varun-house-price-prediction

September 26, 2023

[1]:
```
# Load the dataset from CSV
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import pandas as pd
%matplotlib inline
```

[13]:
```
# Load the data
df = pd.read_csv('house.CSV')
df.head()
```

[13]:

	date	price	bedrooms	bathrooms	sqft_living	sqft_lot
0	2014-05-02 00:00:00	313000.0	3.0	1.50	1340	7912
1	2014-05-02 00:00:00	2384000.0	5.0	2.50	3650	9050
2	2014-05-02 00:00:00	342000.0	3.0	2.00	1930	11947
3	2014-05-02 00:00:00	420000.0	3.0	2.25	2000	8030
4	2014-05-02 00:00:00	550000.0	4.0	2.50	1940	10500

	floors	waterfront	view	condition	sqft_above	sqft_basement	yr_built
0	1.5	0	0	3	1340	0	1955
1	2.0	0	4	5	3370	280	1921
2	1.0	0	0	4	1930	0	1966
3	1.0	0	0	4	1000	1000	1963
4	1.0	0	0	4	1140	800	1976

	yr_renovated	street	city	statezip	country
0	2005	18810 Densmore Ave N	Shoreline	WA 98133	USA
1	0	709 W Blaine St	Seattle	WA 98119	USA
2	0	26206-26214 143rd Ave SE	Kent	WA 98042	USA
3	0	857 170th Pl NE	Bellevue	WA 98008	USA
4	1992	9105 170th Ave NE	Redmond	WA 98052	USA

[14]:
```
# Check for missing values
df.isnull().sum()
```

[14]:
```
date            0
price           0
```

```
bedrooms         0
bathrooms        0
sqft_living      0
sqft_lot         0
floors           0
waterfront       0
view             0
condition        0
sqft_above       0
sqft_basement    0
yr_built         0
yr_renovated     0
street           0
city             0
statezip         0
country          0
dtype: int64
```

