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Go started in September 2007 when Robert Griesemer, Ken Thompson, and I began discussing a new language to address the engineering challenges we and our colleagues at Google were facing in our daily work. When we first released Go to the public in November 2009, we didn't know if the language would be widely adopted or if it might influence future languages. Looking back from 2020, Go has succeeded in both ways: it is widely used both inside and outside Google, and its approaches to network concurrency and software engineering have had a noticeable effect on other languages and their tools. Go has turned out to have a much broader reach than we had ever expected. Its growth in the industry has been phenomenal, and it has powered many projects at Google. — Rob Pike The following stories are a small sample of the many ways that Go is used at Google. How Google's Core Data Solutions Team Uses Go Google's mission is "to organize the world's information and make it universally accessible and useful." One of the teams responsible for organizing that information is Google's Core Data Solutions team. The team, among other things, maintains services to index web pages across the globe. These web indexing services help support products like Google Search by keeping search results updated and comprehensive, and they're written in Go. Learn more Chrome Content Optimization Service Runs on Go When the product Chrome comes to mind, you probably think solely of the user-installed browser. But behind the scenes, Chrome has an extensive fleet of backends. Among these is the Chrome Optimization Guide service. This service forms an important basis for Chrome's user experience strategy, operating in the critical path for users, and is implemented in Go. Learn more How the Firebase Hosting Team Scaled With Go The Firebase Hosting team provides static web hosting services for Google Cloud customers. They provide a static web host that sits behind a global content delivery network, and offer users tools that are easy to use. The team also develops features that range from uploading site files to registering domains to tracking usage. Learn more Actuating Google Production: How Google's Site Reliability Engineering Team Uses Go Google runs a small number of very large services. Those services are powered by a global infrastructure covering everything one needs: storage systems, load balancers, network, logging, monitoring, and many more. Nevertheless, it is not a static system - it cannot be. Architecture evolves, new products and ideas are created, new versions must be rolled out, configs pushed, database schema updated, and more. We end up deploying changes to our systems dozens of times per second. Learn more Google is a technology company whose mission is to organize the world's information and make it universally accessible and useful. Go was created at Google in 2007 to improve programming productivity in an era of multi-core networked machines and large codebases. Today, over 10 years since its public announcement in 2009, Go's use inside Google has grown tremendously. To start using Go, you need two things: A text editor, like VS Code, to write Go code A compiler, like GCC, to translate the Go code into a language that the computer will understand There are many text editors and compilers to choose from. In this tutorial, we will use an IDE (see below). Go Install You can find the relevant installation files at . Follow the instructions related to your operating system. To check if Go was installed successfully, you can run the following command in a terminal window: go version Which should show the version of your Go installation. Go Install IDE An IDE (Integrated Development Environment) is used to edit AND compile the code. Popular IDE's include Visual Studio Code (VS Code), Vim, Eclipse, and Notepad. These are all free, and they can be used to both edit and debug Go code. Note: Web-based IDE's can work as well, but functionality is limited. We will use VS Code in our tutorial, which we believe is a good place to start. You can find the latest version of VS Code at . Go Quickstart Let's create our first Go program. Launch the VS Code editor Open the extension manager or alternatively, press Ctrl + Shift + x In the search box, type "go" and hit enter Find the Go extension by the GO team at Google and install the extension After the installation is complete, open the command palette by pressing Ctrl + Shift + p Run the Go: Install/Update Tools command Select all the provided tools and click OK VS Code is now configured to use Go. Open up a terminal window and type: go mod init example.com/hello Do not worry if you do not understand why we type the above command. Just think of it as something that you always do, and that you will learn more about in a later chapter. Create a new file (File > New File). Copy and paste the following code and save the file as helloworld.go (File > Save As): package main import ("fmt") func main() { fmt.Println("Hello World!") } Now, run the code: Open a terminal in VS Code and type: go run .\helloworld.go Congratulations! You have now written and executed your first Go program. If you want to save the program as an executable, type and run: go build .