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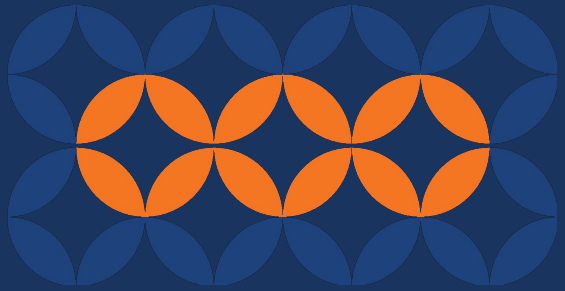

Basic Programming of Golang

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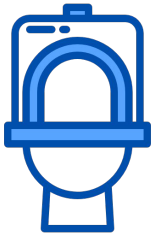
OUR RULES

Silent Mode

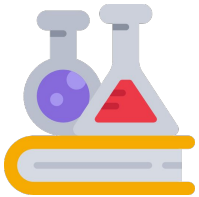
Ask Question



Go Toilet

TIME ALLOCATION

Explanation



Challenge

Review

OUTLINE

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- Introduction Golang
- Fmt Package
- Go Module
- Package "fmt"
- Variables, types, const, zero value
- Arithmetic Operators
- Control Structures (Branching & Looping)

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Let's get started!

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Introduction Golang

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WHAT IS GO?

is a new, general-purpose programming language that makes it easy to build, simple, reliable, and efficient software.

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SYSTEM PROGRAMMING

is a great language for writing lower-level program that provide service to other systems, called system programming

Application Programs

E-commerce
Music Player
Social Media Apps

System Programs

APIs
Game engines
CLI apps

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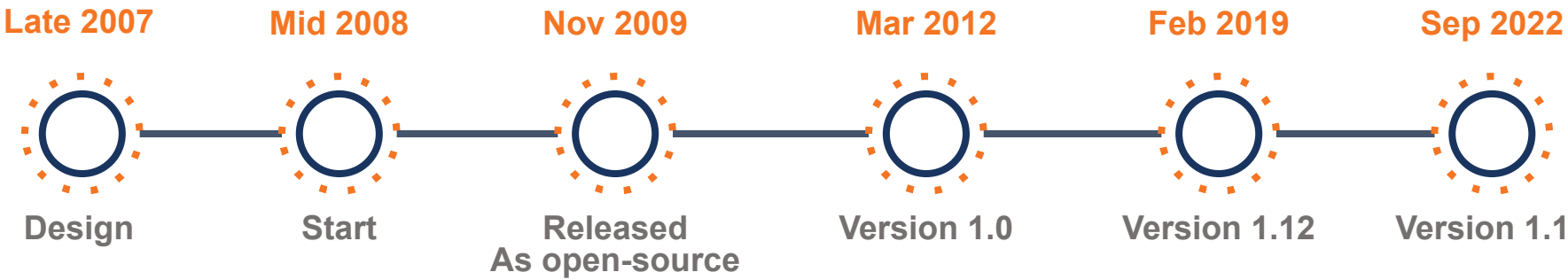
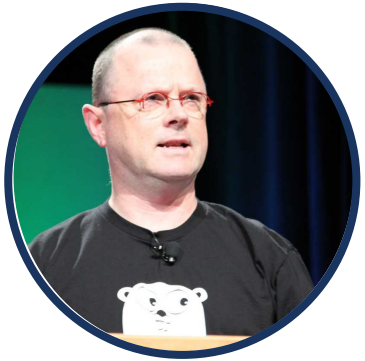
HISTORY OF GOLANG



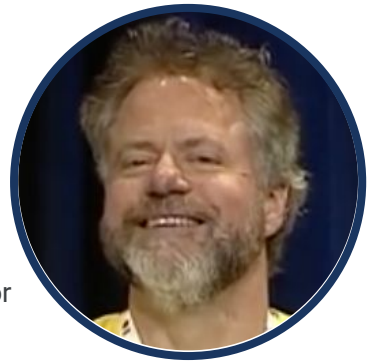
DEVELOPED BY :

Robert Grisemer



Rob Pike

Ken Thompson



Ian Lance Taylor

Russ Cox

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WHY (MUST) GO?

- Fun and Make Programming Fun (simple)
- Combine the best of both.
  - Compiled statically-typed languages (like C) and Dynamic languages (like JavaScript).
  - Go has the lighter feel of a scripting language but is compiled.
- Lightweight syntax.
- Built-in concurrency.
  - Large scale, networked computing, such as Google web search
  - Multi-core hardware
- Open Source.
- Used by Big Company

