DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

23AMB201 - MACHINE LEARNING

II YEAR IV SEM

UNIT III – GENERATIVE MODELS AND BOOSTING

Program 1– Predict house prices based on several
parameters available in the Housing and
Urban Development of any dataset
using least squares linear regression.

	square_feet	num_bedrooms	num_bathrooms	price
0	1400	3	2	250000
1	1600	4	3	310000
2	1800	3	2	280000
3	1200	2	1	200000
4	2200	5	3	360000
5	1500	3	2	270000
6	1700	4	3	300000
7	1300	2	1	210000
8	2000	4	2	330000
9	2500	5	4	400000

```python
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
from sklearn.metrics import mean_squared_error
```

```python
df = pd.read_csv('House_data.csv')
df
```

```
[ ] X = df[['square_feet', 'num_bedrooms', 'num_bathrooms']]  # Independent variables
    y = df['price']  # Dependent variable

    # Split data into training and testing sets
    X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
```

```
model = LinearRegression()
model.fit(X_train, y_train)
y_pred = model.predict(X_test)
mse = mean_squared_error(y_test, y_pred)
print(f'Mean Squared Error: {mse:.2f}')
```
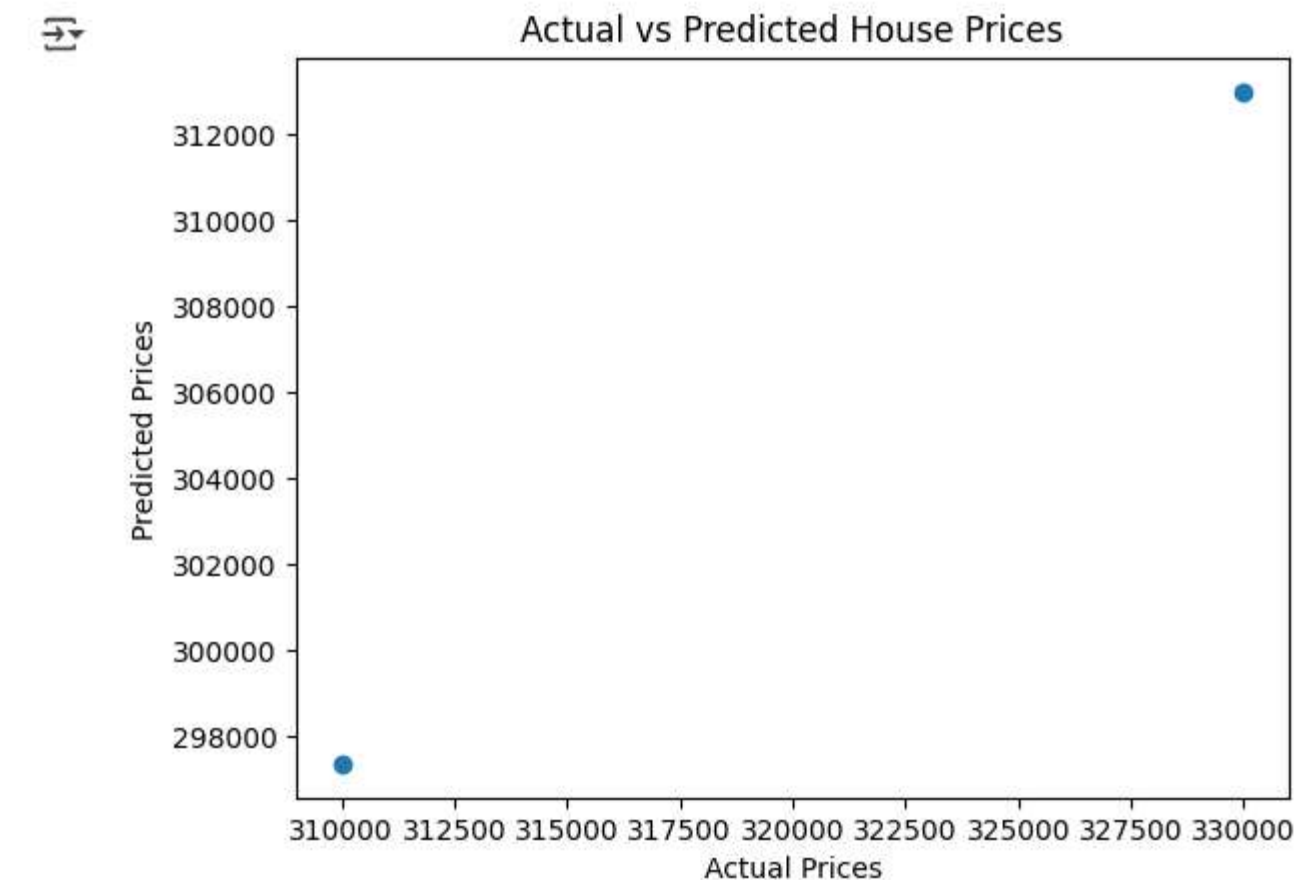
```
