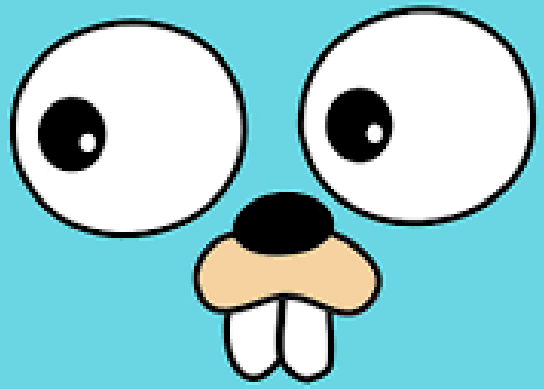


Phase 1: Introduction to Golang (Sessions 1-8)

Objective: Build a strong foundation in Golang basics.

Session 2: Basic Syntax and Data Types

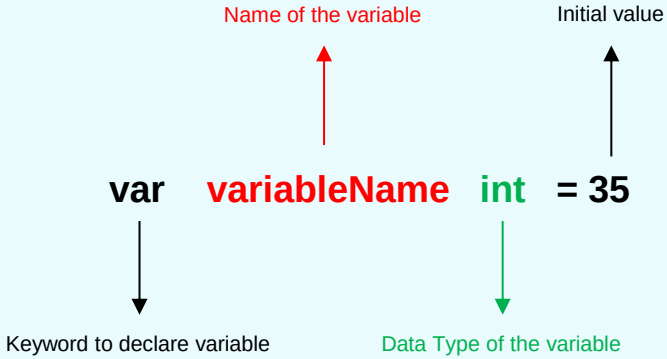
Discussion Points

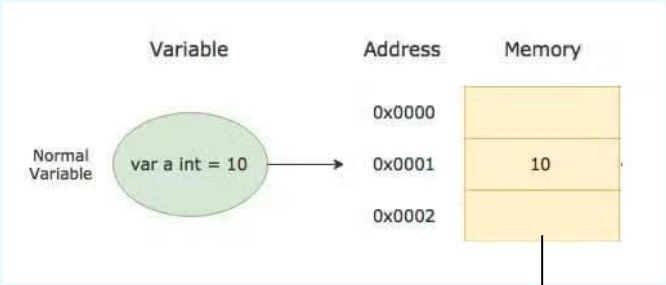
- Variables, constants, and types
- Basic data types: int, float, string, bool
- Type conversions

Variables, constants, and types

What is Variable?

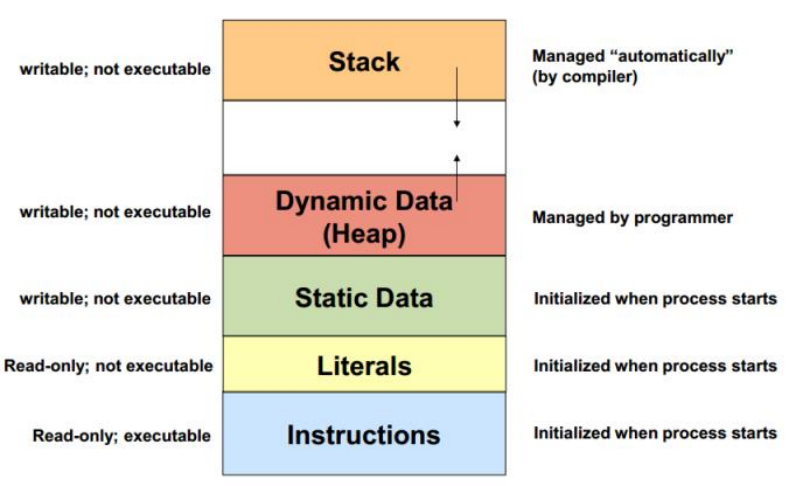
A variable in Go is a storage location paired with an associated symbolic name (an identifier) that contains some known or unknown quantity of information (a value).





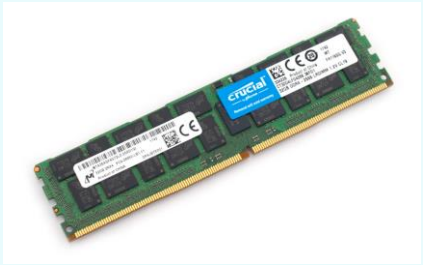
Variables, constants, and types

What is Variable?



Local variables and parameters that do not escape the function scope.