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COMPANIES USING GO

Uber

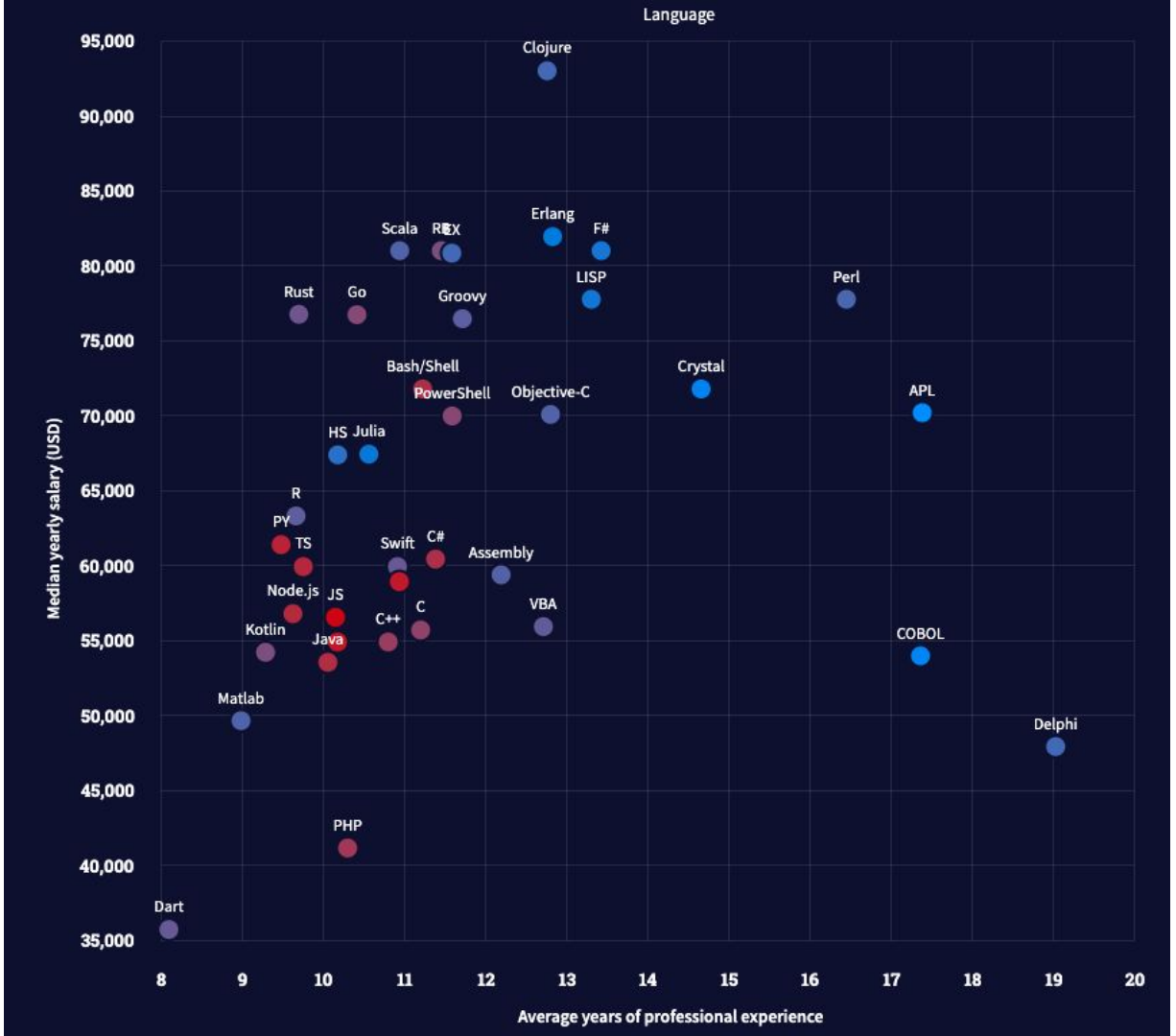
Google

Medium

Grab

tokopedia

Salary By Language



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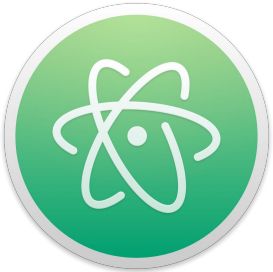
Installation Golang

EDITOR (IDE)

VS Code

GoLand



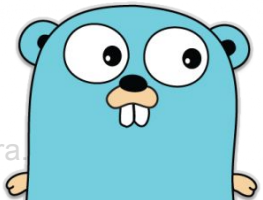
Atom

Vim

INSTALLATION

Via File Archive (Mac, Linux, & Windows)

- Go to https://golang.org/dl/ and download the latest version
- Follow Instruction Installation



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Via Terminal ( )

-terminal

```
$ brew update
$ brew install golang
```

Via Terminal ( )

-terminal

```
curl -O
https://storage.googleapis.com/golang/go1.11.2.linux-amd64.tar.gz

tar -C /usr/local -xzf go$VERSION.$OS-$ARCH.tar.gz
```

GO WORKSPACE

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-terminal

```
workspace/
  bin/
  pkg/
  src/
```

bin: *contains the binary executables.*

pkg: *contains Go package archives.*

src: *contains Go source files.*

LIVE

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GO MODULES

In Go Version > 1.11

What if we create projects **outside** **GOPATH**?

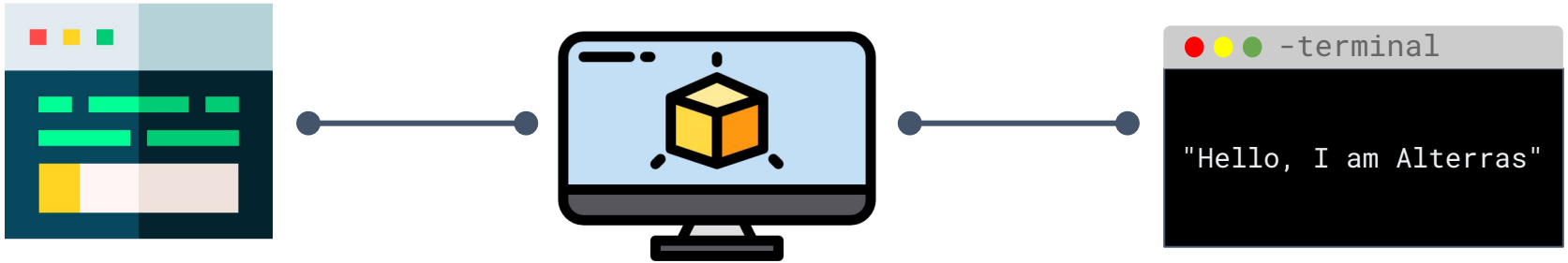
1. Create project outside **GOPATH**.
2. Open Terminal in set directory to this project
3. Run command!

