Upload the Dataset

```
from google.colab import files
uploaded = files.upload()
```

Choose files raw_sales (1).csv

- **raw_sales (1).csv**(text/csv) - 1505497 bytes, last modified: 09/05/2025 - 100% done

```
Saving raw_sales (1).csv to raw_sales (1) (1).csv
```

Load the Dataset

```
import pandas as pd

# Load dataset
df = pd.read_csv('/content/raw_sales (1).csv')
df.head()
```

	datesold	postcode	price	propertyType	bedrooms
0	2007-02-07 00:00:00	2607	525000	house	4
1	2007-02-27 00:00:00	2906	290000	house	3
2	2007-03-07 00:00:00	2905	328000	house	3
3	2007-03-09 00:00:00	2905	380000	house	4
4	2007-03-21 00:00:00	2906	310000	house	3

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

Data Exploration

```
# Dataset Info
df.info()

# Summary Statistics
df.describe()

# First few records
df.head()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4 entries, 0 to 3
Data columns (total 2 columns):
 #   Column  Non-Null Count  Dtype
---  ------  --------------  -----
 0   A       3 non-null      float64
 1   B       3 non-null      float64
dtypes: float64(2)
memory usage: 196.0 bytes
```

	A	B
0	1.0	4.0
1	2.0	NaN
2	2.0	4.0
3	NaN	4.0

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

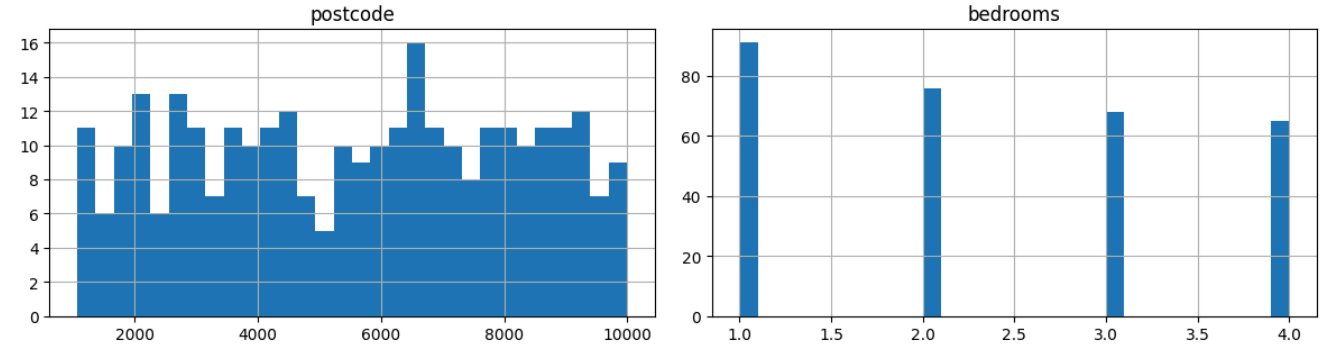
Check for Missing Values and Duplicates

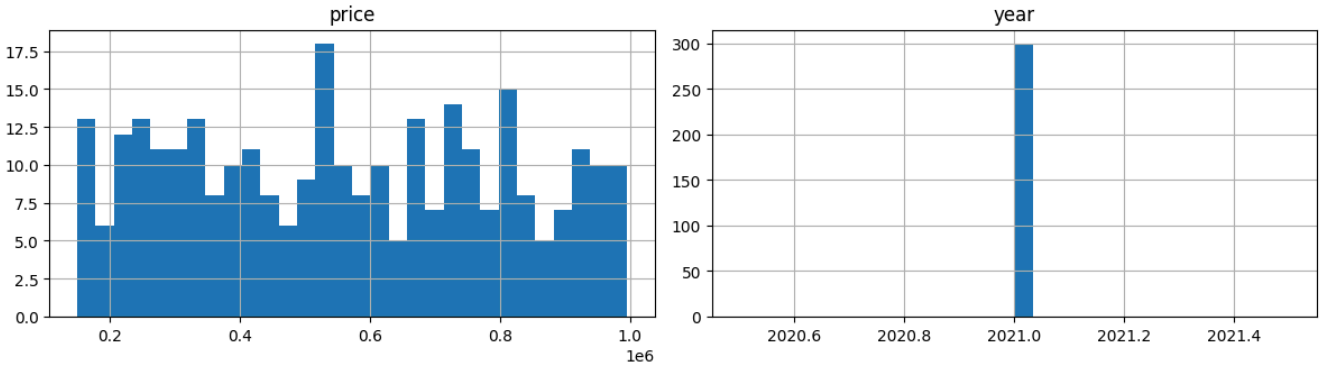
```
import pandas as pd
```

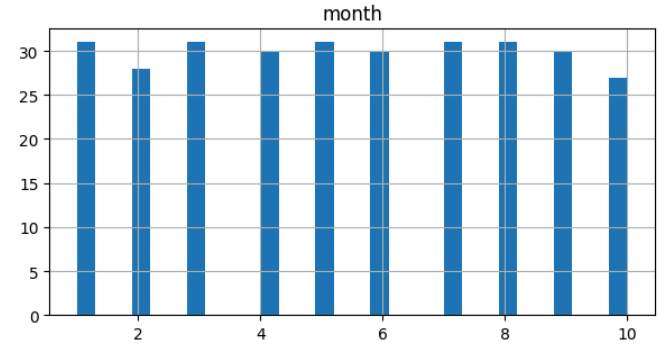
```
# Example: Create a sample DataFrame or load one
# Option 1: Create manually
data = {'A': [1, 2, 2, None], 'B': [4, None, 4, 4]}
df = pd.DataFrame(data)

# Option 2: Load from a file (e.g., CSV)
# df = pd.read_csv('your_file.csv')
```

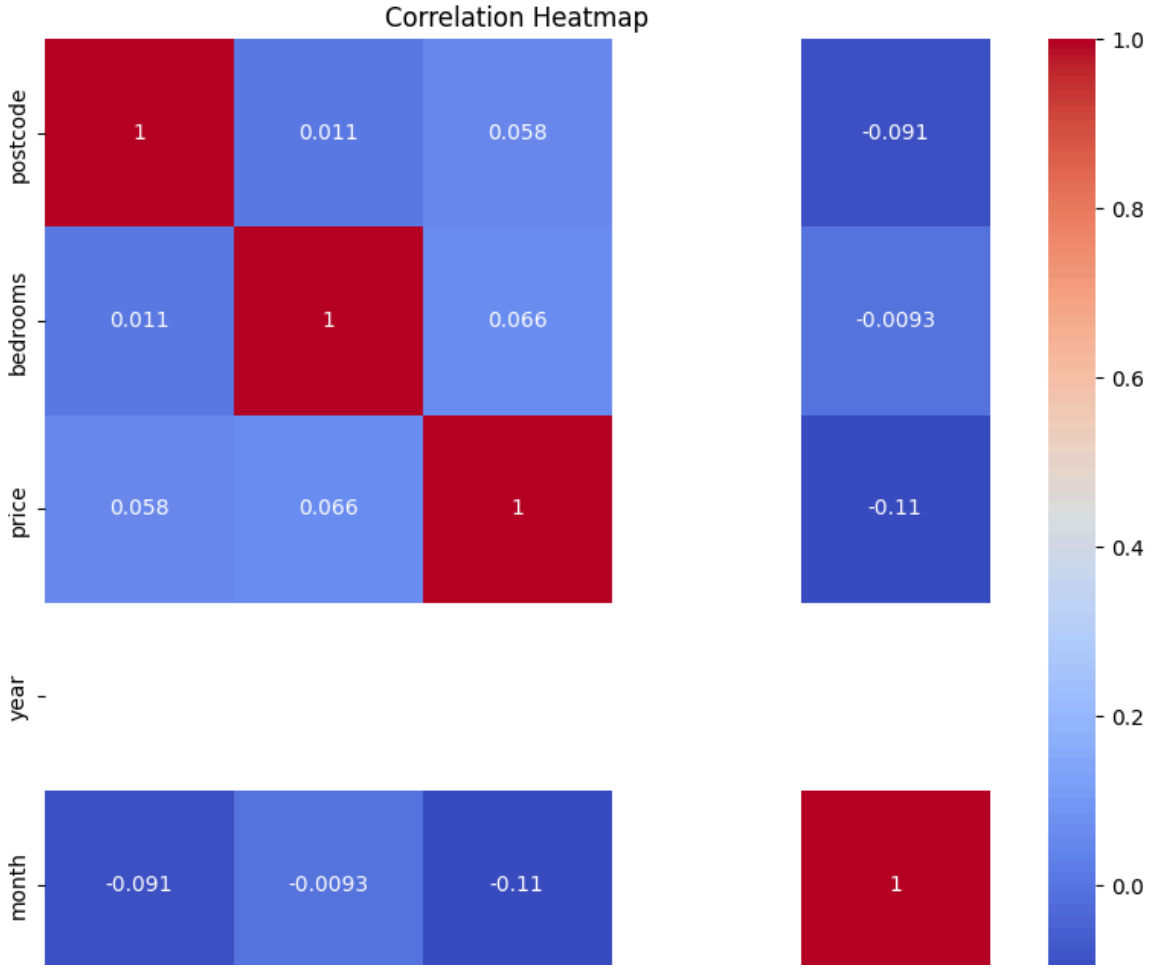
Visualize a Few Features

```
import matplotlib.pyplot as plt
import seaborn as sns

# Histogram of numerical columns
df.hist(bins=30, figsize=(12, 10))
plt.tight_layout()
plt.show()

# Correlation heatmap
plt.figure(figsize=(10, 8))
sns.heatmap(df.corr(numeric_only=True), annot=True, cmap='coolwarm')
plt.title('Correlation Heatmap')
plt.show()
```