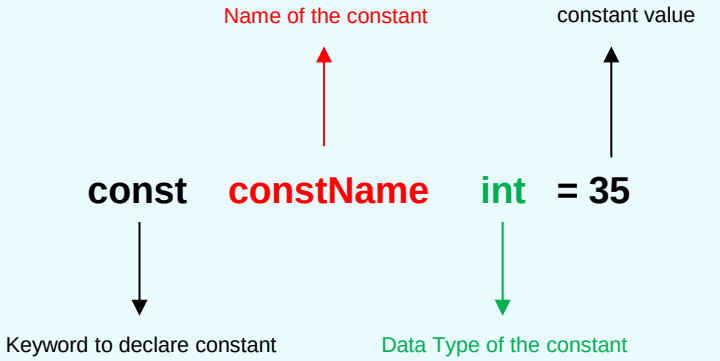
Variables that escape the function scope and need to live beyond the function's execution

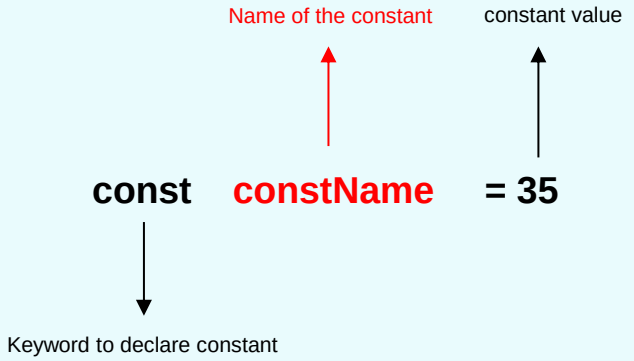


Variables, constants, and types

What is Constant?

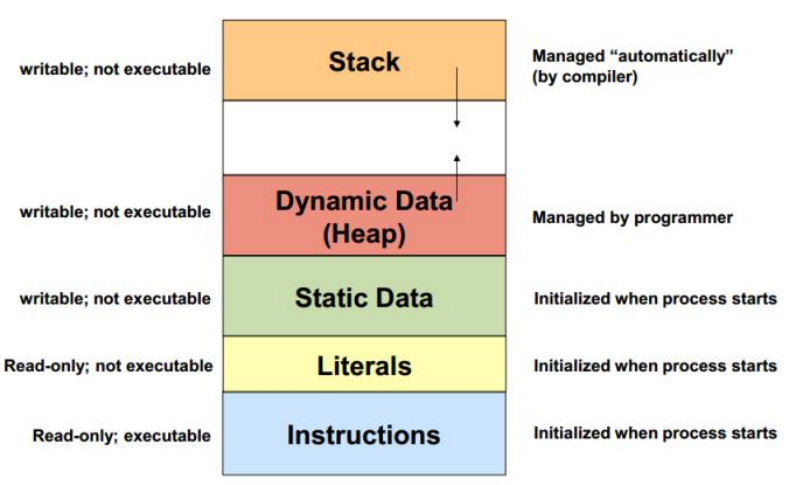
Constants are like variables, but their values cannot be changed after they are defined. They are particularly useful for values that remain consistent throughout your program's execution.





Variables, constants, and types

What is Constant?

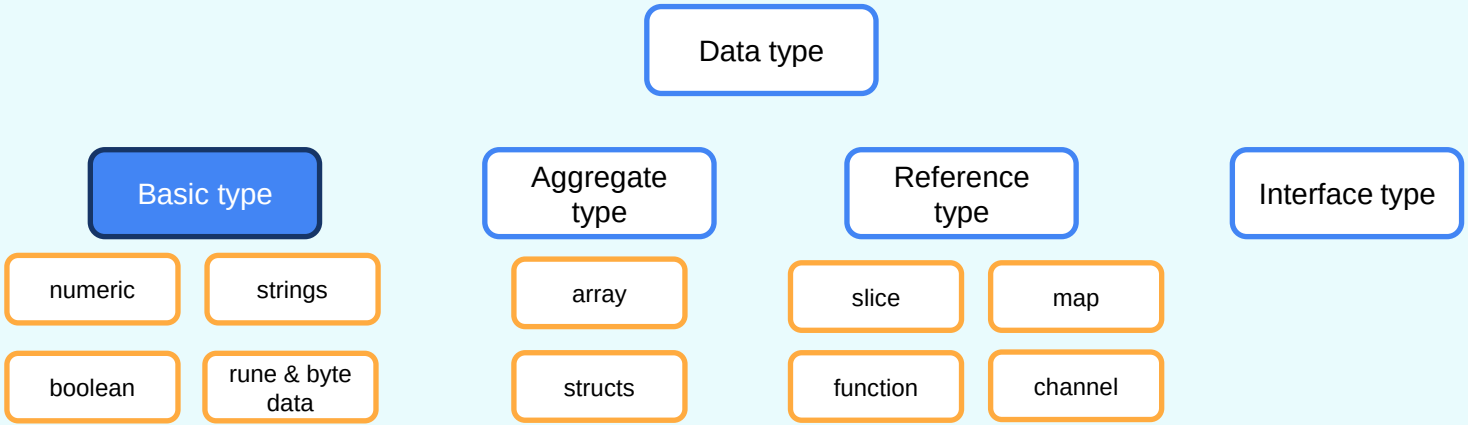


constants are handled by the compiler and embedded in a way that optimizes for space and performance, often directly in the instruction set or in static sections of the program's binary.

