CODING DOJO

SDA
الأكاديمية السعودية الرقمية
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REPORT

REAL ESTATE IN SAUDI ARABIA

Introduction:

For many people, buying a house is the largest purchase they will ever make. It can take anywhere from a few months to several years to save up a down payment, and most mortgages are financed for 15 to 30 years. Even seasoned real estate investors have to spend time securing funding before buying a property.

"It's a supply and demand issue. We're in a spot today where demand is very high and supply is very low, which drives prices even higher."

What increases the extent of suffering and the prolongs the period of obtaining a house for the citizen is the high rent costs, as the citizen is forced to save large amounts of his salary in order to pay the rent costs. As the recent rise in rent prices has reached such an extent that the citizen can no longer balance between his personal and family needs and paying the rent.

2030 Vision Role:

The 2030 Kingdom Vision is one of the giant projects that will have a significant impact in all aspects of life in the Kingdom of Saudi Arabia, and in particular in the economic aspect.

And one of the important economic areas that will have a clear impact is the field of real estate, so whoever looks at the vision document , clearly sees its direct and indirect impact on the real estate sector, the huge projects such as NEOM, Qiddiya and Theline will increase the real estate area in the Kingdom and thus increase the area of housing , work and jobs.

And out of 2030 vision interest in the real estate field, the General Real Estate Authority was established to be the central regulatory authority for the real estate sector.

The program also launched the service of documenting rental contracts, "Ejar platform" to regulate the real estate rental sector in the Kingdom of Saudi Arabia in a balanced manner that preserves the rights for the parties of the rental process.

Project Objective:

The objective of this analysis is to help us understanding the reason in increasing in real estate of Saudi Arabia and how these factors are used to predict the housing price:

The selected cities are Riyadh, Jeddah, Dammam, and Al-Khobar.

- Riyadh is the capital and largest city in Saudi Arabia, with the largest municipal population in the Middle East. Riyadh has a diverse range of people and cultures; it is still growing day by day.
- Jeddah which located in the middle of the eastern coast of the red sea and is considered the economic and tourism capital of the country.
- Dammam it lies on the Persian Gulf northwest of Bahrain Island and forms a larger metropolitan and industrial complex with Khobar, Qatif, and Dhahran.
- Al-Khobar city is one of the three main cities in the Eastern Province, the others being Dammam and Dhahran. It is developing into an important industrial city, with factories turning out industrial gas, dairy products, carbonated water, tissue paper and ready-made garments.

Data Review:

Saudi Arabia Real Estate (AQAR) is the dataset used in this project has taken from Kaggle. The dataset is collected and scrapped from "Aqar website".

The dataset contains 3718 records and 24 columns about the price of rental houses and it's features in Riyadh, Jeddah, Dammam, and Alkhobar.

Dataset link:

https://www.kaggle.com/lama122/saudi-arabia-real-estate-aqar

Variables and Exploration:

Variable	Meaning
city	city where house locate in
district	district where house locate in
front	What is the house front is north, west .. etc
size	size in m^2
propertyage	property age for the house
bedrooms	number of bedrooms
bathrooms	number of bathrooms
livingrooms	number of livingrooms
kitchen	show whether the house have a kitchen or not
garage	show whether the house have a garage or not
driverroom	show whether the house have a driverroom or not
maidroom	show whether the house have a maid_room or not
furnished	show whether the house is furnished or not
ac	show whether the house have a ac or not
roof	show whether the house have a space for roof on top or not
pool	show whether the house have a pool or not
frontyard	show whether the house have a frontyard or not
basement	show whether the house have a basement or not
duplex	show whether the house is a duplex or not
stairs	show whether the house have a stairs or not
elevator	show whether the house have an elevator or not
fireplace	show whether the house have a fireplace or not
price	show the price of the house
details	shows any additional details from the house owner about the house

Data Preprocessing:

The data was translated from Arabic into English in the Excel program, and the details column was deleted because it contained unimportant data for our project

Data Exploration:

In order to better understand the data, we made a set of graphs and deduced several useful insights from the data that we can summarize as follows:
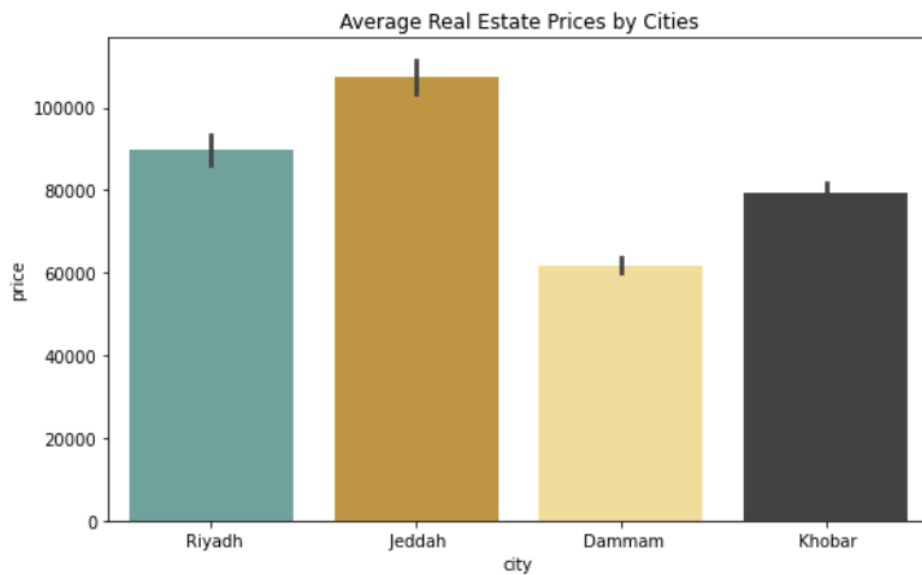
This graph shows the average price of real estate for the cities, it's shows that the highest average house rent price is in Jeddah with 112,881 SR, and the lowest average price for renting a house is in Dammam with 63,283 SR.

This plot shows that the property age is slightly affects the price, as some modern rent houses show an increase in prices of up to 450,000 SR compared to the old houses where the highest price reaches about 200,000 SR.

price per the size

This graph shows that the price is significantly affected by the size of the property, as the greater the size of the property, the higher its price, most of small properties their prices does not exceed 250,000 SR.
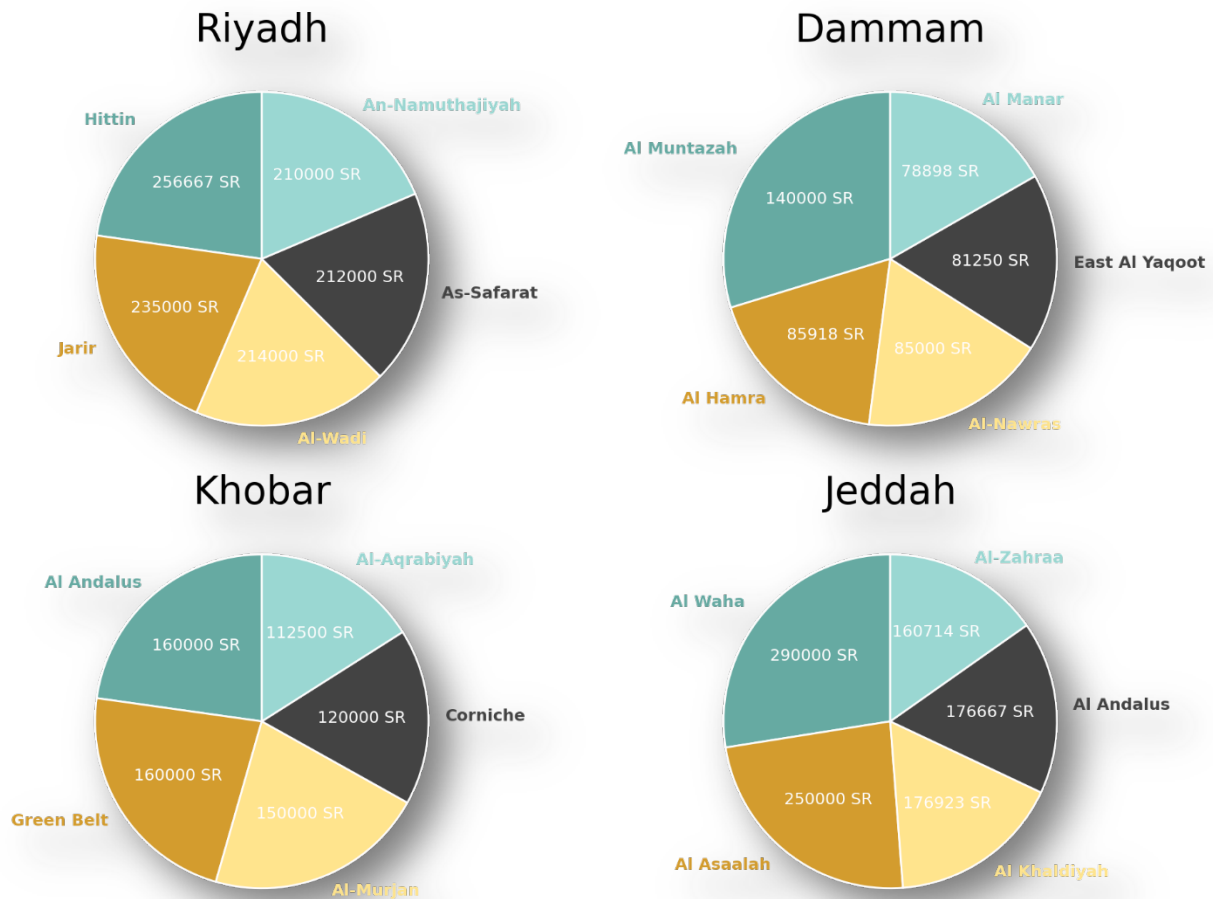
Do not forget that there are other factors that affect the price of the property, such as whether the property has a front yard, swimming pool, garage, elevator, also whether it is equipped with air conditioners and furniture ... etc.
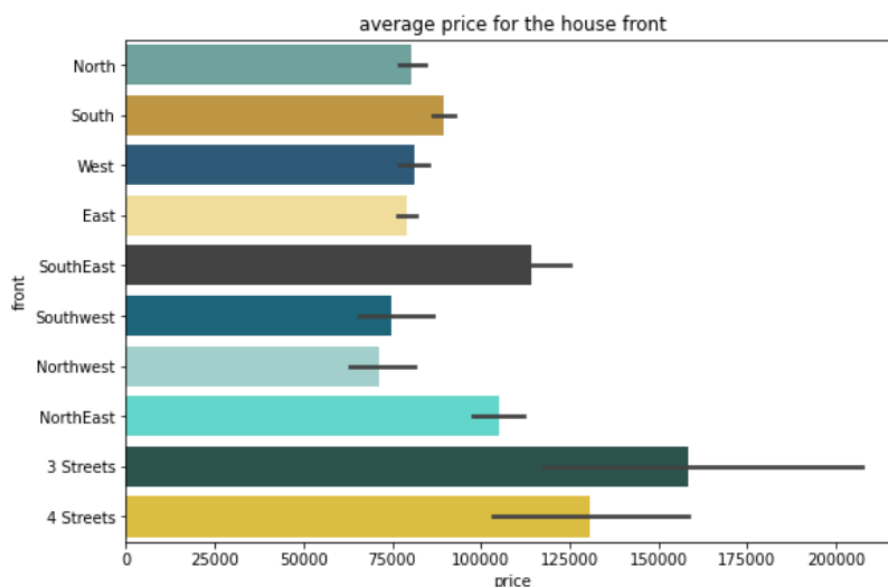
average price for the house front

This plot shows the average price of houses in relation to the front of the house, the houses that land between 3 streets got the highest average price with 259,347 SR, and the northwestern front houses got the lowest average price with 71,277 SR.

Riyadh

- An-Namuthajiyah — 210000 SR
- As-Safarat — 212000 SR
- Al-Wadi — 214000 SR
- Jarir — 235000 SR
- Hittin — 256667 SR

Dammam

- Al Manar — 78898 SR
- East Al Yaqoot — 81250 SR
- Al-Nawras — 85000 SR
- Al Hamra — 85918 SR
- Al Muntazah — 140000 SR

Khobar

- Al-Aqrabiyah — 112500 SR
- Corniche — 120000 SR
- Al-Murjan — 150000 SR
- Green Belt — 160000 SR
- Al Andalus — 160000 SR

Jeddah

- Al-Zahraa — 160714 SR
- Al Andalus — 176667 SR
- Al Khaldiyah — 176923 SR
- Al Asaalah — 250000 SR
- Al Waha — 290000 SR

The plot shows the 5 most expensive district by the main cities in saudi arabia, hittin got the highest average price with 256667 in riyadh, while jarir the 2nd highest average price with 235000, and An Namudhajiyah the last highest average price with 214000.

al muntazah got the highest average price with 140000 in dammam, and al hammra got 2nd highest average price with 85918, last highest average price with 78898 for al manar.

in jeddah the highest average price district is 290000 for al waha, while al asaalah got the 2nd highest average price with 250000, and last highest average price with 176667 for al andalus.

for khobar al andalus and the green belt district got the highest average price with 160000, while al murjan got the 2nd highest average price with 150000, and last highest average price with 120000 for corniche.
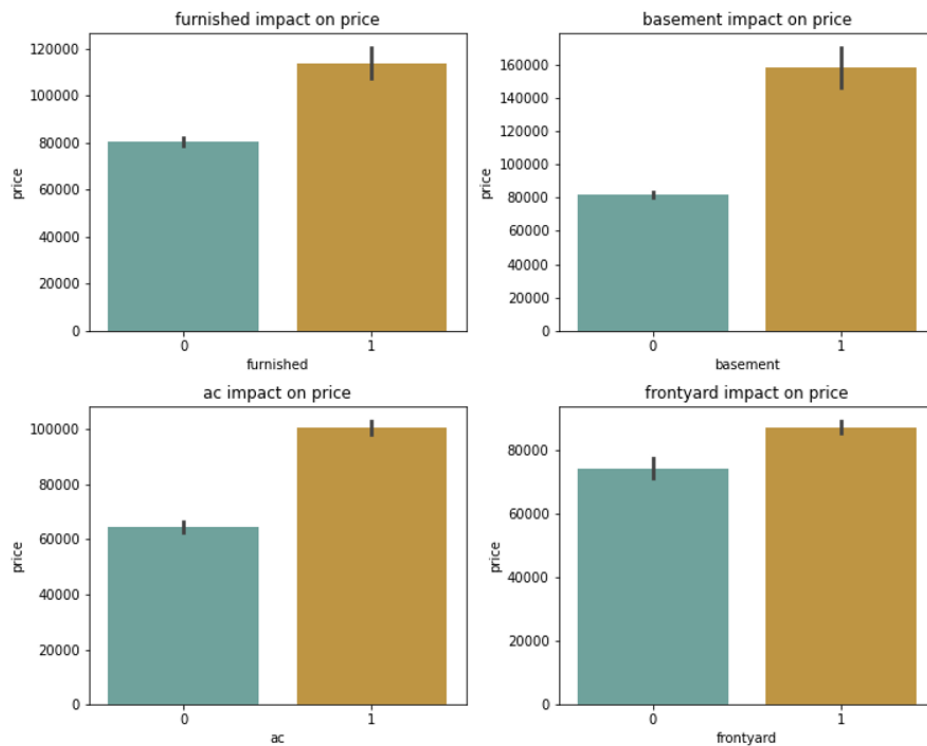
This subplot shows the effect of some criteria on the price, such as whether the house is furnished or not, or if it has air conditioners, basement, or front yard.

All of these factors affect the prices of homes, as many people prefer to rent a house where these factors are available. The cost of air conditioners and furniture, for example, puts a great deal of weight on the tenant if they are not available in the house, as their prices are very expensive, not to mention the burdens and costs of moving them after the expiry of the contract period and the desire to moving to another house, that is why real estate owners put an increase in the price if these factors are available in the house.

ML Regression Model:

For this project we tried to build a model to predict the rental houses prices, and to Build this model we went through several type of ML regression model which is linear regression, decision tree, random forest, XGBoost, and support vector regression to get the best accurate predict for the approximate rental price, and this process went through three stages, first we tested the models without any development to see their performance, then we tried to remove the outlier which is improve the models resulting but it's not the desire result yet, so we used GridSearchCV for many of them to tune the parameters of the models.

after the comparison we set with the random forest regression which give us the best results about 0.7 accuracy and 9910 mean absolute error, and to make sure of the model accuracy we calculated the percentage prediction error between the actual price and predict price and made a table to count the 20%, 40% and 80% error difference of the actual price.

Percentage Prediction Error	20% Difference	40% Difference	80% Difference
Count	149	82	24

as the table shows the model predict 80% error 24 times which is the less number between the other error percentage, which is good, for 40% 82 times and for 20% 149 times.

then we made another table to see the model prediction performance by count how many time the predicted price was more than the actual price and how many time it's less than the actual price or it's equal the actual price.

Prediction Performance	Predicted > Actual	Predicted < Actual	Predicted = Actual
Count	162	132	440

We found that the time were the predicted price was equal to the actual price got the highest number which is 440 out of 734, and the number of time were the predicted price was less than the actual price it's 132, and for predicted price more than actual price it's 162, and this result is good if someone want to rely on our model prediction, because the time were the prediction was equal or higher than the actual price were more than the time were the prediction was less than the actual price, So the loanee will be in the safe side.

Some Plots with Actual and Predicted Price:

after removing the outliers, some graphs have been redrawn to measure the extent of differences and similarities between the price in the basic data and the predicted price using our model.

Average Real Estate Prices by Cities (actual price)

Average Real Estate Prices by Cities (predicted price)

price per the size (actual price)

price per the size (predicted price)