postcode
bedrooms


price
year
1e6


month


Correlation Heatmap
postcode
bedrooms
price
year
month
1
0.011
0.058
-0.091
0.011
1
0.066
-0.0093
0.058
0.066
1
-0.11
-0.091
-0.0093
-0.11
1
1.0
0.8
0.6
0.4
0.2
0.0

Identify Target and Features

```
import os
print("Current working directory:", os.getcwd())
print("Files in current directory:", os.listdir())
```

```
Current working directory: /content
Files in current directory: ['.config', 'raw_sales (1).csv', 'sample_data']
```

Convert Categorical Columns to Numerical

```
import os

print("Current working directory:", os.getcwd())
print("Files in this directory:", os.listdir())
```

```
Current working directory: /content
Files in this directory: ['.config', 'raw_sales (1).csv', 'sample_data']
```

One-Hot Encoding

```
import os

# Check where Python is looking
print("Current working directory:", os.getcwd())

# List all files in that directory
print("Files in this directory:", os.listdir())
```

```
Current working directory: /content
Files in this directory: ['.config', 'raw_sales (1).csv', 'sample_data']
```

Feature Scaling

```
import pandas as pd
from sklearn.preprocessing import StandardScaler

# Load the dataset
df = pd.read_csv('/content/raw_sales (1).csv')  # Make sure this file exists

# Define X
X = df.copy()  # Or df.drop('target_column', axis=1)

# Identify categorical columns
categorical_cols = X.select_dtypes(include=['object']).columns.tolist()

# One-hot encode
X_encoded = pd.get_dummies(X, columns=categorical_cols, drop_first=True)

# Standardize the features
scaler = StandardScaler()
X_scaled = scaler.fit_transform(X_encoded)

# (Optional) Convert scaled array back to DataFrame
X_scaled_df = pd.DataFrame(X_scaled, columns=X_encoded.columns)
print(X_scaled_df.head())
```

```
   datesold_2007-03-07 00:00:00  datesold_2007-03-09 00:00:00  \
0                     -0.005814                     -0.005814
1                     -0.005814                     -0.005814
2                    171.985465                     -0.005814
3                     -0.005814                    171.985465
4                     -0.005814                     -0.005814

   datesold_2007-03-21 00:00:00  datesold_2007-04-04 00:00:00  \
0                     -0.005814                     -0.005814
1                     -0.005814                     -0.005814
2                     -0.005814                     -0.005814
3                     -0.005814                     -0.005814
4                    171.985465                     -0.005814

   datesold_2007-04-24 00:00:00  datesold_2007-04-30 00:00:00  ...  \
0                     -0.005814                     -0.005814  ...
1                     -0.005814                     -0.005814  ...
2                     -0.005814                     -0.005814  ...
3                     -0.005814                     -0.005814  ...
4                     -0.005814                     -0.005814  ...

   datesold_2019-07-18 00:00:00  datesold_2019-07-19 00:00:00  \
0                     -0.017446                      -0.01839
1                     -0.017446                      -0.01839
2                     -0.017446                      -0.01839
3                     -0.017446                      -0.01839
4                     -0.017446                      -0.01839

   datesold_2019-07-20 00:00:00  datesold_2019-07-22 00:00:00  \
0                     -0.015385                     -0.015385
1                     -0.015385                     -0.015385