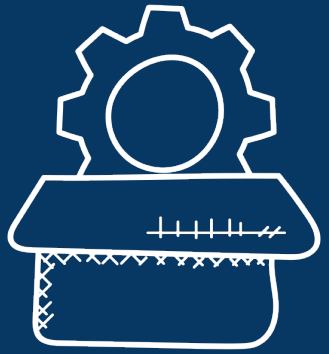
-terminal

```
$ go mod init
```

LIVE

COMPILING PROCESS





COMPILING & RUNNING

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-code editor

```
package main

import "fmt"

func main() {
  fmt.Println("Hello, I am Programmer")
}
```

-code editor

```
$ go build main.go
$ ./main
```

OUTPUT:

```
Hello, I am Programmer
```

LIVE

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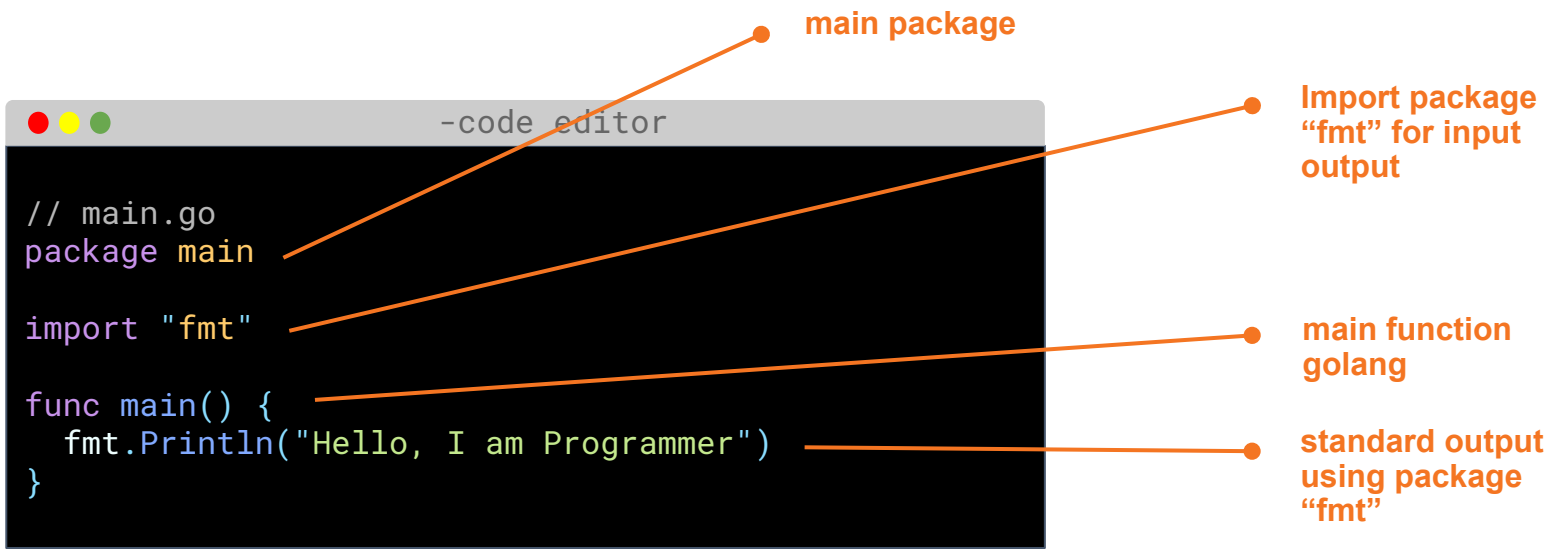
COMMAND GO TERMINAL

Command	Function
go run	Execute the program with extension **.go**
go build	Compile program files.
go install	Like go build and continue the install process.
go test	For testing with suffix **_test.go**
go get	download the Go package.

LIVE

MAIN SYNTAX



LIVE

Package “fmt”

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Output

```
fmt.Printf()
fmt.Println()
fmt.Sprintf()
etc
```

