Course: ENSF 608 – Fall 2022
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Final Project: Real Estate Search Engine Database
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Project Proposal

Title of Project – Real Estate Search Engine Database

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Project Abstract

Real estate search engines serve as an efficient market place for the exchange of property with websites such as realtor.ca, remax.com, and zillow.com being commonplace in today's world. This convenience, which we often take for granted, would not be possible without a well designed and robust database in the background. The main features of such applications are for real estate agents to list new properties for sale, for buyers to browse these properties and save them to their favourites list, and finally for the buyer and seller to set up an appointment for the viewing of a property.

Project Scenario and Goals

After registering on our real estate search engine website, regular users are able to browse available listings, add/remove listings to/from their favourites list for later browsing, and set up appointments with the real estate agents in order to view the property. Real estate agents are specialized users which are also able to list new properties for sale in addition to being able to do everything that a regular user can. Real estate agents should also be able to remove a listing as this would be required once the property is sold or if the owner decides that they are no longer interested in selling their property.

Each listed property has a wide array of associated information that can help buyers make an informed choice. This includes, but is not limited to, attributes such as the listing price, the property type, the address, and the size of the property.

Because location is key when purchasing a property, searching by location should be as granular as possible. This is why each property is assigned to a neighbourhood, each of which have their own set of attributes such as WalkScore, BikeScore, and various available amenities. This allows users to conveniently filter to only the specific parts of town that they are interested in. In addition, a user should be able to easily see how many properties are currently listed for a given neigbourhood to gauge availability in that area.

Since the real estate market is very dynamic, listing prices are often changed after the initial listing. Real estate agents should be able to update the price of their listings. Additionally, end users should be able view the price history for any property as this may be an important factor in guiding their decisions.

At the early stages of this pilot, the size of the project will be relatively small. The focus should be on reliability and robustness. It is expected that speed will not be an issue given the relatively small amount of data. To ensure that a growing user base can be handled once the website is deployed, scalability of both data storage and speed should be taken into consideration. Correctly designing the initial database is important in meeting these criteria.

Design Strategy

Design considerations for our database begin with the end-user in mind. The end-user will initially have to create an account on the real estate search engine website. The user's information, such as email, password, name, and phone number will have to be stored in a table. It is assumed that every individual has a unique email address, and this will therefore be used as the primary key.

When creating an account, a user may also specify that they are a real estate agent. This will be a specialization of the general user. Real estate agents will have some additional information associated with them, such as the company they represent, their rating, and any secondary languages that they may speak. Real estate agents will have the added functionality of being able to list new properties for sale.

Every property listing has a unique identifier (MLS Number) which will be used as the primary key. In addition to its basic attributes, a property must be located in a specific neighbourhood. Since each property must be located in only one neighbourhood, reference to the neighbourhood will be added as a foreign key. Neighbourhoods will contain amenities, but since many neighbourhoods can contain the same type of amenity, this multivalued attribute will effectively be modelled as a many-to-many relationship.

The real estate agent should be able to change the price of a listing. A record log of these changes will need to be saved and stored since it will also need to be displayed to the general users. The price of a listing may change multiple times. Since these prices are changed relatively infrequently and are tied to a specific property, price history will be modelled as a weak entity with the date as the partial key. This implies that the price of a listing can only be changed once each day.

Buyers should be able to set up viewing appointments with the real estate agents. This will be modelled as a ternary relationship between the buyer, real estate agent, and the property. The primary key will include all of these foreign keys, as well as the appointment time. This ensures that appointments can be set up to view the same house multiple times.

Design Unknowns/Risk

An unknown factor in a project such as this is whether it will ultimately become popular. The initial set up may be relatively simple and only able to support a handful of users. However, in the event that the user base grows rapidly, the design will need to be scalable so that it can handle many requests from many users at the same time.

In terms of development, building the front end is new to all group members. This part of the design involves HTML, CSS, and JS, the learning of which will require some upfront time commitment.

Implementation Plan and Schedule

Nov 18, 2022: Create an ERR diagram to understand the database architecture

Nov 20, 2022: Create a Relational schema to understand the relationship between the data

Nov 22, 2022: Create A single .sql file to build and populate the database

Nov 25, 2022: Test the database and create a single .sql file to demonstrate functionality

Nov 27, 2022: Put together documentation and record a demonstration video

Dec 2, 2022: Final submission of project

Evaluation

Success will be evaluated by whether all of the project criteria are met and will be demonstrated through a video demonstration. The final report will display all necessary diagrams to describe how the final project came together.

The goal is to have a design that is as simple as possible, but still meets all the requirements. The largest trade off will be that if the design is too simple, it may be difficult to add additional functionality without overhauling the schema, which is always best to avoid. On the other hand, if the database is over-designed and too many features are added, it may negatively impact the overall performance of the project, and many of the features may not be used.