Variables, constants, and types

What is Data Type?

In Go, a data type is a classification or categorization of values that determines how they can be stored, manipulated, and used in a program. Go is a statically typed language, which means that the data type of a value is explicitly declared when you define a variable.



Basic data types: int, float, string, bool

What is numeric data type ?

Numeric data types form the foundation of any programming language. Go provides various numeric types, each with its own range and memory size

numeric

Integers **(int)**

Unsigned Integers **(uint)**

Floating-Point Numbers **(float)**

Basic data types: int, float, string, bool

What is int?

Integers represent whole numbers and can be signed (positive or negative). Go offers multiple integer types, including **int, int8, int16, int32, and int64**, each with different ranges and memory sizes.

int: Represents signed integers. The size of int depends on the platform (32-bit or 64-bit).

int8: Range from **-128 to 127**

int16: Range from **-32,768 to 32,767**

int32 (also known as rune): Range from **-2,147,483,648 to 2,147,483,647**

int64: Range from **-9,223,372,036,854,775,808 to 9,223,372,036,854,775,807**

Basic data types: int, float, string, bool

What is uint?

Unsigned integers only represent positive whole numbers. Go provides unsigned integer types, such as **uint, uint8, uint16, uint32,** and **uint64**

uint: Represents unsigned integers. Like int, its size depends on the platform(32-bit or 64-bit).

uint8: Range from 0 to 255

uint16: Range from 0 to 65,535

uint32: Range from 0 to 4,294,967,295

uint64: Range from 0 to 18,446,744,073,709,551,615

Basic data types: int, float, string, bool

What is float?

Floating-point types are used to represent real numbers that can have fractional components (i.e., numbers with decimals). Unlike integers, floating-point numbers are used when precision is needed for very large or very small values, particularly when decimal places are important (e.g., scientific calculations, financial applications).

float32: A 32-bit floating-point number that can represent real numbers with a limited range and precision.

Max ~ 3.40282346638528859811704183484516925440e+38

float64: A 64-bit floating-point number, commonly referred to as a double in other languages.

It provides a wider range and greater precision compared to float32.

Max ~ 1.797693134862315708145274237317043567981e+308

Basic data types: int, float, string, bool

What is boolean data type ?

The **boolean** data type, represented as bool, is essential for conditional statements and decision-making in programs.

boolean

Represents **true** or **false** values.

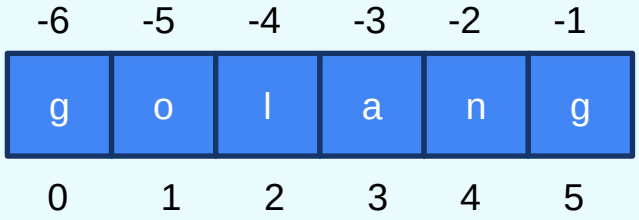
Used for conditional logic and decision-making.

Basic data types: int, float, string, bool

What is string data type ?

Strings are used to represent sequences of characters in Go. They play a crucial role in text processing and manipulation.

strings



- Represents a sequence of characters.
- Strings are **immutable**, they cannot be modified once created.
- Each byte in a Go string can hold values from 0 to 255.
- ASCII characters take up 1 byte each.
- Unicode characters can take up to 4 bytes.
- The maximum size of a Go string is around 2 GB.

Basic data types: int, float, string, bool

What is rune and byte type ?

The rune data type represents a Unicode code point. It's used to work with characters from different languages and scripts. Runes are enclosed in single quotes, like 'A' or '東'.

The byte data type represents a single byte of binary data. It's commonly used when dealing with raw binary data, file I/O, and network communication. Bytes are also used to represent ASCII characters.

Runes and bytes serve distinct purposes:

- Use runes when working with characters from various languages, ensuring proper representation
- Use bytes for handling binary data, such as files, images, or network communication.

Type conversions

What is type conversion?

In Go, perform add or subtract (or any arithmetic) operations ca be performed on variables to two different data types. Hence, variables first must be converted to the same data type.

type (expression)

Common Conversions:

- int to float64
- float64 to int
- int to string (using strconv package)
- string to int (using strconv package)

Session Quiz

Go?

Join at
slido.com
#3144339

Thank you.
Questions?

- **Variables, constants, and types**
- **Basic data types: int, float, string, bool**
- **Type conversions**

“Learn from yesterday, live for today, hope for tomorrow. The important thing is not to stop questioning.”

- Albert Einstein