Tentative Chapters Outline for “Programming with Go”

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1. Sample Programs
2. Packaging and Tooling
    a. Naming Conventions
    b. Declaring
    c. Importing
    d. Program Initialization and Execution
        i. Package Initialization
        ii. Program Execution
    e. The Go Tool
3. Fundamental Building Blocks
    a. Foundational Elements
        i. Characters
        ii. Letters and Digits
    b. Lexical Elements
        i. Literals
            1. Integer Literals
            2. Floating Point Literals
            3. Imaginary Literals
            4. Rune Literals
            5. String Literals
            6. Composite Literals
            7. Function Literals
        ii. Identifiers
                a. Blank
                b. Predeclared
                c. Exported
        iii. Keywords
        iv. Other Lexical Elements
            1. Comments
            2. Tokens
            3. Semicolon
            4. Operators
                a. Arithmetic Operators
                b. Comparison Operators
                c. Logical Operators
                d. Address Operators
                e. Receive Operators
            5. Punctuation

    c. Types
        i. Boolean Types
        ii. Numeric Types
        iii. String Types
        iv. Array Types
        v. Slice Types
        vi. Struct Types
        vii. Pointer Types
        viii. Function Types
        ix. Interface Types
        x. Map Types
        xi. Channel Types
    d. Constants
    e. Variables
    f. Blocks
    g. Declarations, Definitions, and Scope
    h. Expressions
        i. Primary Expressions
        ii. Method Expressions
        iii. Index Expressions
        iv. Slice Expressions
        v. Order of Evaluation
4. Control Structures and Statements
    a. If Statements
    b. Switch Statements
    c. For Statements
    d. Go Statements
    e. Select Statements
    f. Goto Statements
    g. Return
    h. Break
    i. Continue
    j. Fallthrough
    k. Defer
    l. Other Statements
        i. Empty Statements
        ii. Terminating Statements
        iii. Labeled Statements
        iv. Expression Statements
        v. Send Statements
        vi. IncDec Statements
        vii. Assignment Statements
5. Data Input and Output
    a. Single Character Input

    b. Single Character Output
    c. Reading From a File
    d. Writing to a File
    e. Navigating Directories
6. Functions
    a. Function Declarations and Definitions
    b. Multiple Return Values
    c. Function Values
    d. Anonymous Functions
    e. Deferred Function Calls
    f. Panic and Recover
    g. Recursion

7. Some Built-in Functions
    a. Close
    b. Length and Capacity
    c. Allocation
    d. Array Processing
        i. Make
        ii. Append
        iii. Copy
    e. Map Processing
    f. Bootstraping
8. Methods
    a. Method Declarations and Definitions
    b. Pointer Receiver
    c. Type Composition
    d. Encapsulation
9. Interfaces
    a. Interfaces as Types
    b. Interfaces as Contracts
    c. Contracts Fulfillment
    d. Type Assertions
    e. Type Switches
10. Basic Elements of Computing, Performance, and Scalability
    a. Processing
    b. Memory
    c. Storage
    d. Networking
11. Concurrency and Concurrency Patterns
    a. Goroutines
    b. Race Conditions and Detection
    c. Locking Shared Resources
    d. Mutual Exclusion

    e. Memory Synchronization
    f. Goroutines and Threads
    g. Channels
        i. Unbuffered Channels
        ii. Buffered Channels
    h. Multiplexing
    i. Concurrency Patterns
        i. Runner
        ii. Pooling
        iii. Work
12. Unit Testing
    a. Tool
    b. Functions
    c. Profiling
13. Capability Extension
    a. Libraries
    b. Accessing C Code