[15]:
```
# Summary statistics of the dataset
print(df.describe())
```

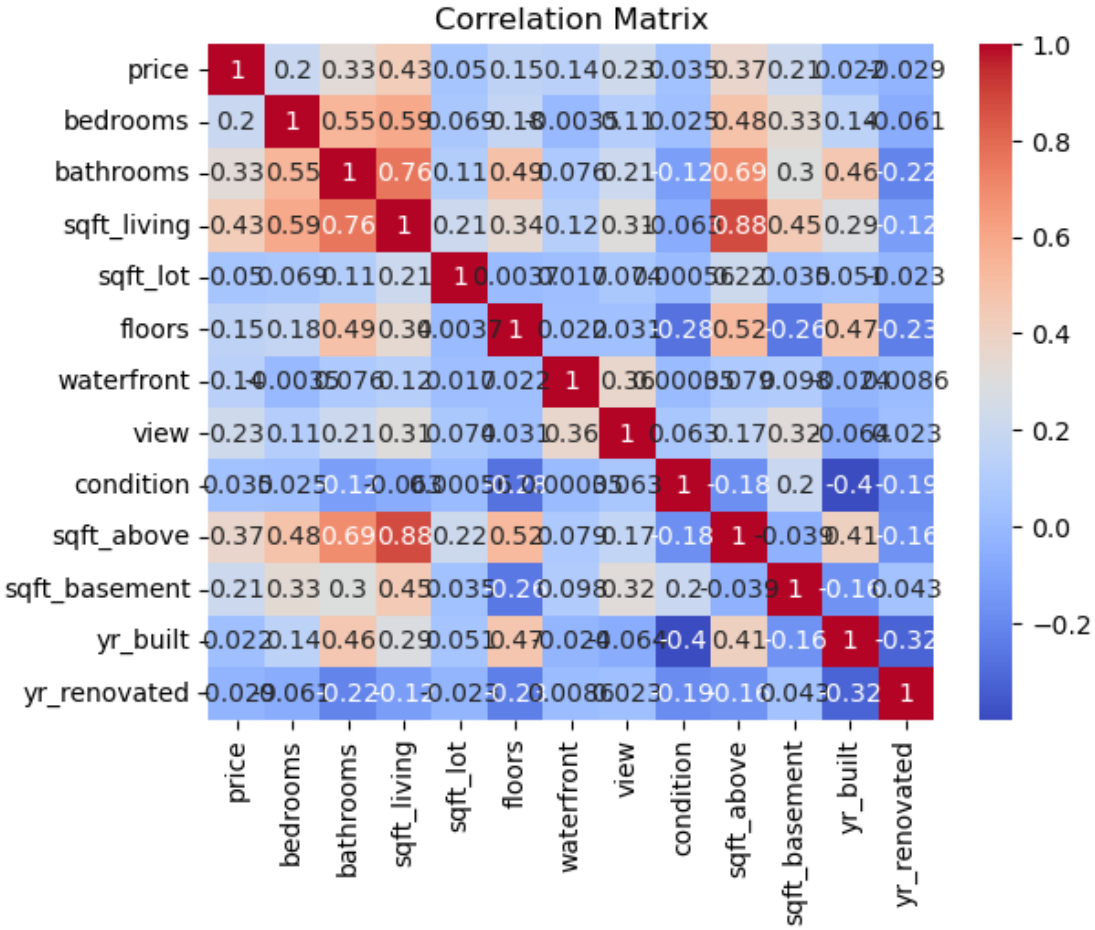
```
              price     bedrooms    bathrooms   sqft_living      sqft_lot  \
count  4.600000e+03  4600.000000  4600.000000   4600.000000  4.600000e+03
mean   5.519630e+05     3.400870     2.160815   2139.346957  1.485252e+04
std    5.638347e+05     0.908848     0.783781    963.206916  3.588444e+04
min    0.000000e+00     0.000000     0.000000    370.000000  6.380000e+02
25%    3.228750e+05     3.000000     1.750000   1460.000000  5.000750e+03
50%    4.609435e+05     3.000000     2.250000   1980.000000  7.683000e+03
75%    6.549625e+05     4.000000     2.500000   2620.000000  1.100125e+04
max    2.659000e+07     9.000000     8.000000  13540.000000  1.074218e+06

            floors   waterfront         view    condition   sqft_above  \
count  4600.000000  4600.000000  4600.000000  4600.000000  4600.000000
mean      1.512065     0.007174     0.240652     3.451739  1827.265435
std       0.538288     0.084404     0.778405     0.677230   862.168977
min       1.000000     0.000000     0.000000     1.000000   370.000000
25%       1.000000     0.000000     0.000000     3.000000  1190.000000
50%       1.500000     0.000000     0.000000     3.000000  1590.000000
75%       2.000000     0.000000     0.000000     4.000000  2300.000000
max       3.500000     1.000000     4.000000     5.000000  9410.000000

       sqft_basement     yr_built  yr_renovated
count    4600.000000  4600.000000   4600.000000
mean      312.081522  1970.786304    808.608261
std       464.137228    29.731848    979.414536
min         0.000000  1900.000000      0.000000
25%         0.000000  1951.000000      0.000000
```

```
50%          0.000000   1976.000000      0.000000
75%        610.000000   1997.000000   1999.000000
max       4820.000000   2014.000000   2014.000000
```

[16]:
```
# Correlation matrix to understand feature relationships
correlation_matrix = df.corr()
sns.heatmap(correlation_matrix, annot=True, cmap='coolwarm')
plt.title("Correlation Matrix")
plt.show()
```



[17]:
```
# Preprocessing: Selecting features and target variable
X = df[['bedrooms', 'bathrooms', 'sqft_living', 'sqft_lot', 'floors',␣
  ↪'waterfront', 'view', 'condition']]
y = df['price']
```

[19]:
```
# Splitting the dataset into training and testing sets
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,␣
↪random_state=42)
```

[21]:
```
# Building the Linear Regression Model
from sklearn.linear_model import LinearRegression
model = LinearRegression()
```