Scanning

```
fmt.Scanln()
```

Format Verb

```
%T,%v,%s,%q,etc.
```

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Variables & Types

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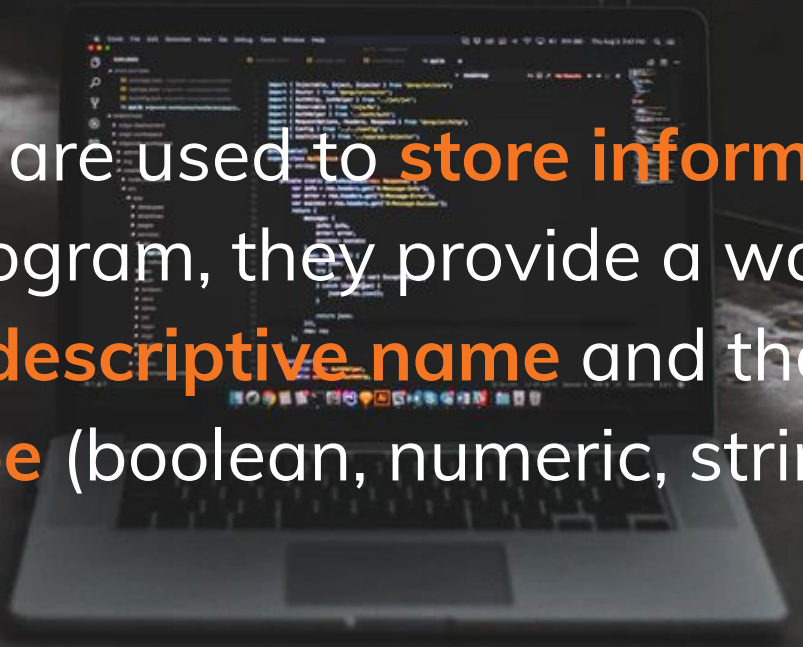
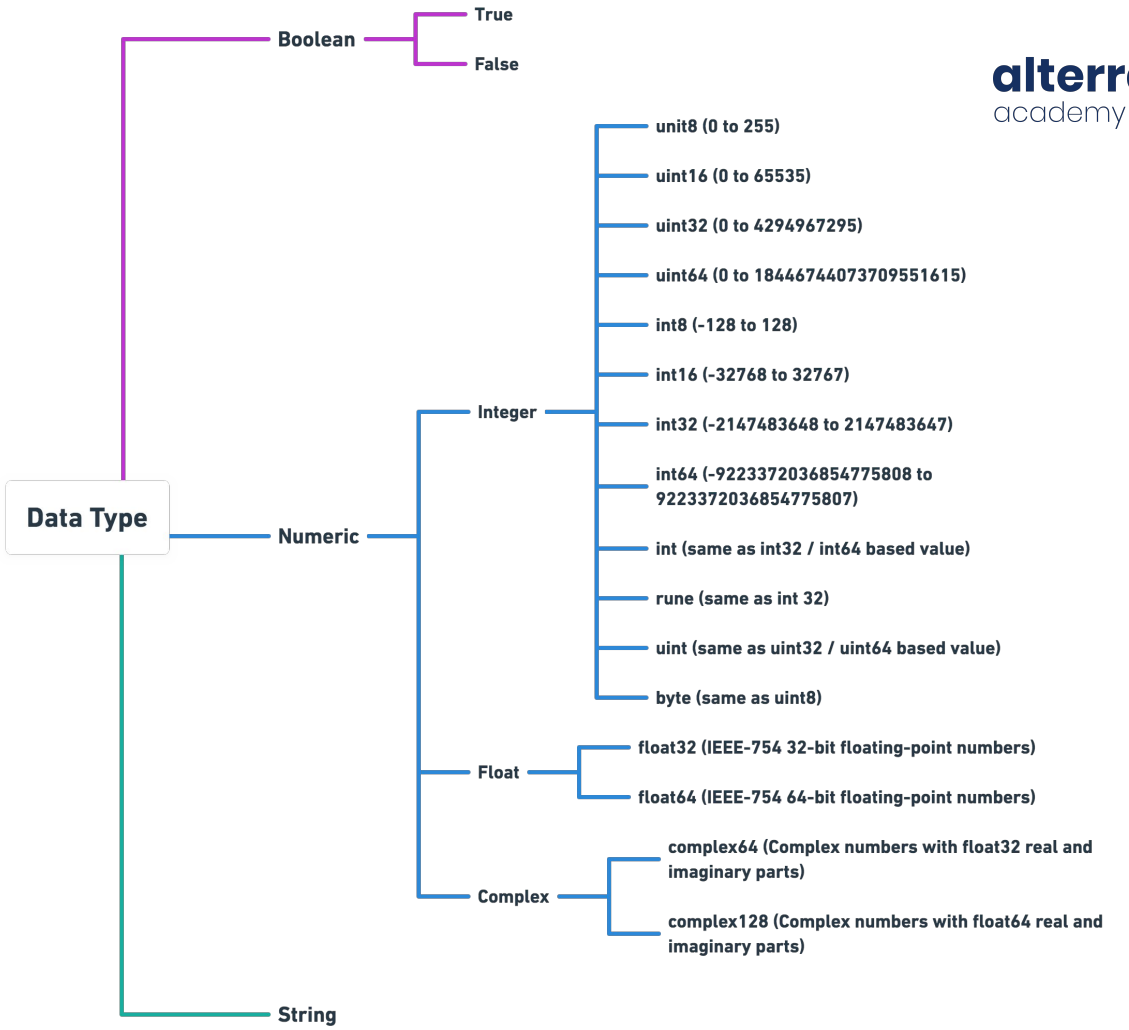
WHAT IS VARIABLES ?

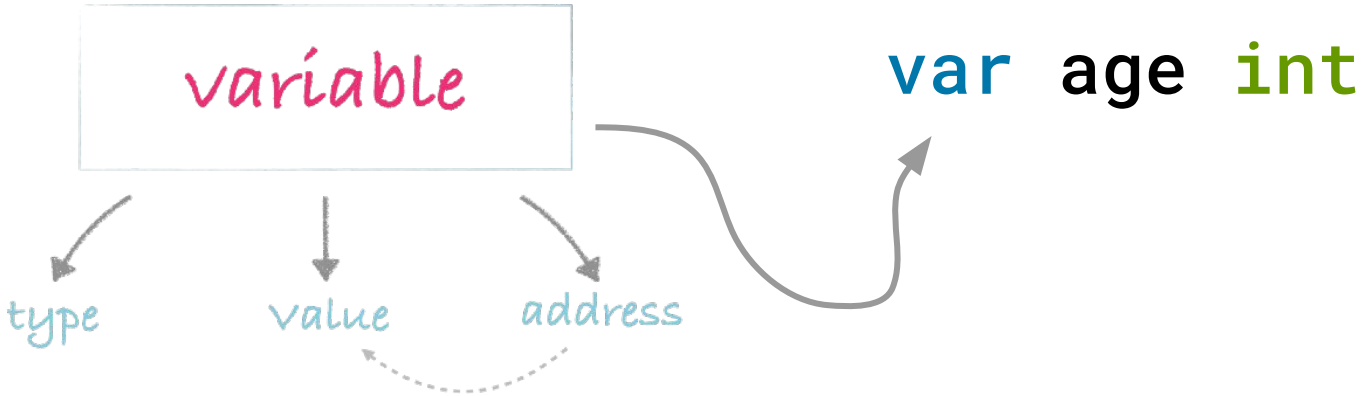


Variables are used to **store information** in a computer program, they provide a way of labeling data with a **descriptive name** and they have **data type** (boolean, numeric, string).

