt.Pr int ln( add er( -
num s...)) // 60
}
// By using ... before the type
name of the last parameter you
can indicate that it takes zero
or more of those parame ters.
// The function is invoked like
any other function except we can
pass as many arguments as we
want.
func adder(args ...int) int {
        total := 0
       for _, v := range args {
// Iterates over the arguments
whatever the number.
                total += v
       }
        return total
}
```

Declarations

```
var foo int // declaration
without initial.
var foo int = 42 // declar ation
with initial
var foo, bar int = 42, 1302 //
declare and init
var foo = 42 // type omitted,
will be inferred
foo := 42 // shorthand
const constant = "This is a
consta nt"
```

Type Conversions

```
var i int = 42
var f float64 = float64(i)
var u uint = uint(f)
// altern ative syntax
i := 42
f := float64(i)
u := uint(f)
```

Arrays, Slices, Ranges

Arrays

```
var a [10]int
// declare an int array with
length 10. Array length is part
of the type!
a[3] = 42 // set elements
i := a[3] // read elements
// declare and initialize
var a = [2]int{1, 2}
a := [2]int{1, 2} //shor thand
a := [...]i nt{1, 2} // elipsis
-> Compiler figures out array
length
```

Slices

```
var a []int // declare a slice -
similar to an array, but length
is unspec ified
```

Arrays, Slices, Ranges (cont)

```
var a = []int {1, 2, 3, 4} //
declare and initialize a slice
(backed by the array given
implic itly)
a := []int{1, 2, 3, 4} //
shorthand
chars := []stri ng{ 0:"a ",
2:"c ", 1: " b"} // ["a", " b",
" c"]
var b = a[lo:hi] // creates a
slice (view of the array) from
index lo to hi-1
var b = a[1:4] // slice from
index 1 to 3
var b = a[:3] // missing low
index implies 0
var b = a[3:] // missing high
index implies len(a)
// create a slice with make
a = make([ ]byte, 5, 5) // first
arg length, second capacity
a = make([ ]byte, 5) // capacity
is optional
// create a slice from an array
x := [3]str ing {"Ла йка ", " -
Бел ка", " Стр елк а"}
s := x[:] // a slice refere -
ncing the storage of x
```

Built-in Types

```
bool
string
int int8 int16 int32 int64
uint uint8 uint16 uint32 uint64
uintptr
byte // alias for uint8
rune // alias for int32 ~= a
character (Unicode code point) -
very Viking
float32 float64
complex64 complex128
```

Control structures

If

```
func main() {
	// Basic one
	if x > 0 {
		return x
	} else {
		return -x
	}
	// You can put one statement before the condition
	if a := b + c; a < 42 {
		return a
	} else {
		return a - 42
	}
	// Type assertion inside if
	var val interf ace{}
	val = " foo "
	if str, ok := val.(s - tring); ok {
		fmt.Pr int - ln(str)
	}
}
```

Loops

```
// There only for, no while, no until
	for i := 1; i < 10; i++ {
	}
	for ; i < 10; { // while - loop
	}
	for i < 10 { // omit semicolons
	}
	for { //omit the condition ~ while (true)
	}
```

Switch

Control structures (cont)

```
	switch operat ing System {
	case " dar win ":
		fmt.Pr int - ln( "Mac OS Hipste r")
		// cases break automa tically
	case " lin ux":
		fmt.Pr int - ln( " Linux Geek")
	def ault:
		// Windows, BSD, ...
		fmt.Pr int - ln( " Oth er")
	}
	// as with for and if, you can have an assignment statement before the switch value
	switch os := runtim - e.GOOS; os {
	case " dar win ": ...
	}
```