[22]:
```
model.fit(X_train, y_train)
```

[22]:
```
LinearRegression()
```

[25]:
```
y_pred = model.predict(X_test)
y_pred
```

[25]:
```
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```
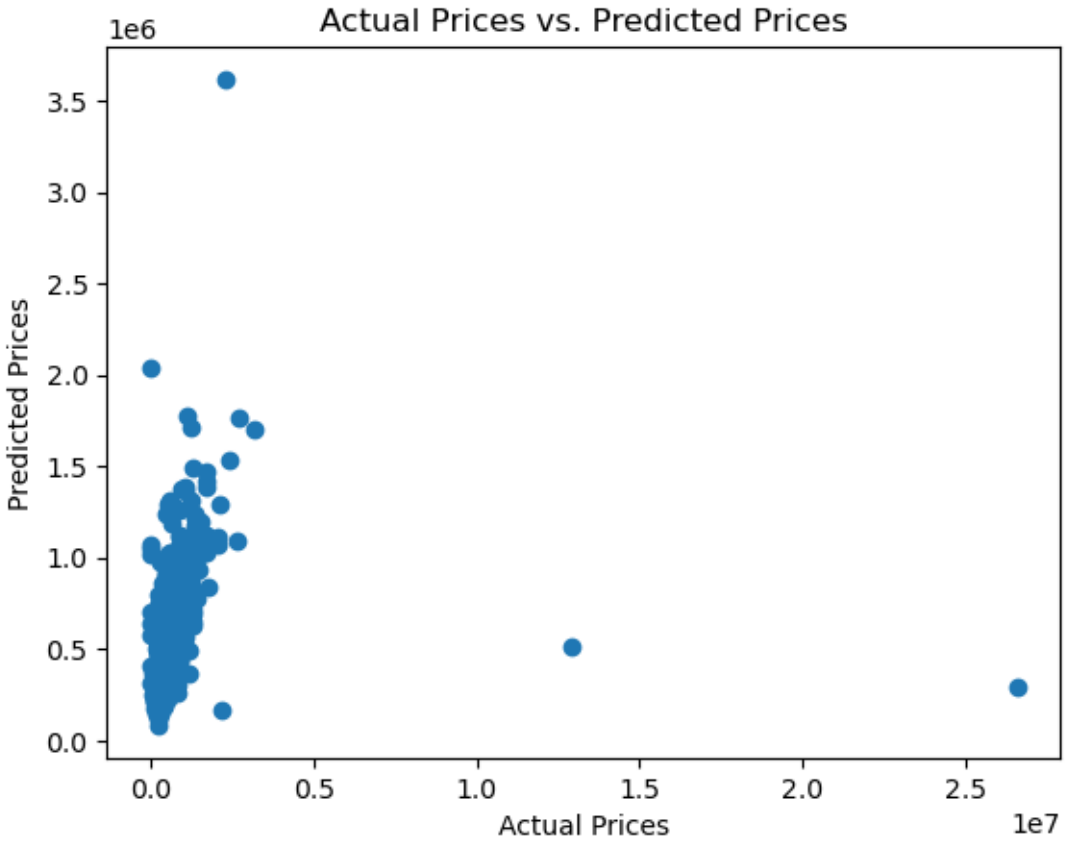

[30]:
```
from sklearn.metrics import r2_score
from sklearn.metrics import mean_squared_error
r2 = r2_score(y_test, y_pred)
mse = mean_squared_error(y_test, y_pred)
print("Mean Squared Error:", mse)
print("R-squared:", r2)
```

```
Mean Squared Error: 986869414953.9803
R-squared: 0.032335189956324784
```

[31]:
```
plt.scatter(y_test, y_pred)
plt.xlabel("Actual Prices")
plt.ylabel("Predicted Prices")
plt.title("Actual Prices vs. Predicted Prices")
plt.show()
```



[35]:
```
new_data = [[3, 2, 1500, 4000, 1, 0, 0, 3]]
predicted_price = model.predict(new_data)
```

```
C:\Users\Logeshwaran\anaconda3\lib\site-packages\sklearn\base.py:450:
UserWarning: X does not have valid feature names, but LinearRegression was
fitted with feature names
  warnings.warn(
```

[36]:
```
print("Predicted Price:", predicted_price[0])
```

```
Predicted Price: 331038.96876928967
```

[ ]: