CIS 3342 Project 3 –   
Web Services

This project will give you experience working with web services. In this project you are to create an ASPX page that will be a Web Service Client that uses a Web Service. **Important: only the Web Service can access and use the database.**

**Requirements:**

You need to create a Web Application that utilizes a Web Service for the Multiple Listing Service (MLS) used for buying and selling homes. The Web service will be responsible for working with the database, and it will be responsible for adding, removing, updating, and searching for homes. The ASPX page should allow the user to enter certain criteria, and display all the homes from the database that meet this criteria. The ASPX page (Web Service Consumer) shouldn’t contain any database connection code; it should rely on the Web Service to handle all database actions.

**Database Requirements:**

1. A **Homes** table that stores information about each home (address, city, state, listing price, square footage, availability (sold/for sale/foreclosure), # of bedrooms, # of bathrooms, and all other necessary amenities).
2. A table that stores information about a request to see a home or homes.

* You will need to link a realtor to home for a given transaction that involves showing multiple homes and contacting multiple realtors.

1. A table that stores information about the realtors selling a particular house (listing agent).
2. These are some tables, but you need to implement a more complete data model with more tables to allow the required functionality.

**Class Library Requirements:**

1. A **Home** class that represents a home object with the fields/properties/members related to a home.
2. A **Realtor** class that represents a realtor object with the fields/properties/members related to a realtor.
3. A **Client** class that represents a client object with the fields/properties/members related to a client.
4. The remaining classes are based on component-based software design to perform the necessary functionalities.

**Web Service Requirements:**  
Your Web Service will contain at least the following methods:

1. The Web Service needs to contain a method that receives a city, state, and some other criteria, and returns a DataSet that contains all the homes that fit the criteria from the Homes table. For example, the method can be passed the values Philadelphia, PA, and $100,000 as the maximum home value, and it will return all the homes in Philadelphia, PA that are equal to or less than $100,000.
   1. The web service client will use the DataSet returned by this method to display in a GridView or some other method of dynamic data display, which will be used to display the list of homes.
   2. The Web Service should allow the user to search for homes based on budget, size (square footage), and home type (single family / condo / town house). This can be accomplished by a single method or multiple methods.
2. The Web Service needs to contain a method that receives an array of Home objects the user would like to visit and a customer object, and the method will return a confirmation (true/false). This method will be responsible for recording the home showings in the database.
3. The Web Service need methods to add a home, delete a home, and update an existing home in the database.

* You must assign a Realtor to each home that is added to the database. Alternatively, you could mark a home as “for sale by owner.”

1. The Web Service may require other methods to complete other important operations. This is for you to determine.

**Web Application Requirements:**

1. The Web Application needs to allow the user search for homes in a variety of ways. Build a GUI to allow the user to make different types of searches and display the results. This application must make calls to the Web Service Web Methods to do the searches and return the results. The search results (homes) should be displayed using a GridView or any other type of dynamic data display we discussed in class.
2. The Web Application needs to allow a user to add, delete, and update a home in the database. Build a GUI that allows the user to perform these tasks, and use the Web Service Web Methods to perform the actual tasks.
3. The Web application needs to allow a user to make a request to visit some homes they are interested in buying. The GUI should allow the user to make selections from the homes displayed after the search results. The Web application will make a call to a Web Method that takes an array of Home objects, and records the home showing requests in the database.
4. The Web Application needs to allow a Realtor to view a list of home showings related to the homes the realtor is assigned. Build a GUI to accomplish this and use the Web Service to retrieve the records from the database.
5. Make the site professional and attractive:

*You don’t need to use CSS to style your site, but I expect your site to look professional through the use of colors, styles, images, and proper alignments.*

1. Make use of Stored Procedures:

*You must use stored procedures for all database operations.*

1. Use server-side input validation for all transactions where necessary.

**Design principles:**

* 1. This application will be used by a realtor and their assistants. Think of this perspective when designing the application.
  2. Provide a consistent and logical navigation system. The user should never have to use the browser’s Back and Forward buttons to move between pages.
  3. The user should be presented with an opening screen that presents the various transactions with links to respective pages to perform the selected transaction.
  4. Make your presentation clear to the user, providing on-screen instructions wherever needed both for data entry and error correction. If required data is omitted or entries are incorrect, the user should not have to re-enter data that is already correct.
  5. Create a good data model and implement the data model by creating the necessary tables in the database. The tables I listed above are just for explanation purposes. You are free to make a completely different set of tables since I expect you to implement your own data model. You will be graded on the implementation of your data model.
  6. You need to use a proper naming convention for all controls and in your code. I expect you to properly name your classes, variables, functions, etc…
  7. Your programs shouldn’t crash for any reason; it’s poor design to have a program crash. Make sure to implement exception handling in appropriate places that can cause errors and handle them gracefully.
  8. Perform server-side input validation where necessary.
  9. **You must use component-based software design. This means writing as much code in classes and functions of classes instead of in the GUI.**

**Approach to Project 3**

1. Implement the Web Service (ASMX)  
   Reference your personal ClassLibrary that will contain the classes for this project and the Utilities class library for the DBConnect class in the Web Service project. Make sure you have appropriate class definitions for all the classes needed by the Web Service.
2. Create a HomeListingSvcPxy Web Reference by performing the “Discovery” process on the web service client. The Web Reference should be to a Web Service in a Solution until your program is ready to deploy. When you are ready to deploy the project to the Web, right before project submission, you need recreate the Web Reference to use the published Web service.
   * After this step, you will be able to create a web service proxy object to use the web service.

(3) Implement your client web application (ASPX)

**\*\*\* If you try to import the Libraries or classes on the web service client (project where the ASPX pages exists) and use the classes to retrieve data from the Web Service, you will get an error message that says that the class definitions from the service side cannot be converted to the class definitions used on the web service client side.** **This error is because you must use the web service’s version of all user-defined types (complex types).**

**Due:**  
See project posting under the Assignments section of Blackboard.

**Submission:**You need to publish your web application project to the cis-iis2 web server in your account’s Project4 folder, publish the web service to your accounts Project4WS folder, upload your source code to Blackboard, and provide the URL to your web application’s start page (Table of Contents page) along with a list of cities that have homes. Make sure a current version of your solution is also located in your G:\cis3342 folder.

**Important…**

In addition to normal submission process described above, you need to provide a reasonable number of records to allow us to run and test your application. Before submitting the project, you must populate your tables with a minimum of 3 cities each with a minimum of 20 houses with varying values that can be used to test all the searches. You must include the cities with the URL to your project when submitting the project.

Projects that are not submitted properly will not be graded.   
  
You need to zip the root folder for your Visual Studio Solution into a single zip file and submit the assignment in Blackboard. To submit the assignment, you need to click the Assignment’s Title “Project 4” to view the submission form and upload the file.

**Make sure you properly submit your assignment and that it works. Programs that don’t run or don’t contain all the necessary files will not be graded.**