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CIS 550/450 PROJECT MILESTONE 2

Motivation for the idea

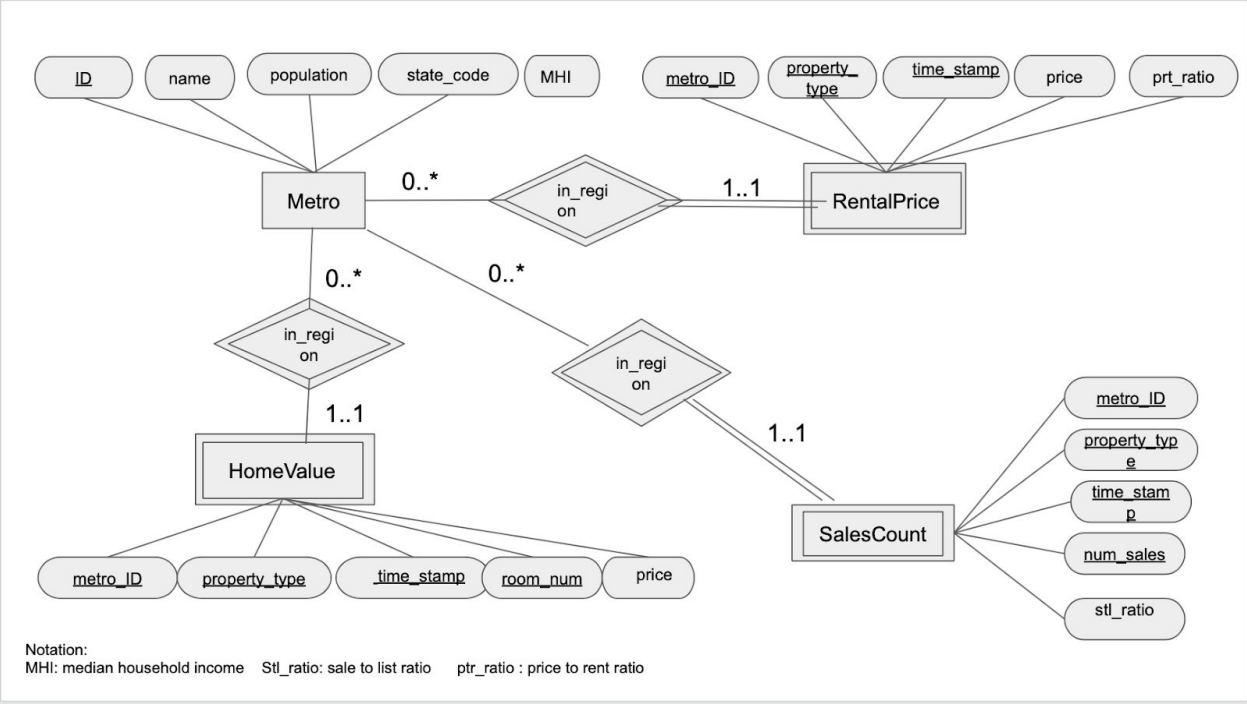
Our project is interested in exploring the datasets of U.S. home's sale prices and rental prices. We will look at historical listing/sale prices of all types of homes across U.S. and try to find any underlying trend. The same thing will be implemented to the rental price database. To interact with both databases, we will try to compare the trends from both databases. By comparing those databases, we hope to find relationship between house pricing and rental prices etc.

Description of the complementary sources you intend to use for data, and how you intend to ingest the data into your database

We will add the population and median household income data of the metros, in order to find out the relations between house sales and rental values and these properties of metros.

Relational schema

ER diagram:



SQL DDL:

```
DECLARE @Property_types TABLE (Value VARCHAR(255));
INSERT INTO @Property_types VALUES("single family home");
INSERT INTO @Property_types VALUES("condo/co-op");

DECLARE @Room_nums TABLE (Value INT);
INSERT INTO @Room_nums VALUES(1);
INSERT INTO @Room_nums VALUES(2);
INSERT INTO @Room_nums VALUES(3);
INSERT INTO @Room_nums VALUES(4);
INSERT INTO @Room_nums VALUES(5);

CREATE TABLE Metro(
    ID INT NOT NULL,
    name VARCHAR(255),
    population INT,
    state_code CHAR(2),
    MHI FLOAT, -- Median House Income
    PRIMARY KEY(ID)
);

CREATE TABLE HomeValue(
    metro_ID INT NOT NULL,
    property_type VARCHAR(255) NOT NULL,
    time_stamp DATE NOT NULL,
    room_num INT NOT NULL,
    price INT,
    PRIMARY KEY(metro_ID, property_type, time_stamp, room_num),
    FOREIGN KEY(metro_ID) REFERENCES Metro(ID),
    CONSTRAINT HomeValueCheck CHECK( property_type IN (SELECT * FROM @Property_types) AND room_num IN (SELECT * FROM @Room_nums) )
);
```

```
CREATE TABLE RentalPrice(
    metro_ID INT NOT NULL,
    property_type VARCHAR(255) NOT NULL,
    time_stamp DATE NOT NULL,
    price INT,
    prt_ratio FLOAT, -- Price-to-Rent Ratio
    PRIMARY KEY(metro_ID, property_type, time_stamp),
    FOREIGN KEY(metro_ID) REFERENCES Metro(ID),
    CHECK( property_type IN (SELECT * FROM @Property_types) )
);

CREATE TABLE SalesCount(
    metro_ID INT NOT NULL,
    property_type VARCHAR(255) NOT NULL,
    time_stamp DATE NOT NULL,
    num_sales INT,
    stl_ratio FLOAT, -- Sale-to-List Ratio
    PRIMARY KEY(metro_ID, property_type, time_stamp),
    FOREIGN KEY(metro_ID) REFERENCES Metro(ID),
    CHECK( property_type IN (SELECT * FROM @Property_types) )
);
```

Features that will definitely be implemented in the application

- Comparison between sales value and rental value across metros, with respect to time stamps.
- Visualization of house pricing/sale pricing trend among years. (with graphs)
- Comparison between housing and rental prices of different property types
- Relation between rental price and price to rent ratio, and the relation between sales count and sale to list ratio.

Features that might be implemented in the application, given enough time

- More explorations within one database such as a comparison between room number and home value

- Interact with map API to improve the visualization in a straightforward way

Technologies to be used:

HTML, css, javascript, MEAN stack, SQL

Bonus: (AWS google map API or NoSQL)

Member responsibility:

Each member is responsible for the implementation for a single page. Our web application will be consisted of 5 tabs: a home page, a housing price analysis page, a rental price analysis page, a sales count analysis page and a comparison page. The detailed split of responsibilities is given as follows:

Wanci Yuan is responsible for the home page, as well as populating and maintaining the database; Zhiyuan Li is responsible for the housing price analysis page; Shuqi Zhang is responsible for the rental price analysis page; Zhengyuan Xu is responsible for the sales count analysis page; The comparison page, which is expected to be the hardest to implement, will be a shared task among the four members of our group.