SULTAN

56189

BS/DS-5_1

Golang (Go) Programming Language

Introduction

Golang, commonly known as Go, is an open-source programming language developed by Google in 2007 and officially released in 2009. It was designed by Robert Griesemer, Rob Pike, and Ken Thompson. Go combines the efficiency of compiled languages like C with the simplicity of interpreted languages like Python. It is statically typed, compiled, and built for scalability and performance, making it a top choice for modern cloud, server, and distributed applications.

Uses of Golang

Go is widely used for backend web development, cloud infrastructure, DevOps tools, and network programming. Its concurrency model using goroutines and channels makes it ideal for handling multiple tasks efficiently.

Applications in Data Science

While Go is not as dominant in data science as Python, it is increasingly being used for high-performance data processing, real-time analytics, and building scalable data pipelines. Its strong concurrency support and speed make it suitable for big data systems and microservices handling large volumes of streaming data.

Real-Life Example

A great example of Go's real-world use is in Docker and Kubernetes, both of which are written in Go. These technologies revolutionized cloud computing and container orchestration, showing how Go's simplicity, speed, and scalability make it perfect for high-performance backend systems.

Comparison: Go vs Python vs C++

Feature	Go (Golang)	Python	C++
Typing	Static	Dynamic	Static
Compilation	Compiled	Interpreted	Compiled
Speed	Fast	Moderate	Very Fast
Ease of Use	Easy	Very Easy	Moderate
Concurrency	Built-in (goroutines)	Threading (limited)	Threading/Manual
Use Case	Cloud, Backend, Networking	AI, Data Science, Automation	System Software, Games

Sample Golang Syntax

```
package main

import "fmt"

func main() {

	// string variables
	var nameOne string = "mario"
	var nameTwo = "sultan"
	var nameThree string

	fmt.Print(nameOne, nameTwo, nameThree)

	nameOne = "peach"
	nameThree = "bowser"

	fmt.Print(nameOne, nameTwo, nameThree)
```

```
    // the following is allowed inside functions only
    nameFour := "ali"
    fmt.Print(nameFour)

    // int variables
    var ageOne int = 20
    var ageTwo = 30
    ageThree := 40

    fmt.Print(ageOne, ageTwo, ageThree)

    // bits & memory
    // var numOne int8 = 25
    // var numTwo int8 = 128 // too large a number for 8-bit
    // var numTwo uint = -25 unsigned ints cannot be negative

    var scoreOne float32 = 25.98
    var scoreTwo float64 = 1965385877.5
    var scoreThree = 1.5 // inferred as float64

    fmt.Print(scoreOne, scoreTwo, scoreThree)

}
```

Conclusion

Golang is a powerful and efficient language that bridges the gap between simplicity and performance. Its modern design, concurrency model, and cross-platform capabilities make it ideal for building scalable, high-performance applications in cloud computing, networking, and backend systems. While it is still emerging in data science, its potential in data engineering and big data processing is immense.

GITHUB LINK

https://github.com/sultanali543/INTRO-TO-GOLANG-GO-