DATA TYPE IN GOLANG



VARIABLE DECLARATION



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TYPE DECLARATION

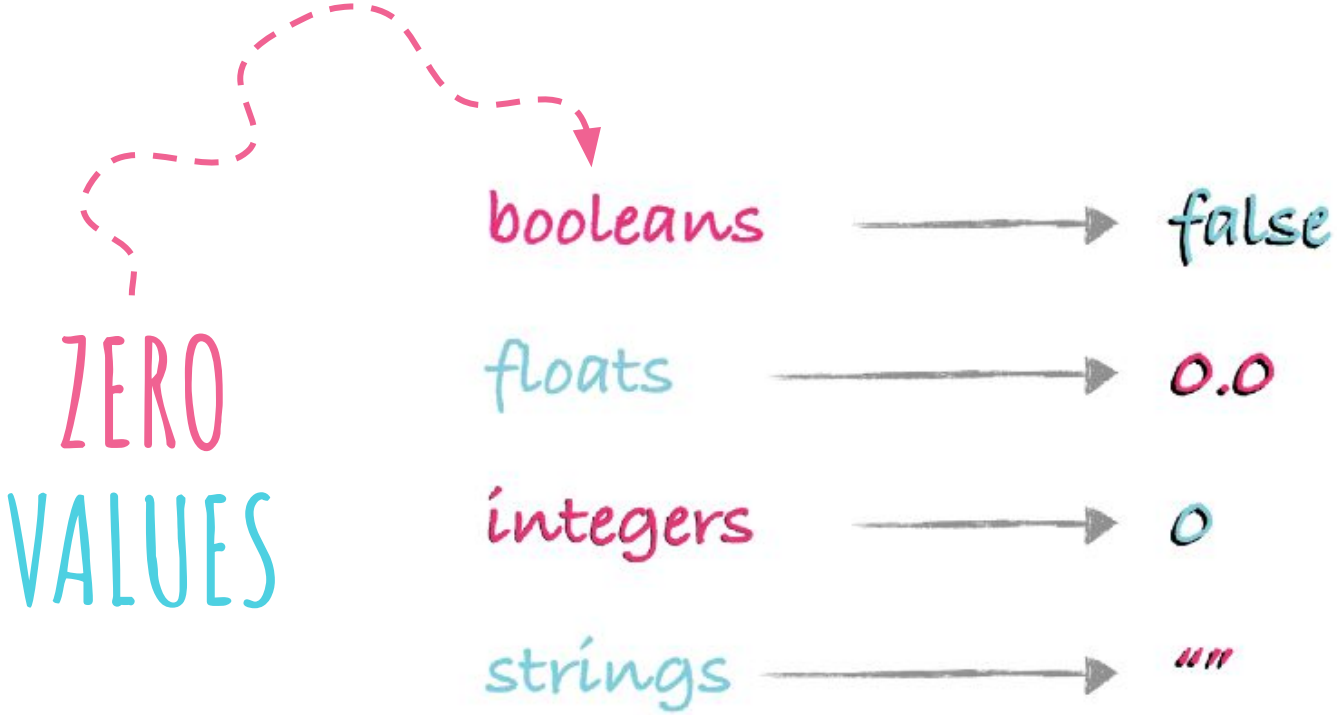
Long

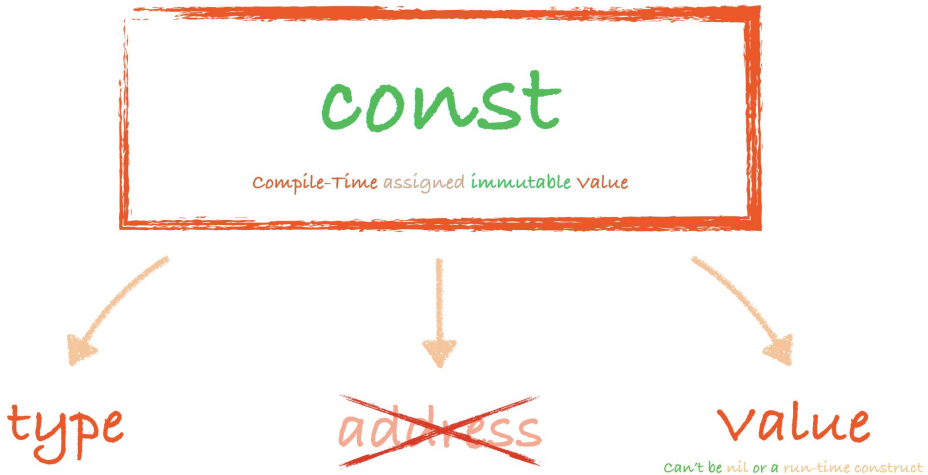
```
var <variable_name> <type_data>
    └── var name string

var <variable_name> <type_data> = <value>
    └── var name string = “moryku”

var <list_variable_name> <type_data>
    └── var name, gender string

var <list_variable_name> <type_data> = <value>
    └── var name, gender string = “moryku”, ”L”
```

