```
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
```

```
data=pd.read_csv('/content/drive/MyDrive/house_prediction.csv')
data.head()
```

	id	date	price	bedrooms	bathrooms	sqft_living	sqft_lot	floors	waterfront	view	...	grade	sqft_above	s
0	7129300520	20141013T000000	221900.0	3	1.00	1180	5650	1.0	0	0	...	7	1180	
1	6414100192	20141209T000000	538000.0	3	2.25	2570	7242	2.0	0	0	...	7	2170	
2	5631500400	20150225T000000	180000.0	2	1.00	770	10000	1.0	0	0	...	6	770	
3	2487200875	20141209T000000	604000.0	4	3.00	1960	5000	1.0	0	0	...	7	1050	
4	1954400510	20150218T000000	510000.0	3	2.00	1680	8080	1.0	0	0	...	8	1680	

5 rows × 21 columns

```
for column in data.columns:
    if data[column].dtype == 'object':
        # Fill missing values with the mode for categorical features
        data[column].fillna(data[column].mode()[0], inplace=True)
        if column in data.columns:
            data[column].fillna(data[column].mode()[0], inplace=True)
    else:
        # Fill missing values with the mean for numeric features
        data[column].fillna(data[column].mean(), inplace=True)
        if column in data.columns:
            data[column].fillna(data[column].mean(), inplace=True)

# Select features
features = ['sqft_living', 'sqft_lot', 'sqft_above', 'yr_built', 'sqft_living15']
X = data[features]
y = data['price']

# Split the training data for validation
X_train, X_val, y_train, y_val = train_test_split(X, y, test_size=0.2, random_state=42)

# Train the model
model = LinearRegression()
model.fit(X_train, y_train)
```

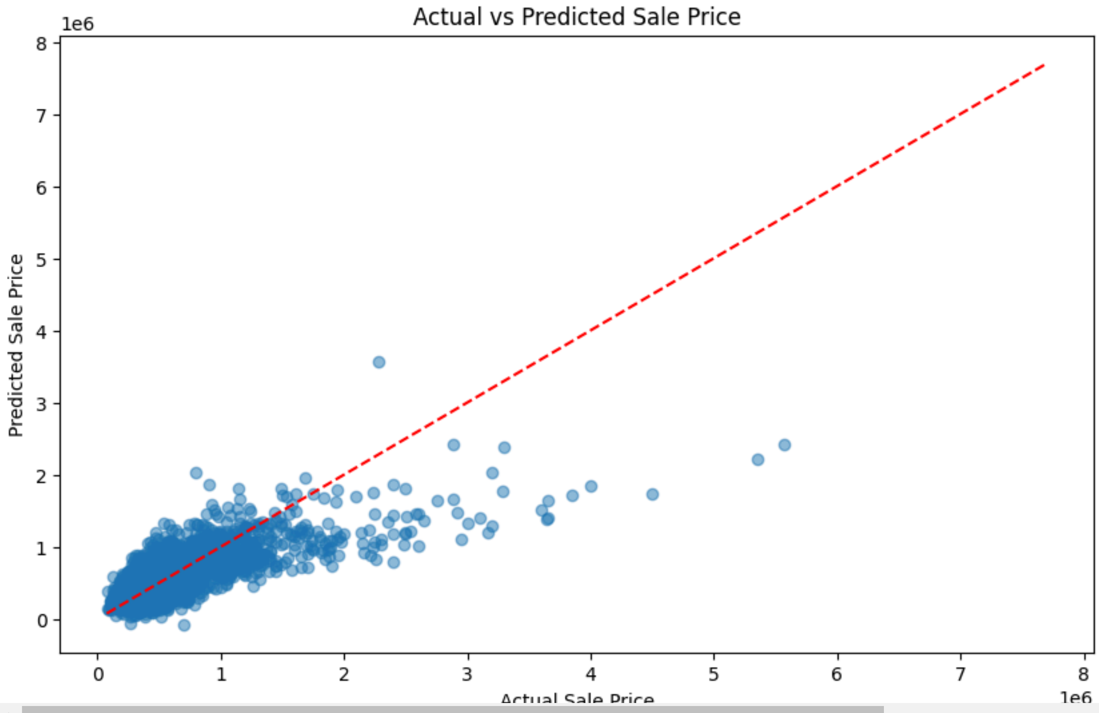
```
<ipython-input-6-7b55390d07be>:9: FutureWarning: A value is trying to be set on a copy of a DataFrame or Series through chained assignme
The behavior will change in pandas 3.0. This inplace method will never work because the intermediate object on which we are setting valu

For example, when doing 'df[col].method(value, inplace=True)', try using 'df.method({col: value}, inplace=True)' or df[col] = df[col].me


  data[column].fillna(data[column].mean(), inplace=True)
<ipython-input-6-7b55390d07be>:11: FutureWarning: A value is trying to be set on a copy of a DataFrame or Series through chained assignm
The behavior will change in pandas 3.0. This inplace method will never work because the intermediate object on which we are setting valu

For example, when doing 'df[col].method(value, inplace=True)', try using 'df.method({col: value}, inplace=True)' or df[col] = df[col].me


  data[column].fillna(data[column].mean(), inplace=True)
<ipython-input-6-7b55390d07be>:4: FutureWarning: A value is trying to be set on a copy of a DataFrame or Series through chained assignme
The behavior will change in pandas 3.0. This inplace method will never work because the intermediate object on which we are setting valu

For example, when doing 'df[col].method(value, inplace=True)', try using 'df.method({col: value}, inplace=True)' or df[col] = df[col].me


  data[column].fillna(data[column].mode()[0], inplace=True)
<ipython-input-6-7b55390d07be>:6: FutureWarning: A value is trying to be set on a copy of a DataFrame or Series through chained assignme
The behavior will change in pandas 3.0. This inplace method will never work because the intermediate object on which we are setting valu

For example, when doing 'df[col].method(value, inplace=True)', try using 'df.method({col: value}, inplace=True)' or df[col] = df[col].me


  data[column].fillna(data[column].mode()[0], inplace=True)
```

```
▾ LinearRegression ⓘ ?
LinearRegression()
```

