Database Management Systems Project - Phase 1
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APPLICATION

Online Property Trends Application

PURPOSE OF THE SYSTEM

The proposed system will allow the user to analyze the trend of property rates over a period of time and will provide the end user with an estimate for his/her property based on historical trends. The system will also show the property trends in the form of visualizations so that the user can have a better understanding of the facts and figures. Further, the application will assist the user by providing smart suggestions, which can further increase the property rate.

To perform the analysis of property prices, the system will store and use the prices of properties in different regions, spread over a period of years. It takes into account different features like “number of bedrooms”, ”year of construction”, ”location”, “current condition”, “last renovation date” and many more for the aforementioned purpose. The variations in property prices due to different conditions of properties, is used by the system to provide suggestions to user, to further improve his property value. The system provides a clear and concise view of the analyzed trends to the user in the form of charts and graphs, making it easier for the user to understand the current market progression and eventually obtain a better value for their property.

MOTIVATION FOR THE TOPIC

We want to implement a system, which will consolidate heterogeneous data regarding property prices, and allow a user to view and benefit from the historical trends. We also want to represent this data in a clear and concise manner, to allow the user to easily understand the price variations. For this purpose, we will be using a number of visualizations to represent our analysis of the datasets.

Also, we want to provide the user with a platform wherein they can specify all the features of the property, using which the system can provide an approximate rate for it. The system will take into consideration all the property features along with the historical and current trends in property rates in that region to provide with an approximate value. Traditionally, the user would have to approach real estate agencies to get this information, wherein they would have to incur a significant cost. Our system will eliminate this by providing all this information at a single click of a button.

ADVANTAGES OF THE SYSTEM

- **Convenience**:
  Being an online based application system, it is accessible even through mobile devices on the go. This will save the end user's time and resources by providing their property's estimated value at the click of a button.
- **Consolidated**:
  The user will get access to a vast variegated real-estate dataset consolidated from various sources over a long period of time.
- **Smart System:**
  The application will perform various data analytics on the historical data to provide the best possible pricing trends based on certain specifications.
- **Intuitive:**
  The system will be user-friendly requiring little or no technical knowledge to benefit from all the features of the application.

SOFTWARE REQUIREMENTS

- **Database:** Oracle 11g
- **Front End:** Bootstrap, HTML5, CSS3, and AngularJS
- **Back End:** Spring Boot
- **Technologies:** Java and Spring Framework
- **Tools/IDE:** SQL Developer, Eclipse, Spring Tool Suite

APPLICATION FUNCTIONALITIES

User Functionalities:

- **Sign Up/Sign in:** The application will allow the user to create login credentials and use them to access the portal.
- **Sale Information**: The user can choose to provide information on their sale of property, which will further improve our system's estimation capabilities.
- **Get Price Estimate:** The user will input a set of property specifications based on which the system will provide an approximate value of their property.
- **Visualizations:** The user will be able to easily view all the historical trends at various levels of granularity.
- **Suggestions:** The application will smartly prompt suggestions to the user, giving him ideas as to how he can increase the property value, by upgrading certain features of the property.

SYSTEM WORKING

Once the user has successfully signed up and logged into the system, he will be introduced with a short summary of the listings and prices of various popular regions. He can then input various features of his property such as, number of bedrooms, bathrooms, floors, along-with sq. ft. living area, location, year built, etc. Based on this input, the system will smartly query the database, create a self-learning model, trained using certain machine learning algorithms on the queried data and give a projection of the property rate. Before the user finalizes on the buying/selling price of the property, he can visualize various trends based on the past data in the form of line charts, histograms, pie charts, etc. Once provided with an estimated projection, the user will also be presented with several suggestions in the form of property improvements, to boost his property value. The application also has the provision, where in the user can share his experiences about a property deal, helping the other buyers/sellers with recent transactions, happening in real estate industry.

DATABASE QUERIES

- Extract the average property value of a region(s) over past few years
- List the most recent properties sold in an area along with its features and specifications
- Calculate the mean, median, minimum and maximum value of property based on particular set of features across all the regions
- Extract the dataset based on the features provided by user, which is required for extrapolating the price estimate for a future date
- Which region consists of the costliest/cheapest properties?
- Displaying the variability/range of prices for the different regions.
- Which properties fall within a certain price range in a region?
- Enumerate properties based on their cost over the past few days.
- Displaying the percentage change in house prices across all the years
- Updating our housing data records from user experiences.
- Listing the number of houses sold in the specific months of the year for a particular region. For example, the number of houses sold in Seattle region is more during the summer months and less during the winters.