AI & ML Internship Task-3

By Elevate Labs

1.Import and preprocess the dataset.

In [24]:
```
import pandas as pd

# Load your horse dataset
df = pd.read_csv('Housing.csv')

# Replace 'yes' with 1 and 'no' with 0
df.replace({'yes': 1, 'no': 0}, inplace=True)

df.replace({'furnished' :1,'unfurnished':2,'semi-furnished':3},inplace=True)

# (No saving to CSV)
print(df.head())
```

```
      price  area  bedrooms  bathrooms  stories  mainroad  guestroom  \
0  13300000  7420         4          2        3         1          0
1  12250000  8960         4          4        4         1          0
2  12250000  9960         3          2        2         1          0
3  12215000  7500         4          2        2         1          0
4  11410000  7420         4          1        2         1          1

   basement  hotwaterheating  airconditioning  parking  prefarea  \
0         0                0                1        2         1
1         0                0                1        3         0
2         1                0                0        2         1
3         1                0                1        3         1
4         1                0                1        2         0

   furnishingstatus
0                 1
1                 1
2                 3
3                 1
4                 1
```

```
C:\Users\sujal\AppData\Local\Temp\ipykernel_13972\2031134496.py:7: FutureWarning: Downcasting behavior in `replace` is deprecated and will be removed in a future version. To retain the old behavior, explicitly call `result.infer_objects(copy=False)`. To opt-in to the future behavior, set `pd.set_option('future.no_silent_downcasting', True)`
  df.replace({'yes': 1, 'no': 0}, inplace=True)
C:\Users\sujal\AppData\Local\Temp\ipykernel_13972\2031134496.py:9: FutureWarning: Downcasting behavior in `replace` is deprecated and will be removed in a future version. To retain the old behavior, explicitly call `result.infer_objects(copy=False)`. To opt-in to the future behavior, set `pd.set_option('future.no_silent_downcasting', True)`
  df.replace({'furnished' :1,'unfurnished':2,'semi-furnished':3},inplace=True)
```

In [26]:
```
df
```

Out[26]:

	price	area	bedrooms	bathrooms	stories	mainroad	guestroom	basement	hotwaterheating	airconditioning	parking	prefarea	furnishingstatus
0	13300000	7420	4	2	3	1	0	0	0	1	2	1	1
1	12250000	8960	4	4	4	1	0	0	0	1	3	0	1
2	12250000	9960	3	2	2	1	0	1	0	0	2	1	3
3	12215000	7500	4	2	2	1	0	1	0	1	3	1	1
4	11410000	7420	4	1	2	1	1	1	0	1	2	0	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...
540	1820000	3000	2	1	1	1	0	1	0	0	2	0	2
541	1767150	2400	3	1	1	0	0	0	0	0	0	0	3
542	1750000	3620	2	1	1	1	0	0	0	0	0	0	2
543	1750000	2910	3	1	1	0	0	0	0	0	0	0	1
544	1750000	3850	3	1	2	1	0	0	0	0	0	0	2

545 rows × 13 columns

2.Split data into train-test sets.

In [57]:
```
X = df.iloc[:,1:13]
y = df['price']

from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
from sklearn.metrics import mean_squared_error, r2_score,mean_absolute_error

X_train,X_test,y_train,y_test = train_test_split(X, y, test_size=0.2, random_state=50)
```

3.Fit a Linear Regression model using sklearn.linear_model.

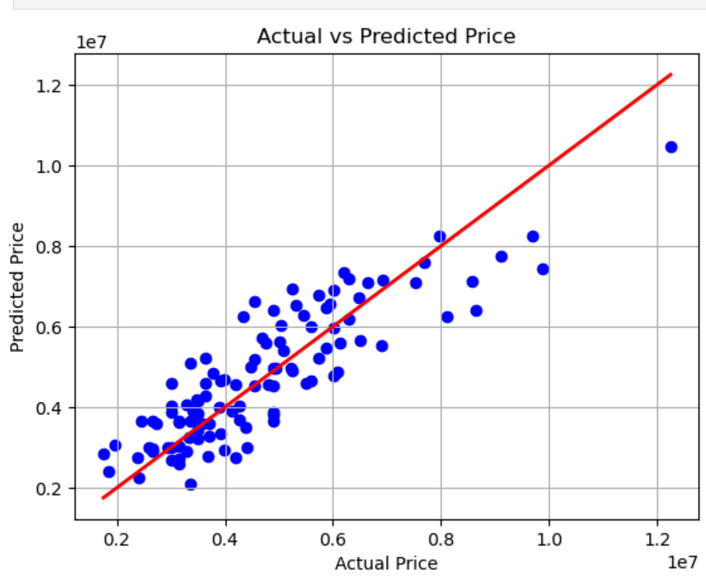
4.Evaluate model using MAE, MSE, R².

In [59]:
```
lr_model = LinearRegression()
lr_model.fit(X_train,y_train)

y_pred = lr_model.predict(X_test)

mse = mean_squared_error(y_test, y_pred)
r2 = r2_score(y_test, y_pred)
mae = mean_absolute_error(y_test, y_pred)

print("Mean Squared Error:", mse)
print("R2 Score:", r2)
print("mean absolute error is :", mae)
```

```
Mean Squared Error: 852563443450.0237
R2 Score: 0.7493099436288877
mean absolute error is : 745316.921824061
```

5.Plot regression line and interpret coefficients.

In [66]:
```
import matplotlib.pyplot as plt

plt.scatter(y_test, y_pred, color='blue')
plt.plot([y_test.min(), y_test.max()], [y_test.min(), y_test.max()], color='red', linewidth=2)  # perfect line
plt.xlabel('Actual Price')
plt.ylabel('Predicted Price')
plt.title('Actual vs Predicted Price')
plt.grid(True)
plt.show()
```



In [64]:
```
print("Intercept:", lr_model.intercept_)
coefficients = pd.DataFrame({'Feature': X.columns, 'Coefficient': lr_model.coef_})
print(coefficients)
```

```
Intercept: -407110.98745003715
             Feature    Coefficient
0               area     238.037531
1           bedrooms  129501.457438
2          bathrooms  949101.720050
3            stories  476971.998073
4           mainroad  584161.590414
5          guestroom  264903.335677
6           basement  332312.325001
7    hotwaterheating  911223.087147
8    airconditioning  916475.605650
9            parking  323939.763316
```

```
10          prefarea  685541.256199
11  furnishingstatus   51808.496467
```

In [ ]: