Assignment 4

You are required to create a database-driven application for a company that offers holidays at a range of campsites. The company will use this system to track and manage accommodation types and units offered at different campsites. This system will allow storage and retrieval of details about campsites, along with storage of details about accommodation type and accommodation units at each campsite. It will also allow the list of accommodation types to be searched by daily rate. This system will record campsite, accommodation type, and accommodation unit details. Specifically, the following data is to be recorded:

Campsite

- Campsite ID
- Name
- Country
- Region
- Telephone
- Email address
- URL

Accommodation Type

- Accommodation Type
- Daily Rate
- No. of occupants
- No. of bedrooms
- Square Meters

Accommodation Unit

- Unit ID
- Campsite ID
- Accommodation Type
- Pitch No.
- Status

An accommodation type can be one of the following:

- Mobile Home
- Tent
- Chalet

A **mobile home** will have all of the attributes listed above under Accommodation Type but in addition, will have the following attributes:

- No. of bathrooms
- Decking (y/n)
- Dishwasher (y/n)

Similarly, a **tent** will have all of the attributes listed under Accommodation Type, but in addition will have the following attributes:

- Grill and gas hob (y/n)
- Covered terrace (y/n)

A **chalet** will also have all of the attributes listed under Accommodation Type, but in addition will have the following attributes:

- No. of stories
- No. of bathrooms
- Adjacent to beach (y/n)
- Balcony (y/n)

In addition, the database must also record the status of each individual accommodation unit:

- Ready for Summer Season
- Under Construction
- Under Routine Maintenance
- Under Refurbishment
- Retired

The Country attribute for a Campsite should be stored as an enumeration (Country) and should have one of the following values:

- France
- Spain
- Italy
- Portugal
- Greece
- Croatia

An appropriate set of database tables must be created to capture this information.

A class architecture that maps to these tables is also required. The MobileHome, Tent and Chalet classes will be derived from the Accommodation Type class. All classes must have **attributes** corresponding to those in the database tables, a **constructor** that takes parameters for all these attributes and **properties** corresponding to these attributes.

The application will connect directly to the database to record this information. To this end, an interface must be created to define the following functionality:

- Adding data to the database.

This interface should be called **IDatabaseAdd**. It has a single function **Insert()** which returns void and takes no parameters.

An interface must also be created to define a function to update the database. This interface should be called **IDatabaseUpdate**. It has a single function named **Update()** which returns void and takes no parameters.

An interface must also be created to define a function to delete an entry from the database. This interface should be called **IDatabaseDelete**. It has a single function **Delete()** which returns void and takes no parameters.

An interface must also be created to define a function to search for an entry in the database. This interface should be called **IDatabaseSearch**. It has a single function **Search()** which returns void and takes the following parameter: **searchValue**.

All classes will implement **IDatabaseAdd** and **IDatabaseDelete**. The **Accommodation Unit** class will also implement **IDatabaseUpdate**, while the **Accommodation Type** class and **Campsite** class will also implement **IDatabaseSearch**.

The Main() method of the application will offer the user the following options:

1. Add Campsite
2. Add Accommodation Type
3. Add Accommodation Unit
4. Delete Campsite
5. Delete Accommodation Type
6. Delete Accommodation Unit
7. Update Accommodation Unit Status
8. Search Accommodation Types by Daily Rate
9. Search Campsites by Country
10. Exit

The following inputs are required.

- For options 1, 2 and 3, the details required for the database must be inputted.
- For options 4, 5, and 6, the user must input the relevant identifier of the item to be deleted.
- For option 7, the Unit ID must be inputted. The user is then asked to select one of the following statuses:
    - Ready for Summer Season
    - Under Construction
    - Under Routine Maintenance
    - Under Refurbishment
    - Retired
- For option 8, the user must enter the Daily Rate. The search will look for accommodation types whose daily rate is <u>greater than or equal to</u> the value entered by the user. The result of the search will list all of the attributes of the accommodation type table.
- For option 9, the user must enter the Country value. The search will look for campsites located in the country entered by the user. The result of the search will list the following attributes *only* from the campsite table: Name, Region, Email address, URL.

The main menu must redisplay until the user elects to exit the application. The application must also have error and exception handling in case the user omits an input, inputs an invalid data type or selects an invalid menu option.

To Do

Systems Analysis

- Create a **Context Entity Relationship Diagram** for the database.

Systems Design

- Create a **Design Class Diagram** for the class architecture.
- Create a **Design Sequence Diagram** for each function of the application.
- Create a **Logical, Key-Based and Fully Attributed Entity Relationship Diagram** for the database.
- Create a **State Diagram** to model an accommodation unit's status.
- Create a **System Architecture Diagram** for the system components i.e. user interface and database.

Systems Implementation

- Implement the application using the **C# programming language**.
- Implement the database using **MS Access**.

Deliverables:

- Visual Paradigm Project
- Visual Studio Project (in ZIP format)

Notes

- **Due Date: Monday 20/04/2020 at 9am**
- This exercise is worth 10% of your module mark.
- Upload this project to Canvas.
- Late submissions will be subject to penalties as per college regulations and the Head of Department and BIS Course Board will be informed. Submissions that are more than 1 week late will not be corrected.
- You must complete this assignment individually.
- Assignments will be assessed for plagiarism. **If you are found to have plagiarised or otherwise been dishonest in your efforts you will receive 0%.** The Programme Board will be notified of the situation and you will not receive a reference from the college.