Third Progress Report

of

Project - I

Subject Code: 4IT31

Academic Year 2021-22

Group Number : G - 13

Name of Students	**: Kalp Gohil**	**18IT405**
	Man Desai	**18IT404**
	Param Shah	**18IT413**
	Jay Patel	**17IT419**

Topic : House Price Prediction

Guide Name : Prof. Prachi Shah

BACHELOR OF ENGINEERING

In

INFORMATION TECHNOLOGY

Birla Vishvakarma Mahavidyalaya
Engineering College,
Vallabh Vidhyanagar-388120

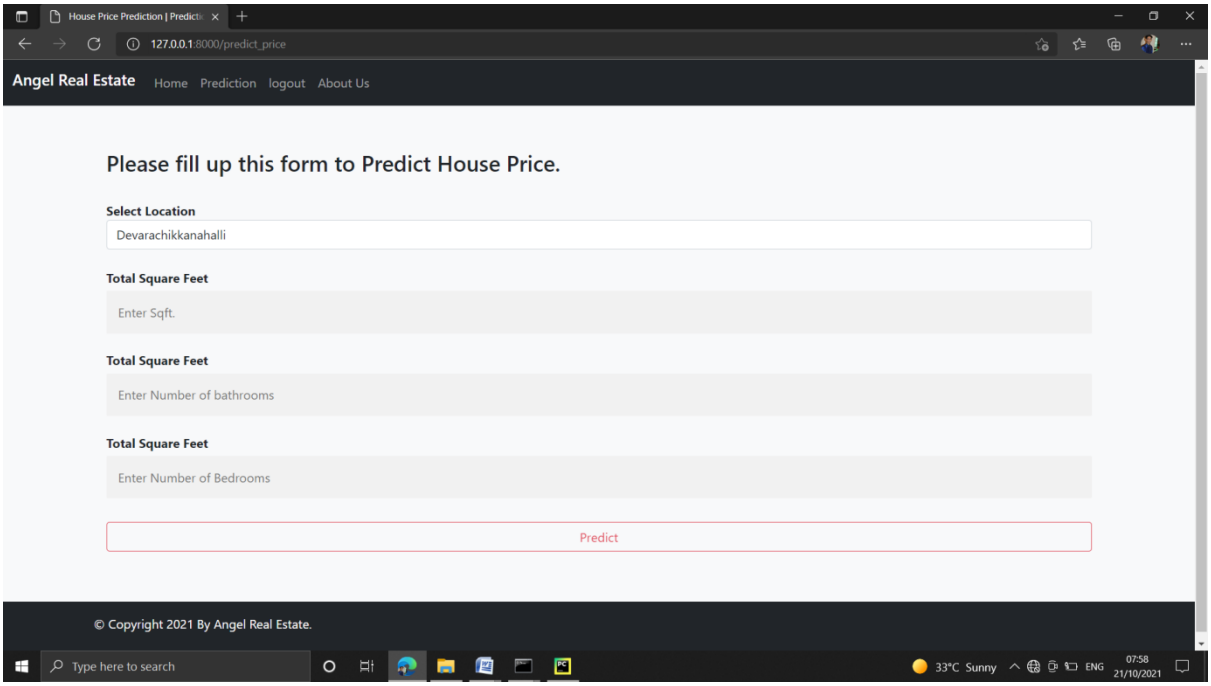
Table of Content

1 – Previous Work Done :

- Sign-Up / Login
- Data Cleaning & Pre-Processing
- UI Design

2 – Further Work Done on Modules :

❖ Prediction Page:



Code:

```
{% extends 'common.html' %}
{% load static %}
{% block title %} House Price Prediction | Prediction {% endblock %}
{% block content %}
  <!-- Form Start -->
  <div class="container my-4">
    <form action="predict_price_actual" method="GET">

      <div class="container">
        <h3>Please fill up this form to Predict House Price.</h3>

        <br>
        <label for="location"><b>Select Location</b></label>
```

```
<select class="selectpicker form-control" id="location" name="location" required>

    {% for location in locations %}
    <option value="{{ location }}">{{ location }}</option>
    {% endfor %}
</select><br>

<label for="sqft"><b>Total Square Feet</b></label>
<input type="text" placeholder="Enter Sqft." id="sqft" name="sqft" required>

<label for="bath"><b>Total Square Feet</b></label>
<input type="text" placeholder="Enter Number of bathrooms" id="bath" name="bath" required>

<label for="bhk"><b>Total Square Feet</b></label>
<input type="text" placeholder="Enter Number of Bedrooms" id="bhk" name="bhk" required>

<button type="submit" class="btn btn-outline-danger">Predict</button>

    </div>
  </form>
</div>
<!-- Form End -->
{% endblock %}
```

