Go Advanced Assignment

Due Date: 21st April 2022(Thurs), 2359

1. Objective

This assignment is to test your understanding and ability to apply the key concepts learnt in Go Advanced course, namely Data Structures, Algorithms, Error handling & Panic System, and Concurrency.

2. Introduction

You are required to develop a simple prototype of an application in Go programming language.

3. Basic Requirements

Your application must:

- Construct and make use of **TWO** different specialized data structures, together with its related operations, for organization and processing of data during program execution.
- Implement and apply appropriate algorithms (e.g. Search, Sort, Recursion) in the processing of the data.
- incorporate error handling mechanism and tolerance to potential panics.
- Make use of channels to facilitate communication between different goroutines and handling of concurrency issues (either via channels, mutex or atomic functions)

The specialized data structures are to be from the following:
- Array – based List
- Pointer –based List (Linked List)
- Stacks (can be array based or pointer based)
- Queues (can be array based or pointer based)
- Binary Search Trees

Suggested application examples:

Venue booking system

Features
- Browse venues
- Search for available venues based on various criteria, e.g. date and time, capacity, type (for e.g. hall/room)
- Book venue
- Edit booking
- Remove booking

Admin features
- Add venue with information
- List bookings of selected venue (like based on what criteria etc)

Dental Appointment system

Features:

- Make appointment
- List available times of selected doctor
- Search for available doctors
- Edit appointment

Admin features

- Browse appointments for a doctor
- Search museum exhibitions/programs

The data structures and algorithms chosen should be appropriate for your application. You will need to justify how they are suitable for the features of your application.

The application is required to have at least insert, update, delete and search functionality. A text driven user interface is adequate for the application, however, it should be user friendly.

Note : You are **NOT** to make use of the in-built data structures and its functions from Go library for the implementation of your data structures and operations.

4. Additional Features (bonus)

In addition to the basic requirements, outlined, the complexity, comprehensiveness and user friendliness of the application will determine how well you score in this section.

Examples of additional features:

- Graphical User Interface (with windows, and GUI elements such as buttons, text fields etc)
- Additional specialized data structures (other than the TWO implemented)
- Advanced specialized data structures (such as composite/ modified data structures, other data structures e.g. double-ended queues, doubly linked lists, self-organizing lists, quad trees, ternary trees, graphs etc)
- Advanced algorithms (advanced search techniques, approximation algorithms & heuristics, randomized algorithms)

5. Deliverables

Assignment Submission

By **Thursday 21st April 2022, 2359** you are required to upload file called **FullName_GoAdvancedSubmission.zip** through the Assignment Submission link in GoSchool. The zip file should contain

- A **short write-up** in Microsoft word document format that clearly indicates info on:
  - Description of features of the application
  - Description of how data structures are being applied and their suitability.
  - Description of the data and format in the various files.
  - Description of various error handling and concurrency mechanism incorporated
  - Instructions on how to run your application

- All the necessary **files needed to run your application**.

- All work submitted should be original.