```
# 1. Import Libraries
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
from sklearn.metrics import mean_absolute_error, mean_squared_error, r2_score
```

```
# Step 2 Load Data
df=pd.read_csv('Housing.csv')
df.head(5)
```

	price	area	bedrooms	bathrooms	stories	mainroad	guestroom	basement	hotwaterheating	airconditioning	parking	prefarea	furn
0	13300000	7420	4	2	3	yes	no	no	no	yes	2	yes	
1	12250000	8960	4	4	4	yes	no	no	no	yes	3	no	
2	12250000	9960	3	2	2	yes	no	yes	no	no	2	yes	
3	12215000	7500	4	2	2	yes	no	yes	no	yes	3	yes	
4	11410000	7420	4	1	2	yes	yes	yes	no	yes	2	no	

Next steps: Generate code with df | View recommended plots | New interactive sheet

```
df.shape
```

```
(545, 13)
```

```
df.isnull().sum()
```

	0
price	0
area	0
bedrooms	0
bathrooms	0
stories	0
mainroad	0
guestroom	0
basement	0
hotwaterheating	0
airconditioning	0
parking	0
prefarea	0
furnishingstatus	0

dtype: int64

```
df.describe()
```

	price	area	bedrooms	bathrooms	stories	parking
count	5.450000e+02	545.000000	545.000000	545.000000	545.000000	545.000000
mean	4.766729e+06	5150.541284	2.965138	1.286239	1.805505	0.693578
std	1.870440e+06	2170.141023	0.738064	0.502470	0.867492	0.861586
min	1.750000e+06	1650.000000	1.000000	1.000000	1.000000	0.000000
25%	3.430000e+06	3600.000000	2.000000	1.000000	1.000000	0.000000
50%	4.340000e+06	4600.000000	3.000000	1.000000	2.000000	0.000000
75%	5.740000e+06	6360.000000	3.000000	2.000000	2.000000	1.000000
max	1.330000e+07	16200.000000	6.000000	4.000000	4.000000	3.000000

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 545 entries, 0 to 544
Data columns (total 13 columns):
 #   Column            Non-Null Count  Dtype
---  ------            --------------  -----
 0   price             545 non-null    int64
 1   area              545 non-null    int64
 2   bedrooms          545 non-null    int64
 3   bathrooms         545 non-null    int64
 4   stories           545 non-null    int64
 5   mainroad          545 non-null    object
 6   guestroom         545 non-null    object
 7   basement          545 non-null    object
 8   hotwaterheating   545 non-null    object
 9   airconditioning   545 non-null    object
 10  parking           545 non-null    int64
 11  prefarea          545 non-null    object
 12  furnishingstatus  545 non-null    object
dtypes: int64(6), object(7)
memory usage: 55.5+ KB
```

```
# Convert categorical variables to numeric using one-hot encoding
df = pd.get_dummies(df, drop_first=True)
```

```
# 3. Feature Selection
X = df.drop("price", axis=1)
y = df["price"]
```

```
# 4. Split into train and test sets
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
```

```
# 5. Train Linear Regression Model
lr = LinearRegression()
lr.fit(X_train, y_train)
```

```
▾ LinearRegression
LinearRegression()
```

```
# 6. Evaluate the model
y_pred = lr.predict(X_test)
mae = mean_absolute_error(y_test, y_pred)
mse = mean_squared_error(y_test, y_pred)
r2 = r2_score(y_test, y_pred)

print(f"MAE: {mae:.2f}")
print(f"MSE: {mse:.2f}")
print(f"R²: {r2:.2f}")
```

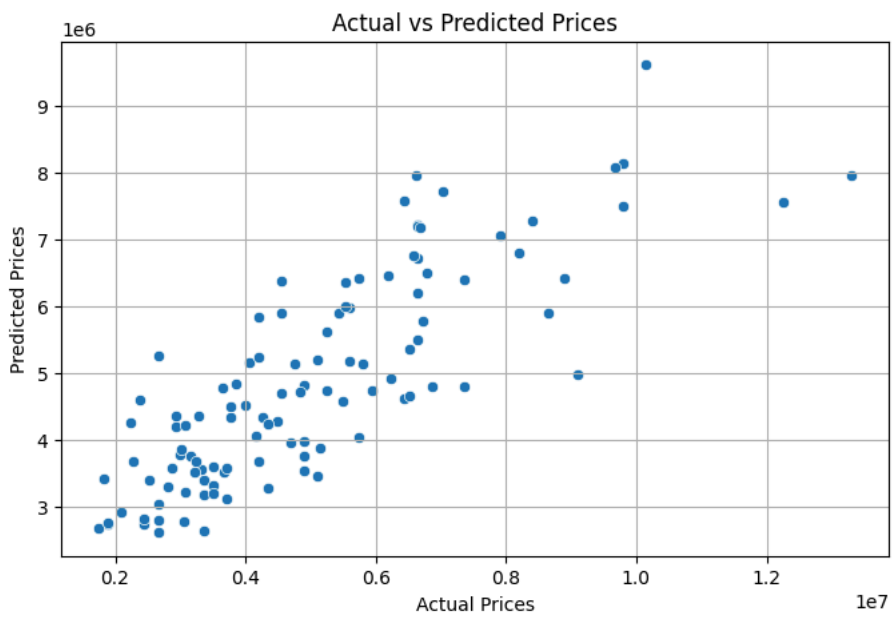
```
MAE: 970043.40
MSE: 1754318687330.66
R²: 0.65
```

```
# 7. Coefficients and Intercept
coeff_df = pd.DataFrame(lr.coef_, index=X.columns, columns=["Coefficient"])
```

```
print("\nModel Coefficients:")
print(coeff_df)
```

```
Model Coefficients:
                                  Coefficient
area                             2.359688e+02
bedrooms                         7.677870e+04
bathrooms                        1.094445e+06
stories                          4.074766e+05
parking                          2.248419e+05
mainroad_yes                     3.679199e+05
guestroom_yes                    2.316100e+05
basement_yes                     3.902512e+05
hotwaterheating_yes              6.846499e+05
airconditioning_yes              7.914267e+05
prefarea_yes                     6.298906e+05
furnishingstatus_semi-furnished -1.268818e+05
furnishingstatus_unfurnished    -4.136451e+05
```

```
# 8. Plotting Actual vs Predicted
plt.figure(figsize=(8, 5))
sns.scatterplot(x=y_test, y=y_pred)
plt.xlabel("Actual Prices")
plt.ylabel("Predicted Prices")
plt.title("Actual vs Predicted Prices")
plt.grid(True)
plt.show()
```



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