

Absolutely! Here is the completed list of coding questions based on the topics discussed:

Types Beyond Structs and Interfaces:

1. Alias and Custom Types:

- Define an alias type for `int` named `Age` and a custom type for representing a `Person` with fields `Name` (string) and `Age` (`Age`).

2. Function Types:

- Create a function type `Operation` that takes two `int` parameters and returns an `int`. Write a function that accepts this `Operation` type and applies it to two integers.
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Advanced Struct Usage:

3. Embedding Types in Structs:

- Define a struct `Rectangle` with fields `Width` and `Height`. Embed this struct into another struct `ColoredRectangle` that also includes a `Color` field of type `string`.

4. Embedding Interfaces in Structs:

- Create an interface `Describable` with a method `Describe` that returns a string. Embed this interface in a struct `Product` that also has fields `Name` and `Price`.

5. Function Fields in Structs:

- Define a struct `Calculator` with a function field `Operation` of type `func(int, int) int`. Write a method `SetOperation` to assign different mathematical operations to this field.
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Interfaces vs. Structs:

6. Using Interfaces:

- Create an interface `Shape` with methods `Area` and `Perimeter`. Implement this interface for two structs: `Circle` and `Square`.

7. Struct for Data Modeling:

- Define a struct `Book` with fields `Title`, `Author`, and `ISBN`. Write a function to display the details of a `Book` instance.

8. Interface for Flexibility:

- Write an interface `Speaker` with a method `Speak`. Create two structs `Human` and `Robot` that implement this interface and write a function that accepts `Speaker` and calls `Speak`.
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Good Practices in Go Development:

9. Error Handling:

- Write a function that takes two integers and returns their division. Implement proper error handling to manage division by zero.

10. Using Context:

- Create a function that simulates a network call with a timeout. Use the `context` package to implement the timeout logic and handle potential context cancellations.
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Expanded Questions for Deeper Exploration:

11. Alias Types and Readability:

- Define an alias type `Temperature` for `float64`. Write a function that converts a `Temperature` from Celsius to Fahrenheit.

12. Function Types for Flexibility:

- Define a function type `StringManipulator` that takes a `string` and returns a `string`. Write a function that applies a list of `StringManipulator` functions to a given string.

13. Embedding Interfaces for Separation of Concerns:

- Create an interface `Logger` with a method `Log` and a struct `Service` that embeds `Logger` and includes a `ServiceName` field. Demonstrate how you can mock the `Logger` interface for testing.

14. Function Fields and Dynamic Behavior:

- Write a struct `Task` with a function field `Action` of type `func()`. Create methods to set different actions like `PrintHello` and `PrintGoodbye` to `Action` and execute them.

15. Using Structs for API Design:

- Define a struct `HTTPRequest` with fields `Method`, `URL`, and `Headers`. Write a function to construct and print a basic HTTP request.

16. Interfaces and Polymorphism:

- Create an interface `Transport` with a method `Move`. Implement this interface for two structs `Car` and `Bike`. Write a function that takes `Transport` and calls `Move`.

17. Handling Errors Gracefully:

- Write a function `OpenFile` that takes a filename and opens the file. Implement error handling to manage file not found or permission issues.

18. Managing Context in Concurrency:

- Write a function that launches a goroutine to perform a long-running task. Use `context` to manage the task's cancellation and demonstrate how to handle a context timeout.

19. Profiling and Benchmarking:

- Create a simple function that performs a computationally intensive task. Write a benchmark test to measure its performance and suggest optimizations based on the profiling results.

20. Code Review and Continuous Integration:

- Write a Go function that reads from a file and processes the content. Outline a checklist for a code review focusing on readability, error handling, and performance. Demonstrate how this function could be integrated and tested using a continuous integration system.

This list provides a range of coding challenges that cover fundamental and advanced aspects of Go programming, offering a solid base for both beginners and more experienced developers.