Short

```
<variable_name> := <value>
    └── name := “moryku”
```

LIVE


ZERO VALUES
booleans
false
floats
0.0
integers
0
strings
""


const
Compile-Time assigned immutable value
type
address
value
Can't be nil or a run-time construct

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Single Constants

```
const Pi float64 = 3.14
```

declare — name — type — value (64 bit precision)

Multiple Constants

```
const (
    Pi float64 = 3.14
    Pi2
    Age = 10
)
```

- `Pi`: declares a float64 constant with a value of 3.14
- `Pi2`: repeats the type; repeats the value; declares the same float64 constant with a value of 3.14
- `Age = 10`: declares an int constant with a value of 10

Example </> Variable declaration

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-code editor

```go
package main

import "fmt"

func main() {
 // declaration boolean with assignment
 var isLogin bool = false
 fmt.Println(isLogin)
 // declaration numeric integer
 var prime int = 7
 fmt.Println(prime)
 // declaratio decimal number
 var decimal float64 = 45.6
 fmt.Println(decimal)
 // declaration string
 var hello string = "Hello World!"
 fmt.Println(hello)
 // declaration const
 const pi = 3.14159265358979323846
 fmt.Println(pi)
}
```

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Operator

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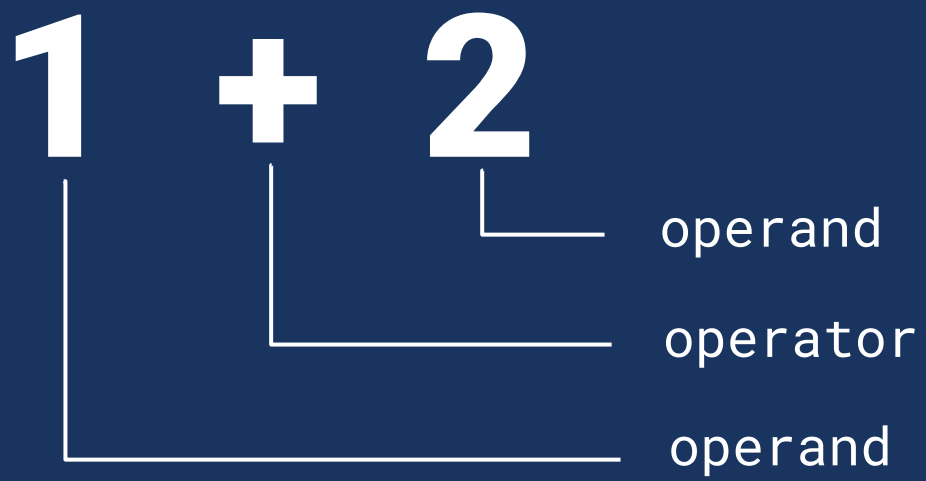
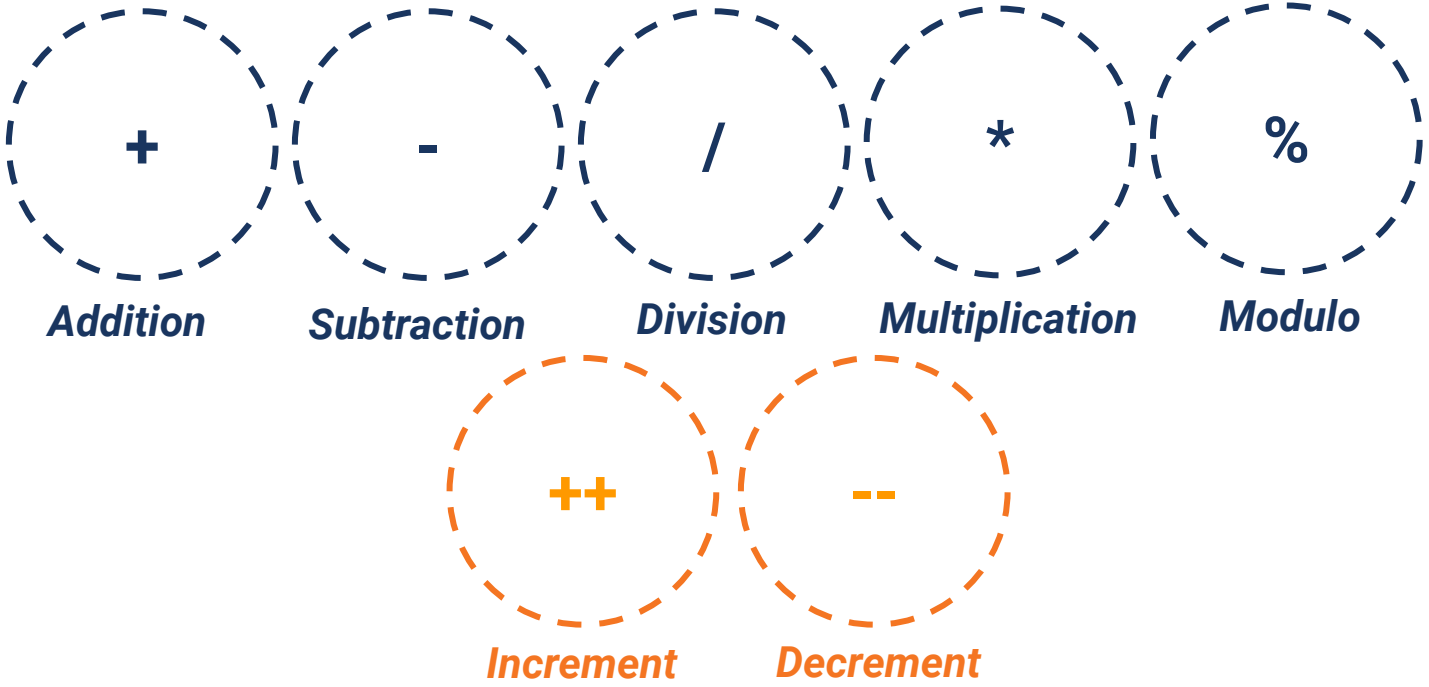


