Practical Go Lessons

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Contents

[1]Algorithm from : https://github.com/golang/go/wiki/SliceTricks
[2]Algorithm from : https://github.com/golang/go/wiki/SliceTricks

Foreword

This book is about Go.

My main objective is to teach you the language in a progressive way. I also tried to clarify and explain some common computer science notions that can be difficult to grasp, especially for newcomers.

I started to write it in 2018 during weekends and nights. At the end of 2020, I decided to quit my job to work on it full-time. Those 2.5 years of writing were intense but rewarding.

I share this work for free on the website (https://www.practical-go-lessons.com/). For years I learned so many things from others on the internet. Today, I want to give back to my community!

I want to thank my family for its support, especially my spouse, who brings me joy and happiness every day.

Thank you!

Thank you so much for buying this book! I hope it will help you build great programs.

Feel free to share your progress with me. You can contact me directly via Twitter: https://twitter.com/MaximilienAld

Gopher images

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The creator of the gopher image is Renee French.[3]

The drawings presented on this book have been created by Binliang Peng[4].

Feedback

If you spot an error or suggest an improvement, do not hesitate to share it with me on this page: https://www.practical-go-lessons.com/feedback

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[3] https://en.wikipedia.org/wiki/Ren%C3%A9e_French

[4] https://www.instagram.com/binliang.alexander.peng/

Chapter 1

Programming a computer

1.1 What will you learn in this chapter?

- We will list the different hardware parts of a computer.
- We will see what a program is and how it looks like.
- We will understand how a program is loaded and executed.

1.2 Technical concepts covered

- Memory Unit, Arithmetic and Logic Unit, Input/Output, Control Unit
- Central memory, Auxiliary memory
- Volatile and non-volatile memory
- RAM/ROM
- CPU
- High and low-level languages

- Assembly language, assembler
- Compiled and interpreted language

1.3 Introduction

This book is about Go. Before jumping into our main subject, you need to know some basic knowledge about computers.

Experienced programmers can skip this chapter. Beginners should take some time to study it.

Your programs will run on hardware. Knowing how your hardware is working may improve the design of your programs.

Firstly we will describe the main components of a computer. Then we will see what a program is and how the machine handles it.

1.4 The four hardware components

A computer is composed of **four** main parts :

- **The memory unit (MU)** where data and programs are stored.
  - For instance, we can store into the memory unit the grades of a college class. We can also hold a program that will compute the class's average grade.
- The **arithmetic and logic unit (ALU)**. Its role is to perform arithmetic and logical operations on data stored into the memory unit. This unit can perform, for instance, additions, incrementations, decrementations, which are called **operations**. In general, each operation requires two operands and output a result.
  - Let's say we want to add 5 and 4. Those two numbers are the operands. The result of this operation is 9. Operands are loaded from the memory unit. The ALU is an electrical circuitry that is designed to execute operations.
- The **input and output unit (I/OU)** will be in charge of loading data into the memory unit from an **input** device. This unit also sends data from the memory unit to an **output** device.
  - An input device is, for example, the touchpad of your computer, your keyboard, your mouse.
  - An output device is, for instance, your monitor.
- The **control unit (CU)** will receive instructions from programs and will control the activity of the other units.

The four hardware components represent a **schematic view** of the computer's components.