\helloworld.go When learning Go at W3Schools.com, you can use our "Try it Yourself" tool. It shows both the code and the result. This will make it easier for you to understand every part as we move forward: Code: package main import ("fmt") func main() { fmt.Println("Hello World!") } Result: Hello World! Try it Yourself » In this tutorial, you'll get a brief introduction to Go programming. Along the way, you will install Go, write some simple "Hello, world" code, use the go command to run your code, use the Go package discovery tool, and call functions of an external module. The Go programming language is an open source project to make programmers more productive. Go is expressive, concise, clean, and efficient. Its concurrency mechanisms make it easy to write programs that get the most out of multicore and networked machines, while its novel type system enables flexible and modular program construction. Go compiles quickly to machine code yet has the convenience of garbage collection and the power of run-time reflection. It's a fast, statically typed, compiled language that feels like a dynamically typed, interpreted language. Instructions for downloading and installing Go. Tutorial: Getting started A brief Hello, World tutorial to get started. Learn a bit about Go code, tools, packages, and modules. Tutorial: Create a module A tutorial of short topics introducing functions, error handling, arrays, maps, unit testing, and compiling. Tutorial: Getting started with multi-module workspaces Introduces the basics of creating and using multi-module workspaces in Go. Multi-module workspaces are useful for making changes across multiple modules. Tutorial: Developing a RESTful API with Go and Gin Introduces the basics of writing a RESTful web service API with Go and the Gin Web Framework. Tutorial: Getting started with generics With generics, you can declare and use functions or types that are written to work with any of a set of types provided by calling code. Tutorial: Getting started with fuzzing Fuzzing can generate inputs to your tests that can catch edge cases and security issues that you may have missed. Writing Web Applications Building a simple web application. How to write Go code This doc explains how to develop a simple set of Go packages inside a module, and it shows how to use the go command to build and test packages. A Tour of Go An interactive introduction to Go in four sections. The first section covers basic syntax and data structures; the second discusses methods and interfaces; the third is about Generics; and the fourth introduces Go's concurrency primitives. Each section concludes with a few exercises so you can practice what you've learned. You can take the tour online or install it locally with: $ go install golang.org/x/website/tour@latest This will place the tour binary in your GOPATH's bin directory. A document that gives tips for writing clear, idiomatic Go code. A must read for any new Go programmer. It augments the tour and the language specification, both of which should be read first. Frequently Asked Questions (FAQ) Answers to common questions about Go. Editor plugins and IDEs A document that summarizes commonly used editor plugins and IDEs with Go support. Diagnostics Summarizes tools and methodologies to diagnose problems in Go programs. A Guide to the Go Garbage Collector A document that describes how Go manages memory, and how to make the most of it. Managing dependencies When your code uses external packages, those packages (distributed as modules) become dependencies. Fuzzing Main documentation page for Go fuzzing. Coverage for Go applications Main documentation page for coverage testing of Go applications. Profile-guided optimization Main documentation page for profile-guided optimization (PGO) of Go applications. The documentation for the Go standard library. Command Documentation The documentation for the Go tools. Language Specification The official Go Language specification. Go Modules Reference A detailed reference manual for Go's dependency management system. go.mod file reference Reference for the directives included in a go.mod file. The Go Memory Model A document that specifies the conditions under which reads of a variable in one goroutine can be guaranteed to observe values produced by writes to the same variable in a different goroutine. Contribution Guide Contributing to Go. Release History A summary of the changes between Go releases. Introduces the basics of accessing a relational database using Go and the database/sql package in the standard library. Accessing relational databases An overview of Go's data access features. Opening a database handle You use the Go database handle to execute database operations. Once you open a handle with database connection properties, the handle represents a connection pool it manages on your behalf. Executing SQL statements that don't return data For SQL operations that might change the database, including SQL INSERT, UPDATE, and DELETE, you use Exec methods. Querying for data For SELECT statements that return data from a query, using the Query or QueryRow method. Using prepared statements Defining a prepared statement for repeated use can help your code run a bit faster by avoiding the overhead of re-creating the statement each time your code performs the database operation. Executing transactions sql.Tx exports methods representing transaction-specific semantics, including Commit and Rollback, as well as methods you use to perform common database operations. Canceling in-progress database operations Using context.Context, you can have your application's function calls and services stop working early and return an error when their processing is no longer needed. Managing connections For some advanced programs, you might need to tune connection pool parameters or work with connections explicitly. Avoiding SQL injection risk You can avoid an SQL injection risk by providing SQL parameter values as sql package function arguments You can collect related packages into modules, then publish the modules for other developers to use. This topic gives an overview of developing and publishing modules. Module release and versioning workflow When you develop modules for use by other developers, you can follow a workflow that helps ensure a reliable, consistent experience for developers using the module. This topic describes the high-level steps in that workflow. Managing module source When you're developing modules to publish for others to use, you can help ensure that your modules are easier for other developers to use by following the repository conventions described in this topic. Organizing a Go module What is the right way to organize the files and directories in a typical Go project? This topic discusses some common layouts depending on the kind of module you have. Developing a major version update A major version update can be very disruptive to your module's users because it includes breaking changes and represents a new module. Learn more in this topic. Publishing a module When you want to make a module available for other developers, you publish it so that it's visible to Go tools. Once you've published the module, developers importing its packages will be able to resolve a dependency on the module by running commands such as go get. Module version numbering A module's developer uses each part of a module's version number to signal the version's stability and backward compatibility. For each new release, a module's release version number specifically reflects the nature of the module's changes since the preceding release. Three things that make Go fast, fun, and productive: interfaces, reflection, and concurrency. Builds a toy web crawler to demonstrate these. Code that grows with grace One of Go's key design goals is code adaptability; that it should be easy to take a simple design and build upon it in a clean and natural way. In this talk Andrew Gerrand describes a simple "chat roulette" server that matches pairs of incoming TCP connections, and then use Go's concurrency mechanisms, interfaces, and standard library to extend it with a web interface and other features. While the function of the program changes dramatically, Go's flexibility preserves the original design as it grows. Go Concurrency Patterns Concurrency is the key to designing high performance network services. Go's concurrency primitives (goroutines and channels) provide a simple and efficient means of expressing concurrent execution. In this talk we see how tricky concurrency problems can be solved gracefully with simple Go code. Advanced Go Concurrency Patterns This talk expands on the Go Concurrency Patterns talk to dive deeper into Go's concurrency primitives. More See the Go Talks site and wiki page for more Go talks. Guided tours of Go programs. Language Packages Modules Tools The Go Wiki, maintained by the Go community, includes articles about the Go language, tools, and other resources. See the Learn page at the Wiki for more Go learning resources. See the NonEnglish page at the Wiki for localized documentation. Opens in new window. A Tour of Go "At the time, no single team member knew Go, but within a month, everyone was writing in Go and we were building out the endpoints. It was the flexibility, how easy it was to use, and the really cool concept behind Go (how Go handles native concurrency, garbage collection, and of course safety+speed.) that helped engage us during the build. Also, who can beat that cute mascot!" "A small language that compiles fast makes for a happy developer. The Go language is small, compiles really fast, and as a result it lets your mind focus on the actual problem and less on the tool you are using to solve it. Code, test, debug cycles are so quick that you forget you are not working with an interpreted language. Looking at our code, you see less boilerplate and more business logic." "Go has excellent characteristics for scalability and services written using it typically have very small memory footprints. Because code is compiled into a single static binary, services can also be containerised with ease, making it much simpler to build and deploy. These attributes make Go an ideal choice for companies building microservices, as you can easily deploy into a highly available and scalable environment such as Kubernetes." "In our tightly managed environments where we run Go code, we have seen a CPU reduction of approximately 10% with cleaner and maintainable code." "Tooling has always been a problem with our legacy code base... but we have found that Go has excellent tooling, plus built-in testing, benchmarking, and profiling frameworks. It is easy to write efficient and resilient applications. After working on Go, most of our developers don't want to go back to other languages." "...when a programming language is designed for exactly the environment most of us use right now—scalable, cloud-based servers that are optimized for performance—a lot can go right." Go Tutorial Go Programming Language (Introduction) How to Install Go on Windows? How to Install Golang on MacOS? Hello World in