ARITHMETIC OPERATORS



Example </> Using Arithmetic Operator

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-code editor

```go
package main

import "fmt"

func main() {
  // number operation
  a := 10
  t := 15
  L := (a * t) / 2
  fmt.Println(L)

  // string operation
  helloworld := "hello" + " " + "world"
  fmt.Println(helloworld)
}
```

OPERATOR IN GOLANG

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- Arithmetic
  - ex : `+, -, *, /, %, ++, --`
- Comparison
  - ex : `==, !=, >, <, >=, <=`
- Logical
  - ex : `&&, ||, !`
- Bitwise
  - ex : `&, |, ^, <<, >>`
- Assignment
  - ex : `=, +=, -=, *=, /=, %=, <<=, >>=, &=, ^=, |=`
- Miscellaneous
  - ex : `&, * (Pointer)`

Example </>

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-code editor

```go
package main
import "fmt"

func main() {
  a := 1 * 2  // Arithmetic
  b := a > 0  // Relational & Assignment
  c := a >> 1 // Bitwise
  d := &c     // Miscellaneous
  fmt.Println(a, b, c, d)
}
```

command line

```
2 true 1 0xc000084000
```

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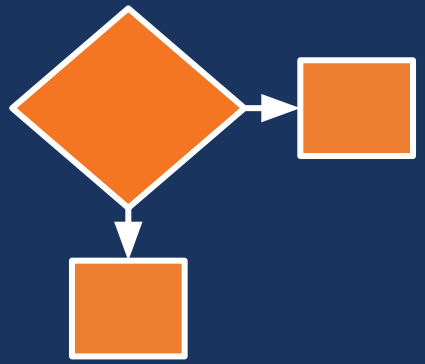

CONTROL STRUCTURES BRANCHING & LOOPING

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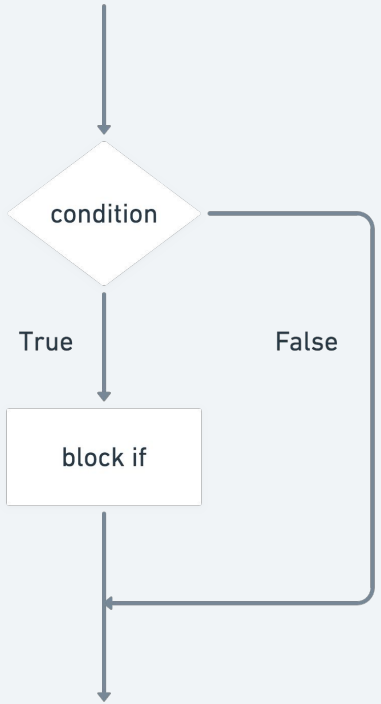
CONTROL STRUCTURES

There are only a few **control structures** in Go.
to branching we use **if** and **switch**,
to write loops we use the **for** keyword.

IF STATEMENT WITH COMPARISON

-code editor

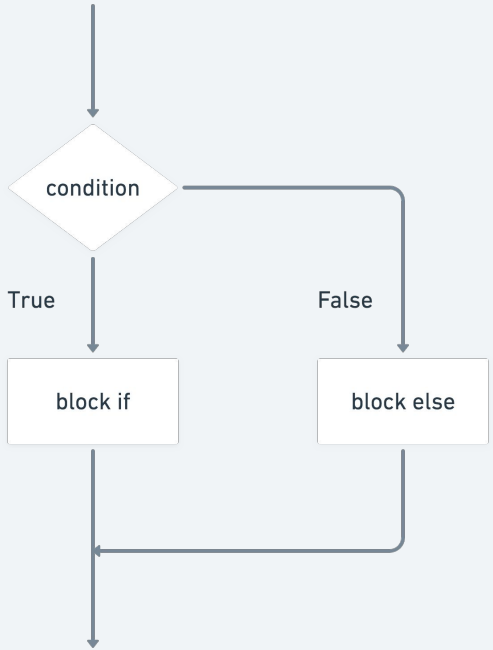
```
var myAge = 17

if myAge == 5 {
  fmt.Println("You too young")
}
if (myAge == 17) {
  fmt.Println("So Sweet")
}
if myAge >= 17 && myAge <= 30 {
  fmt.Println("My Age is between 17 and 30")
}
if dadAge := 9; dadAge < myAge {
  fmt.Println(dadAge)
}
```



