Advanced Feature: Data Analytics

MainePad Finder

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Within the *MainePad Finder* project, I implemented several SQL queries, triggers, and Python scripts that endeavored to chronicle the changing of prices over time as a means of providing advanced data analytics features. These implements include:

- `PROP_PRICE_HISTORY.sql`
- `ADD_PROP_PRICE_HISTORY.sql`
- `prop_price_trending()` (within `app.py`)

Some optimizing decisions made in the creation of these scripts are described within this project's *Performance Analysis and Optimization Report.*

The central script made for this implementation was `PROP_PRICE_HISTORY.sql`, an SQL schema that, upon creation, would provide an environment for hosting changes in property prices over time. Parameters defined within this schema include the property ID to which each price listing over time respectively pertains; a timestamp (defined, by default, as the exact time in which an `INSERT` query is performed upon the schema); and the cost of rent for the identified property at that exact time.

`ADD_PROP_PRICE_HISTORY.sql` provides a trigger that, upon implementation, adds a new listing to the aforementioned schema whenever a property's *price* explicitly is altered. In doing this, and mandating that the trigger be activated upon *every* such update, this simple infrastructure could permit users to vividly observe how a property's price has fluctuated over time, and whether it has tended to recently trend up or down in price. This is of pertinence to the usability and broader appeal of the *MainePad Finder*

application, because the consideration of cost-efficacy within a rental property – widely reflected as being of the utmost importance to prospective renters within our initial stakeholder interviews – is a characteristic reflected not just by a rental property's *current* price, but the manner in which that property's price has vacillated over extended periods of time.

`prop_price_trending()` is a simple Python function included within `app.py` that provides a simple demonstration of how this infrastructure could be used to effectively analyze a property's price over time and determine in what direction its price is trending. It provides the most basic analysis possible of the data included within the `PROP_PRICE_HISTORY` schema, and is only included for demonstration purposes: if the most recent two entries for a selected property demonstrate an *increase* in price, then that property is said to be trending *up* in rental price; if a *decrease* is detected, that property is said to be trending *down* in rental price; and if fewer than two data points for a property are detected, that property then has insufficient data to deduce if its price is trending up or down. Future adaptations upon this infrastructure could see more complex inquiries be made, based still on the initially-defined `PROP_PRICE_HISTORY` schema and its `ADD_PROP_PRICE_HISTORY` trigger.

These implements were unable to be implemented in any manner discernable to the user on the *MainePad Finder* application's frontend. An easy application of these features would likely be perceivable within the app's `Properties` and `Listing` pages, where each listed property could include, in addition to its basic information, some information on the direction that each property's rental price is observed to be trending towards over time.