

A Study on Golang and Understanding Why It is Better than Java: Discussing Scope, Application use and Limitations

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Abstract: - Go is also known as Golang which is a open source programming language. It is compiled and has static nature which is discovered by google. It is one of the simplest languages which can be read easily and has higher efficiency rate and high performance as compared to other languages available in the market. The syntax of Golang is similar to C language but Golang comes with added features like memory safety, garbage collection, provides structural typing etc. Golan was discovered because of the increase in complexity of the code in google. The inventors of this language were Rob Pike, Kem Thompson, Robert Griesemer. The contribution of Golang is in the major domains like cloud computing, game development companies, backend programming, Data science etc. It was basically designed for using it in cloud computing. Many big organisations like Google, Netflix, Docker, Heroku etc are using Golang to improve overall business growth. In this paper the scope and purpose of Golang will be discussed. It will explain the benefits of using Golang over java and also its advantages and challenges along with its application uses.

Keywords: - *Introduction to Golang, Features of Golang, Scope of Golang, Advantages of Golang, Limitations of Golang.*

Introduction: -

There are many languages available which are sufficient to develop a software or an application. Every day in IT world, continuous research goes on to enhance and improve the existing technologies and to innovate better and efficient languages as well as technologies. Golang is also one of the latest programming languages which was discovered by three scientists Rob Pike, Kem Thompson, Robert Griesemer. It is an open-source fastest growing programming language which was invented by google and hence it is called as Golang or simply Go. It is a programming language which is used to serve multipurpose like to develop applications which are scalable and faster. It was invented long back but not many developers were using it. But due to the introduction of cloud computing and microservices, many developers have switched to Golang to prepare efficient and improved applications. Cloud computing is the technique where all the services are located at one location online which is known as cloud and can be accessed by anybody who has access to it from any location. Some organisations have their own cloud otherwise they will hire a third-party vendor who can help them to provide a cloud having all the services which the company needs. Microservices are the service-based architecture which is used to build and develop a large application by dividing it into small components where each component will have unique service and serves at least one business goal. With the development of these two

technologies, the developers have shifted to Golang due to its easy-to-use policy. The Golang was discovered due to the fact that it is simple to learn and adapt and also serves as a lean, mean, compilation solution which can be used for situations to handle pressure and in multitasking, and to improve performance of the system or an application. Golang allows the developers to run the code on latest platforms which is easy thing to do and also it can be executed in virtual machines as well as the containers.

Requirements for Golang: - [1]

Following are the two basic requirements for Golang to be installed on computer: -

1. Identify Go Compiler: -

Go dissemination comes as a double installable for FreeBSD (discharge 8 or more), Linux, Mac OS X (Snow Leopard or more), and Windows working frameworks with 32-digit (386) and 64-cycle (amd64) x86 processor designs.

2. Text Editor: -

It is the platform which helps to write the code. Following are the list of few text editors which are used to write the code for Golang: -

- Windows notepad
- OS Edit command
- Brief
- Epsilon

- vm or vi
- Emacs
- VS Cod

Features of Go lang: - [2]

Following are some of the features of Go lang which makes it different and efficient as compared to other languages: -

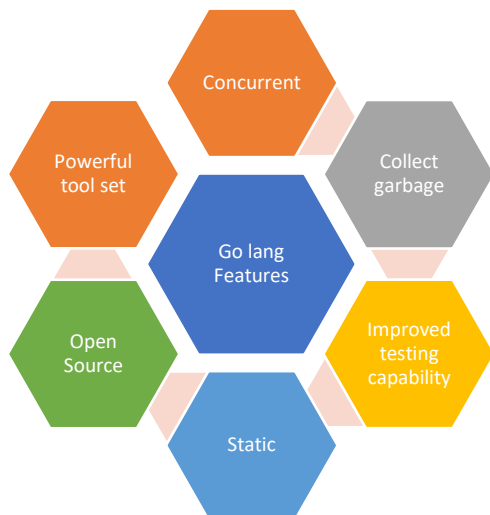


Figure 1 Features of Go lang.

1. Concurrent: -

- This is one of the most important features of the Go lang which is to support concurrency which no other language supports. Go lang provides the feature of concurrency to easily track it with simple options.
- This in turn helps the developers to acknowledge and provide solutions for the requests easily and at a great speed. It is also used to free the allocated resources and provide the network to the resources of top priority.

2. Collect Garbage: -

- This programming language also comes with the benefit of providing facility of garbage collection.
- This means that the developers can easily free up the pointers which are linked to the dangling situations or the pointers.

3. Enhanced testing capabilities: -

- Go lang has improved testing capabilities due to which it has proved to be better language than the other languages available.
- It allows developers to also write unit test cases along with writing the application code which saves a lot of time and energy.
- It also helps to understand the code coverage, and helps to create one's own code documentation.