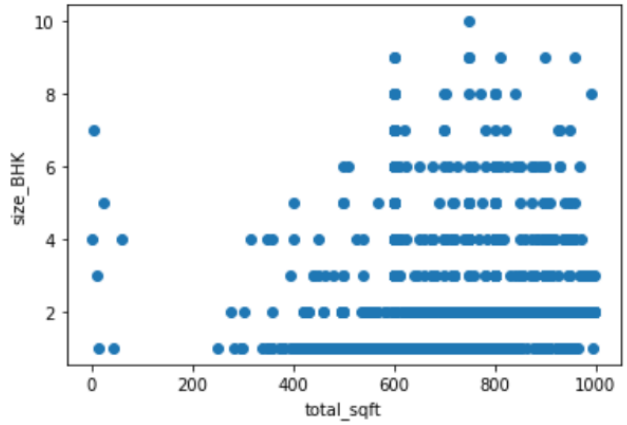
❖ Data Cleaning & Pre-Processing:

- **Description:**In this module, first of all, data set has been imported, then data has been cleaned and pre processed in order to predict accurate price.

Code:

- **Outlier Removal using Business Logic.**
  - **Check size of each room.**

```
x = house[house['total_sqft'] < 1000]['total_sqft']
y = house[house['total_sqft'] < 1000]['size_BHK']
plt.scatter(x, y)
plt.ylabel('size_BHK')
plt.xlabel('total_sqft')
plt.show()
```



As a data scientist, when we have a conversation with business manager (who has expertise in real estate domain), he/she will tell that normally sq.ft. per bedroom is 300. If we have 400sq.ft apartment with 2 bhk, then that is like outlier for us. We will remove such outliers by keeping our minimum thresold for sq.ft per bhk to 300.

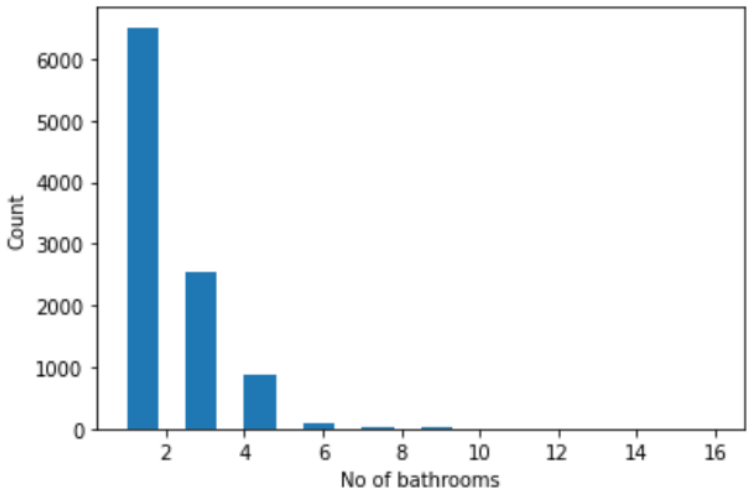
```
house = house[~((house['total_sqft']  / house['size_BHK']) < 300)]
```

- **Check no of bathrooms.**

```
plt.hist(house['bathroom'], width=0.8)
```

```
plt.xlabel('No of bathrooms')
plt.ylabel('Count')
```

```
Text(0, 0.5, 'Count')
```



After conversation with business manager (who has expertise in real estate domain), he/she will tell that normally number of bathrooms is equal or one more than number of rooms.

```
house = house[~(house['bathroom'] > house['size_BHK']+2)]
house = house[~(house['bathroom'] >= 9)]
```

❖ Train-Test Split using Sklearn:

```
X = house.drop(['price_lakhs'], axis=1)
Y = house['price_lakhs']
from sklearn.model_selection import train_test_split
X_train, X_test, Y_train, Y_test = train_test_split(X, Y, test_size=0.2)
print("X_train =", X_train.shape)
print("Y_train =", Y_train.shape)
print("X_test =", X_test.shape)
print("Y_test =", Y_test.shape)
```

```
X_train = (8072, 4)
Y_train = (8072,)
X_test = (2018, 4)
Y_test = (2018,)
```

❖ Handling Categorical Column:

```
from sklearn.preprocessing import OneHotEncoder
from sklearn.compose import make_column_transformer
from sklearn.pipeline import make_pipeline
from sklearn.linear_model import LinearRegression
from sklearn.metrics import mean_squared_error


ohe = OneHotEncoder()
ohe.fit(X[['location']])
ohe.categories_


column_trans = make_column_transformer((OneHotEncoder(categories=ohe.categories_), ['location']), remainder='passthrough')
```

❖ Selecting Model:

- **Description:** We tried many regression model and results of them are as follow.

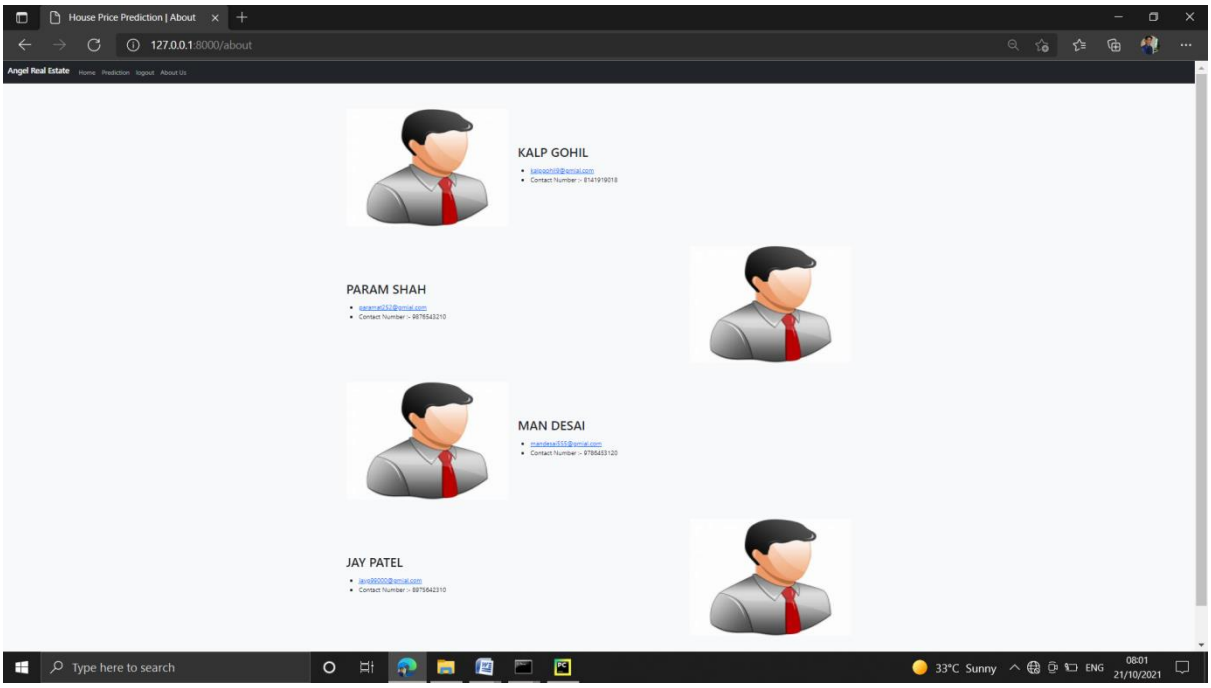
```
---- For Linear Regression ----
Accuracy :  82.8091182793346 %
RMSE :  34.908484140321875

---- For Decision Tree Regression ----
Accuracy :  76.65343414199555 %
RMSE :  40.68116843238034

---- For SVR ----
Accuracy :  46.47308668476266 %
RMSE :  61.59819898734227

---- For Lasso Regression ----
Accuracy :  77.48152037294282 %
RMSE :  39.95318874050546

---- For Ridge Regression ----
Accuracy :  76.68507224446014 %
RMSE :  40.65359454156182
```

So, Here Linear Regression performs well.

❖ UI Design:

- **Description:** Here we had design about page.

About Page



3 - Remaining work and Future Planning :

As Part of Second mid we have completed around 80% - 90% work and we are remaining with following work module wise:

1) **Model Training:**
   - Here, as mentioned Linear Regression performs well. So we will train cleaned data using Linear Regression.

2) **UI Design:**
   - As a front end, all the required pages has been designed. In backend, we need to attach our trained model with this website.
   - Also so UI part needs improvement, So we will be doing that also in this time.

➢ So, next we are planning to complete almost 100% of project before the second mid presentation. In that time we will complete our model training part along with its UI integration and as mentioned above.

4 - Conclusion:

As part of second mid presentation we have completed our SRS and other three progress report and also, we are done with around 80% - 90% work on actual system implementation. If some changes are required then we will take that into consideration and do changes in completed work.

*****The End*****