IF ELSE STATEMENT

-code editor

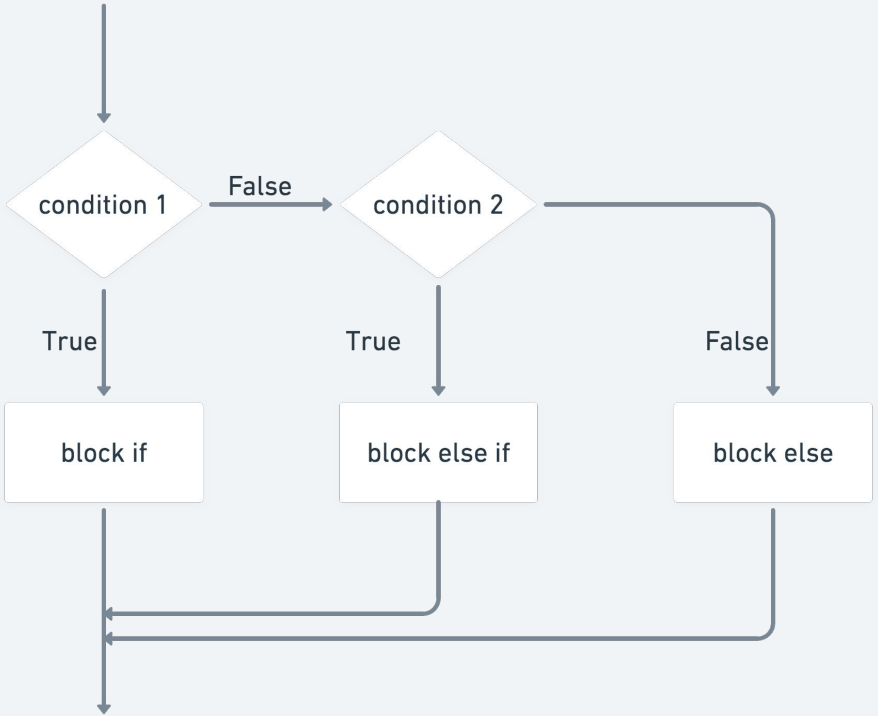
```
number := 4
if number%2 == 0 {
   fmt.Println("Genap")
} else {
   fmt.Println("Ganjil")
}
```



IF, ELSE IF, ELSE

-code editor

```
hour := 15
if hour < 12 {
  fmt.Println("Selamat Pagi")
} else if hour < 18 {
  fmt.Println("Selamat Sore")
} else {
  fmt.Println("Selamat Malam")
}
```



NESTED IF STATEMENT

-code editor

```
var v1 int = 400
var v2 int = 700

if v1 == 400 {
    if v2 == 700 {
      fmt.Printf("Value of v1 is 400 and v2 is 700\n" );
    }
}
```

SWITCH </>

```
switch expression {
    case value1:
        statement(s)
    case value2:
        statement(s)
    default:
        statement(s)
}
```

-code editor

```
var today int = 2
switch today {
    case 1:
        fmt.Printf("Today is Monday")
    case 2:
        fmt.Printf("Today is Tuesday")
    default:
        fmt.Printf("Invalid Date")
}
```

command line

```
Today is Tuesday
```

SWITCH WITHOUT EXPRESSION

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```
switch {
    case expression==value1:
        statement(s)
    case expression==value2:
        statement(s)
    default:
        statement(s)
}
```

-code editor

```
var today int = 2
switch {
    case today == 1:
        fmt.Printf("Today is Monday")
    case today == 2:
        fmt.Printf("Today is Tuesday")
    default:
        fmt.Printf("Invalid Date")
}
```

command line

```
Today is Tuesday
```

FALLTHROUGH >_

In Go the control comes out of the switch statement immediately after a case is executed. A fallthrough statement is used to transfer control to the first statement of the case that is present immediately after the case which has been executed.

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-code editor

```
value := 42
switch value {
case 100:
  fmt.Println(100)
  fallthrough
case 42:
  fmt.Println(42)
  fallthrough
case 1:
  fmt.Println(1)
  fallthrough
default:
  fmt.Println("default")
}
```

command line

```
42
1
default
```

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LOOPS

statement which allows code to be repeatedly executed.

```
for init; condition; post {
  // run commands till condition is true
}
```

-code editor

```go
package main
import "fmt"
func main() {
  for i := 0; i < 5; i++ {
    fmt.Println(i)
  }
}
```

command line

```
0
1
2
3
4
```

WHILE

For is Go's "while"

At that point you can drop the semicolons: C's while is spelled for in Go.

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-code editor

```
package main

import "fmt"

func main() {
  sum := 1
  for sum < 10 {
    sum += sum
  }
  fmt.Println(sum)
}
```

command line

```
16
```

Continue & break

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-code editor

```go
package main
import "fmt"
func main() {
  for i := 0; i < 5; i++ {
    if i == 1 {
      continue
    }
    if i > 3 {
      break
    }
    fmt.Println(i)
  }
}
```

command line

```
0
2
3
```

Loops Over String

command line

```
character H starts at byte position 0
character e starts at byte position 1
character l starts at byte position 2
character l starts at byte position 3
character o starts at byte position 4
-----
H
e
l
l
o
```

-code editor

```go
package main

import (
  "fmt"
)

func main() {
  sentence := "Hello";

  for i := 0; i < len(sentence); i++ {
    fmt.Println(string(sentence[i]))
  }

  fmt.Println("-----")

  for pos, char := range sentence {
      fmt.Printf("character %c starts at byte position %d\n", char, pos)
  }
}
```

Advance looping (1)

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-code editor

```go
package main

import "fmt"

func main() {
 N := 5
 for i := 0; i < N; i++ {
   for j := 0; j < N; j++ {
     fmt.Print("*")
   }
   fmt.Println()
 }
}
```

command line

```
*****
*****
*****
*****
*****
```

Advance looping (2)

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-code editor

```go
package main

import "fmt"

func main() {
 N := 5
 for i := 0; i < N; i++ {
   for j := 0 ; j <= i; j++ {
     fmt.Print("*")
   }
   fmt.Println()
 }
}
```

command line

```
*
**
***
****
*****
```

“Talk is cheap. Show me the code.”

~ Linus Torvalds