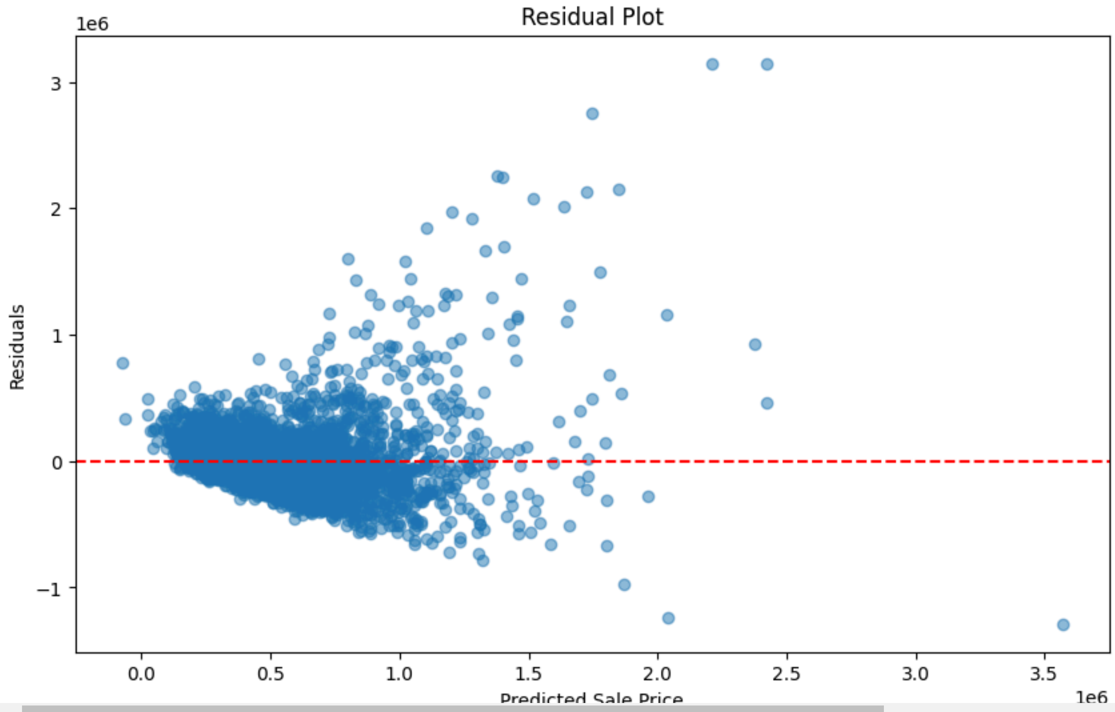
```
y_pred = model.predict(X_val)
mae = mean_absolute_error(y_val, y_pred)
mse = mean_squared_error(y_val, y_pred)
r2 = r2_score(y_val, y_pred)



print(f"Mean Absolute Error: {mae}")
print(f"Mean Squared Error: {mse}")
print(f"R-squared: {r2}")
```

```
Mean Absolute Error: 168809.22806895527
Mean Squared Error: 70157937762.06815
R-squared: 0.5364667482110097
```

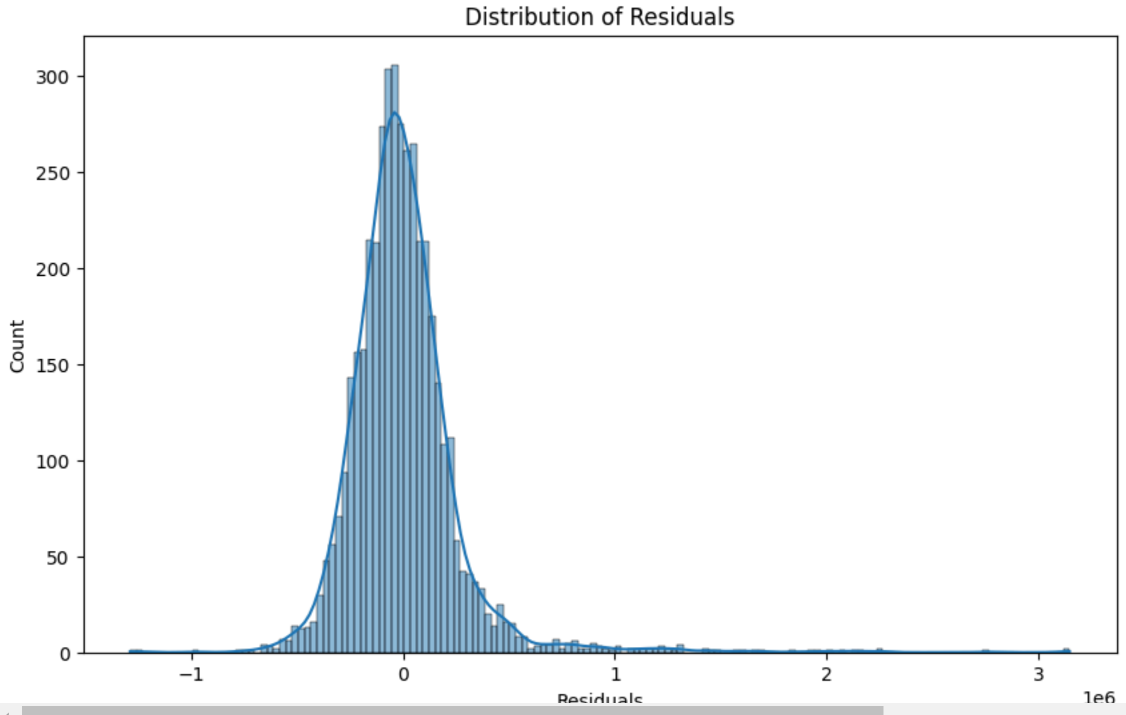
```
plt.figure(figsize=(10, 6))
plt.scatter(y_val, y_pred, alpha=0.5)
plt.xlabel('Actual Sale Price')
plt.ylabel('Predicted Sale Price')
plt.title('Actual vs Predicted Sale Price')
plt.plot([y.min(), y.max()], [y.min(), y.max()], 'r--')
plt.show()
```



```
residuals = y_val - y_pred
plt.figure(figsize=(10, 6))
plt.scatter(y_pred, residuals, alpha=0.5)
plt.xlabel('Predicted Sale Price')
plt.ylabel('Residuals')
plt.title('Residual Plot')
plt.axhline(y=0, color='r', linestyle='--')
plt.show()
```

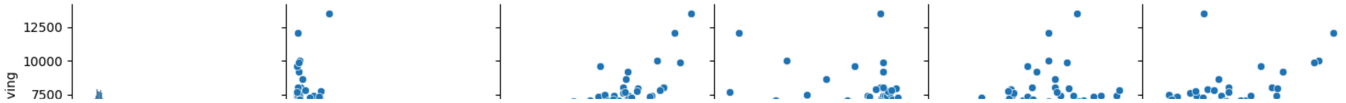


```
plt.figure(figsize=(10, 6))
sns.histplot(residuals, kde=True)
plt.xlabel('Residuals')
plt.title('Distribution of Residuals')
plt.show()
```



```
plt.figure(figsize=(12, 8))
sns.pairplot(data[features + ['price']])
plt.show()
```

```
<Figure size 1200x800 with 0 Axes>
```


12500
10000
7500
ving