Mean Squared Error: 224576792.86
```

```
[ ]  print('Coefficients:', model.coef_)
     print('Intercept:', model.intercept_)
```

```
Coefficients: [   78.94736842 15263.15789474 15964.9122807 ]
Intercept: 62105.2631575969
```

```
plt.scatter(y_test, y_pred)
plt.xlabel('Actual Prices')
plt.ylabel('Predicted Prices')
plt.title('Actual vs Predicted House Prices')
plt.show()
```

```
[ ]   print('Coefficients:', model.coef_)
      print('Intercept:', model.intercept_)
```

```
Coefficients: [   78.94736842 15263.15789474 15964.9122807 ]
Intercept: 62105.2631575969
```

```
plt.scatter(y_test, y_pred)
plt.xlabel('Actual Prices')
plt.ylabel('Predicted Prices')
plt.title('Actual vs Predicted House Prices')
plt.show()
```
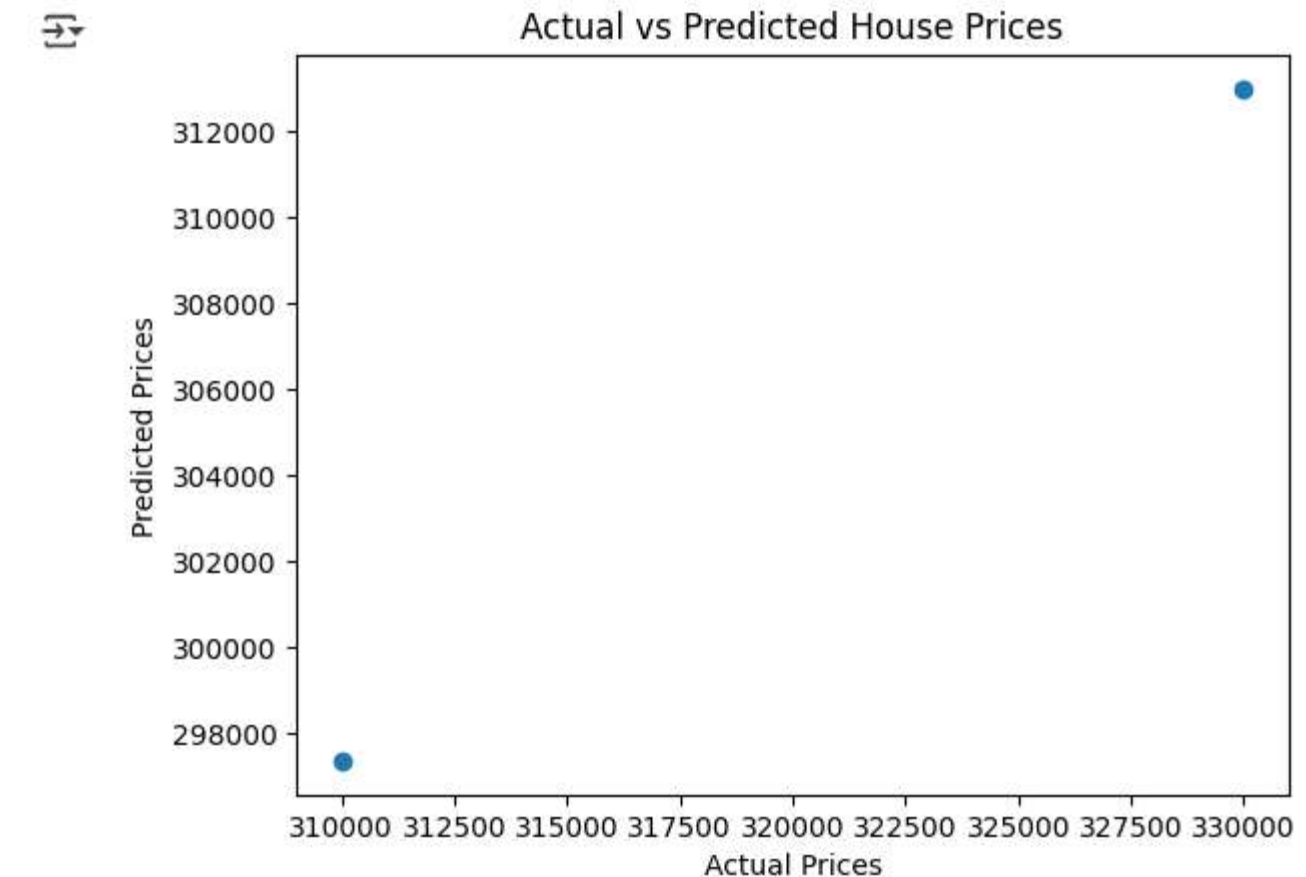

Actual vs Predicted House Prices

```python
new_house = np.array([[1400, 3, 2]])

predicted_price = model.predict(new_house)

print(f'Predicted Price for 1400 sqft, 3 bedrooms, 2 bathrooms: ${predicted_price[0]:,.2f}')
```

```
Predicted Price for 1400 sqft, 3 bedrooms, 2 bathrooms: $250,350.88
```

1. https://www.simplilearn.com/tutorials/machine-learning-tutorial/knn-in-python

2. https://www.youtube.com/watch?v=HZT0lxD5h6k