House_Price_Prediction

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Abstract:

Machine learning plays a major role from past years in image detection, spam reorganization, normal speech command, product recommendation. Present machine learning algorithm helps us in enhancing security alerts, ensuring public safety. Machine learning system also provides better customer service and safer automobile systems. In the present paper we discuss about the prediction of future housing prices that is generated by machine learning algorithm. For the selection of prediction methods and explore various prediction methods.

We in that point recommend a housing cost prediction model to support a house vender or a real estate agent for better information based on the valuation of house. Those examinations exhibit that linear regression algorithm, in view of accuracy, reliably outperforms

alternate models in the execution of housing cost prediction.

Problem Statement:

Housing prices are an important reflection of the economy, and housing price ranges are of great interest for both buyers and seller .Providing a methodology approach to analyze the price prediction method to get insights about the determining factors.

Market/Customer Need Assessment:

Rising house prices, generally encourage consumer spending and lead to higher economic growth – due to the wealth effect. A sharp drop in house prices adversely affects consumer confidence, construction and leads to lower economic growth.

Firstly, we need to be aware of the most common customer needs. People need to trust that the product they’re getting will last. They need to rely on its ability to function properly for a reasonable amount of time. Another aspect that is essential for many customers nowadays is sustainability. Big companies ,nailing the needs of their customers .People need to know exactly what they’re paying up front and without hidden price. If you feel like you need to hide information from your customers, this is a big red flag.

How do changes in the value of homes affect consumer spending?

Home prices affect consumption in two ways.

First, if the value of a house increases, this may encourage homeowners to increase consumption because they believe that their wealth has increased.

Second, homeowners may be more willing to borrow because the house can be used as collateral, reducing credit constraints.

Target Specification And Characterization:

1. Importing the required packages into our python environment
2. Importing the house price data and do some EDA on it
3. Data Visualization on the house price data
4. Feature Selection & Data Split
5. Modeling the data using the algorithms

6. Predicting the sale price using linear regression

External Search(information source):

Importing Data And EDA

As we are going to work with the house price dataset that contains various features and information about the house and its sale price. Using the function provided by the Pandas package, we can import the data into our python environment. After importing the data, we can use the

‘head’ function to get a glimpse of our dataset.

Id	LotArea	MasVnrArea	BsmtUnfSF	TotalBsmtSF	1stFlrSF	2ndFlrSF	GrLivArea	GarageArea	WoodDeckSF	OpenPorchSF	SalePrice
1	8450	196.0	150	856	856	854	1710	548	0	61	208500
2	9600	0.0	284	1262	1262	0	1262	460	298	0	181500
3	11250	162.0	434	920	920	866	1786	608	0	42	223500
4	9550	0.0	540	756	961	756	1717	642	0	35	140000
5	14260	350.0	490	1145	1145	1053	2198	836	192	84	250000

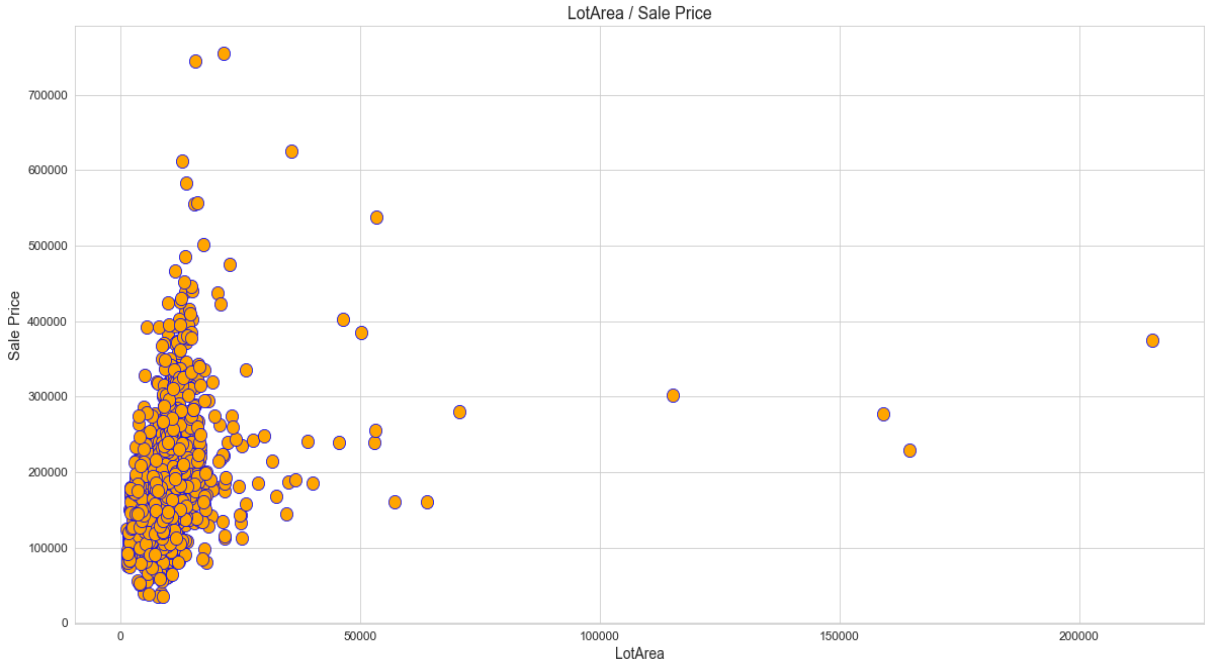
The dataset consists of the following entities:

Scatter plot

Like heatmap, a scatter plot is also used to observe linear relations between two variables in a dataset. In a scatter plot, the dependent variable is marked on the x-axis and the independent variable is marked on the y-axis. In our case, the ‘SalePrice’ attribute is the dependent variable, and every other are the independent variables. It would be difficult to produce a plot for each variable, so we can define a function that takes only the dependent variable and returns a scatter plot for every independent variable present in a dataset.

```
LotArea          0
MasVnrArea       0
BsmtUnfSF        0
TotalBsmtSF      0
1stFlrSF         0
2ndFlrSF         0
GrLivArea        0
GarageArea       0
WoodDeckSF       0
OpenPorchSF      0
SalePrice        0
dtype: int64
```

Benchmarking:


LotArea / Sale Price
Sale Price
LotArea
0
100000
200000
300000
400000
500000
600000
700000
0
50000
100000
150000
200000


MasVnrArea / Sale Price
Sale Price
MasVnrArea
0
100000
200000
300000
400000
500000
600000
700000
0
200
400
600
800
1000
1200
1400
1600

Applicable constraints

1. The aim is to predict the efficient house pricing for real estate customers with respect to their budgets and priorities. By analyzing previous market trends and price ranges, and also upcoming developments future prices will be predicted.
2. What is the objective of house price prediction?

The aim is to predict the efficient house pricing for real estate customers with respect to their budgets and priorities. By analyzing previous market trends and price ranges, and also upcoming developments future prices will be predicted.

3. Predictive modeling is a commonly used statistical technique to predict future behavior. Predictive modeling solutions are a form of data-mining technology that works by analyzing

historical and current data and generating a model to help predict.

Business Opportunity:

1.Data from Rightmove put annual house price growth at 9.7% in June, but the property website has projected this to fall to **around 5%** by the end of 2022. This projection may be partly due to the fact that monthly house prices increased by just 0.4% in June, the smallest rise since January.

2.The housing market is closely linked to consumer spending. When house prices go up, homeowners become better off and feel more confident. Some people will borrow more against the value of their home, either to spend on goods and services, renovate their house, supplement their pension, or pay off other debt.

3. Put simply: If you buy now, you lock in a price and mortgage payment in today's dollars — not the

less valuable dollars of the future. Buying soon can also help consumers avoid skyrocketing rent prices, which are rising faster than home prices in many places.

Concept Generation:

In This Project, EDA was equally important for exploring the relationship between the different features and the target (house sale price). For numeric features, I created a correlation matrix and specifically looked for any features that had a correlation. This step helped me identify several features that were strongly correlated with the sale price, including the overall quality of the house, the living area, and the size of the house (square footage).

Concept Development:

The purpose of the project is to predict the market value of the property being sold. This program helps to find the starting price of a location based on location variables. Similarly, consider a situation in which a person needs to sell a house. By using a real estate pricing system, the seller will be able to determine what features he can add to the house so that the house can be sold at a higher price.

Data visualization and distribution of data and full detailed functions are not included in this project.

There is a great need for Pre-Data Processing because if the data we provide to our model is accurate and flawless ,only the model will be able to provide accurate estimates that are very close to the actual values.

Final Report Prototype:

Front -End:

The user must be given many options to choose .In terms of selection of size and different aspects matters .data visualization and an interactive manual development must be present in an organized form.

Then customer feedback is the important factor. A valuable feedback system must be developed to understand the customer's needs and in valuable progress of the model.

Back -End:

Model Development is the main factor in this house sale prediction model. To optimized the tasks the linear regression and different supervised algo is applied.

To minimize overfitting of the model the algorithm optimization is necessary .

Performing EDA to realize the dependent and independent variables and showing benchmarking and all applicable constraints involves the purpose of this model.

It is evident that Product Details - How It Works?

Conclusion:

Primarily we have used simple regression to predict the price of the house easily. However, you can use multivariable regression to predict the results more accurately using different variables. Apart from it, we have used a complete dataset that has accurate information regarding the houses. Majorly, all of the above codes and libraries we have used are not unique as there is a specific procedure to perform the house prediction procedure by linear regression.

Reference /Source Of Information:

1.https://linuxhint.com/house-price-prediction-linear-regression/

2. https://simplicable.com/new/customer-needs-analysis

3.https://www.researchgate.net/publication/349477129_House_Price_Prediction