4. Helps to write static typing: -

- It is statically types programming language which helps to write accurate code and helps to increase the accuracy of the compilation process.
- This is the limitation of the dynamic programming language which is overcome in the static GO language and helps the developers to increase their productivity.

5. Open Source: -

- This is the main feature of the GO lang that it is open-source programming language.
- This means that anybody can download the language and learn it to make use of it in their business or organisation.
- It helps the developers to write improved efficient code and helps them to easily find out the bugs and fix them.

6. Powerful library and Toll set: -

- The Go lang programming language comes in built with robust library which has many components with it. This reduces the pressure of developers to look for third party library to write the code.
- It also comes with a number of tool sets which improves the development process and saves a lot of time and efforts of the developers.
- Some of the tool sets present in Go lang are: -
 - a. GoGet: - It helps to download various libraries from GitHub which makes it easy to import library in the project.
 - b. Gorun: -This tool is useful for the developers when they are using codes which are written in Python language. It is used to add a bang line in the source code to execute it.
 - c. Go Doc: - This tool resolves source code written in GO lang which also includes the comments. It then converts it into plain text or HTML. The documentation done this way is easily navigated.
 - d. Go fmt: - It is used to format Go code automatically.

Components of Golang: - [2]

To learn Go lang, following components of Go lang should be kept in mind. Once one gets hands on experience in Go lang and become a pro in this language, then it can also be used in mobile, web and custom software development.

Components of GO lang are: -

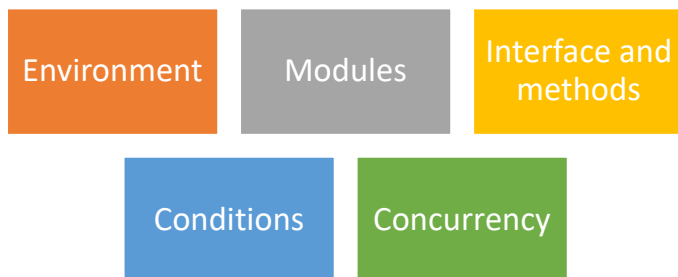


Figure 2 Components/elements of Go lang.

1. Go Lang Environment: -
This is the first step towards learning any new programming language. It means that one should get familiar with the platform and environment used for the Go language which is an advanced platform. One need to learn few Go commands, IDEs, Terminal as well as the bash commands.
2. Modules: -
Modules of GO lang are the set of GO packages which are stored in the file tree. The module path is defined by go.mod file which is located at the root of the file tree. Many advanced and latest packages are available which are used to organise the data and improve the storage.
3. Interfaces and methods and functions: -
If one learns the object-orientation then it is easy for them to learn the various functions, interfaces and methods used for the Go language.
4. Conditional Statements: -
A variety of go conditional commands are available in Golang which allows to test if specific conditions are met or not. With the help of these commands one can identify whether the statements are true or false.
5. Concurrency: -
It is the way to presentation of the various components of the program. With the help of this different computations can be conducted parallely.

Advantages of Golang: - [4]

Following are benefits of using Golang: -

1. Easy to learn: -
It is one of the most easy and simplest form of programming language. A coder who is expert in any programming language can easily learn the Golang.
2. Easy to understand documentation: -
The documentation process of Golang is easy and can be read and understood by anybody. It also supports online community where one may ask their queries if they are stuck while working on Go lang.

3. Quick results: - The time taken to compile a code written in Golang is done at a very great speed so the results are very quick to receive.
4. Flexible and scalable: - The nature of Golang is flexible and it is easily scalable. It is easy to make modifications in Golang.
5. Validation process: - It is also easy to validate the interfaces and type of embedding.

Challenges of go lang: -

Following are few disadvantages of Golang: -

- It has no help for generics, regardless of whether there are numerous conversations about it.
- The bundles conveyed with this programming language is very helpful yet Go isn't so object-situated in the ordinary sense.
- There is nonappearance of certain libraries particularly a UI tool compartment.
- It is time consuming language as it takes a lot of time to write the code as compared to other languages.

Conclusion: -

Go is otherwise called Golang which is an open- source programming language. It is ordered and has static nature which is found by google. It is quite possibly of the least complex language which can be perused effectively and has higher proficiency rate and elite execution when contrasted with different dialects accessible on the lookout. The grammar of Golang is like C language however Golang accompanies added highlights like memory wellbeing, trash assortment, gives underlying composing and so forth. Golan was found due to the expansion in intricacy of the code in google. The designers of this language were Rob Pike, Kem Thompson, Robert Griesemer. The commitment of Golang is in the significant areas like distributed computing, game advancement organizations, backend programming, Data science and so on. It was fundamentally intended for involving it in distributed computing. Numerous enormous associations like Google, Netflix, Docker, Heroku and so forth are utilizing Golang to further develop in general business development.

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