Golang Identifiers in Go Language Go Keywords Data Types in Go Go Variables Constants- Go Language Go Operators Functions in Go Language Variadic Functions in Go Anonymous function in Go Language main and init function in Golang What is Blank Identifier(underscore) in Golang? Defer Keyword in Golang Methods in Golang Slices in Golang Slice Composite Literal in Go How to sort a slice of ints in Golang? How to trim a slice of bytes in Golang? How to split a slice of bytes in Golang? Strings in Golang How to Trim a String in Golang? How to Split a String in Golang? Different ways to compare Strings in Golang Go language is a programming language initially developed at Google in the year 2007 by Robert Griesemer, Rob Pike, and Ken Thompson. It is a statically-typed language having syntax similar to that of C. It provides garbage collection, type safety, dynamic-typing capability, many advanced built-in types such as variable length arrays and key-value maps. It also provides a rich standard library. The Go programming language was launched in November 2009 and is used in some of the Google's production systems. This Go language tutorial is created by experienced Go masters after considering in-depth the knowledge of both beginners and professional programmers. This tutorial is simply structured with a step-by-step approach; it eases learning by using practical examples to draw out key concepts. Also, it serves as a fully hands-on guide capturing the syntax and unique features of Golang, enabling software developers to learn and practice building, managing, and optimizing applications with confidence and proficiency. Why to Learn Golang? It is the most important programming language that any student or professional dreams about becoming a master in software development to have those fantastic programming skills. Some of the tough, long reasons why studying the language is worth it are: Golang was created for simplicity and effectiveness, empowering developers to create clean, maintainable code while implementing very complex systems. It gives built-in concurrency support via goroutines and channels that facilitate the writing of scalable applications of high performance. The fundamental design of Golang prioritizes readability, thus simplifying coding and comprehension of the code. The standard library of Golang is widespread, so sophisticated applications can be created without reliance on other libraries. Golang comes with a cross-platform compatibility feature, and hence the code can run across many operating systems, be it Windows, Linux, or macOS. The language assists in developer productivity using a defer for resource management, specialty error handling, and in-built garbage collection. Here is the simple Go language example to print "Hello, World!" on the screen. You can RUN and Edit this example by clicking on Edit & Run button. package main import "fmt" func main() { fmt.Println("Hello, World!") } Online Go Language Compiler We provide an online Go language compiler, where you can write and test your Go language programs. Open Online Go Compiler Go Language Features These qualities combine to make Golang a strong and efficient language for constructing modern software applications. Concurrency with Goroutines and Channels: Golang simplifies concurrent programming by utilizing lightweight goroutines and channels for communication, resulting in scalable and efficient code. Rich Standard Library: Go has a strong built-in library, which consists of facilities that allow I/O networking and data manipulation so that a developer may get rid of all third-party libraries. Defer Statement: The defer statement makes sure that the function will run after the surrounding function execution has been completed and is good for resource management. Cross-Platform Development: With Go, you can build applications that run on different operating platforms using a single code base in Windows, Linux, and macOS. Error Handling: The explicit error-handling system of Golang highlights that it returns error values to be typical code development practices for developing robust and trustable programs. Garbage Collection: The integrated garbage collector automatically manages memory and reduces memory leaks via its uncomplicated memory management system. End memory storage. Well, learning Golang will put strong talents in the hands of developers so that they can build performant, scalable applications quickly and easily. Its simple rollout concurrency architecture, along with its developing ecosystem, makes it a great option for current program implementations. Audience: Who Can Learn Go Language? This tutorial is designed for software programmers with a need to understand the Go programming language from scratch. This tutorial will give you enough understanding on Go programming language from where you can take yourself to higher levels of expertise. Prerequisites to Learn Go Language Before proceeding with this tutorial, you should have a basic understanding of computer programming terminologies. If you have a good command over C language, then it would be quite easy for you to understand the concepts of Go programming and move fast on the learning track. Getting Started with Go Language You can start learning the Go language by following our table of contents linked in the left side navigation menu. Getting started with the Go language withGo language overview.

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