2                     -0.015385                     -0.015385
3                     -0.015385                     -0.015385
4                     -0.015385                     -0.015385

   datesold_2019-07-23 00:00:00  datesold_2019-07-24 00:00:00  \
0                     -0.022525                     -0.011629
1                     -0.022525                     -0.011629
2                     -0.022525                     -0.011629
3                     -0.022525                     -0.011629
4                     -0.022525                     -0.011629

   datesold_2019-07-25 00:00:00  datesold_2019-07-26 00:00:00  \
0                     -0.022525                     -0.014244
1                     -0.022525                     -0.014244
2                     -0.022525                     -0.014244
3                     -0.022525                     -0.014244
4                     -0.022525                     -0.014244

   datesold_2019-07-27 00:00:00  propertyType_unit
0                     -0.010071          -0.452537
1                     -0.010071          -0.452537
2                     -0.010071          -0.452537
3                     -0.010071          -0.452537
4                     -0.010071          -0.452537

[5 rows x 3585 columns]
```

Train-Test Split

```
# Target and features
target = 'price'
features = ['datesold', 'postcode', 'propertyType', 'bedrooms']

X = df[features]
y = df[target]
```

Model Building

```
import os
print(os.getcwd())
```

```
/content
```

Evaluation

```
import pandas as pd
import numpy as np
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
from sklearn.ensemble import RandomForestRegressor
from sklearn.metrics import mean_squared_error, r2_score

# Generate mock data
np.random.seed(42)
n_samples = 500
df = pd.DataFrame({
    'datesold': pd.date_range(start='2018-01-01', periods=n_samples, freq='D'),
    'postcode': np.random.randint(1000, 9999, size=n_samples),
    'propertyType': np.random.choice(['House', 'Unit', 'Townhouse'], size=n_samples),
    'bedrooms': np.random.randint(1, 5, size=n_samples),
    'price': np.random.randint(100000, 1000000, size=n_samples)
})

# Target and features
target = 'price'
features = ['datesold', 'postcode', 'propertyType', 'bedrooms']

X = df[features]
y = df[target]

# Convert 'datesold' to datetime and extract useful features
X['datesold'] = pd.to_datetime(X['datesold'])
X['year'] = X['datesold'].dt.year
X['month'] = X['datesold'].dt.month
X = X.drop('datesold', axis=1)

# One-hot encode categorical column
X = pd.get_dummies(X, columns=['propertyType'], drop_first=True)

# Scale features
scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)

# Train-test split
X_train, X_test, y_train, y_test = train_test_split(
    X_scaled, y, test_size=0.2, random_state=42
)

# Train model
model = RandomForestRegressor(n_estimators=100, random_state=42)
model.fit(X_train, y_train)

# Evaluate
y_pred = model.predict(X_test)
print("R² Score:", r2_score(y_test, y_pred))
print("Mean Squared Error:", mean_squared_error(y_test, y_pred))
```

```
<ipython-input-8-2d032475104e>:27: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#return
  X['datesold'] = pd.to_datetime(X['datesold'])
R² Score: -0.22806619582534382
Mean Squared Error: 75459008443.73859
```

Make Predictions from New Input

```
# Example dictionary (adjust keys to match your actual features)
new_data = {
    'Bedrooms': 3,
    'Bathrooms': 2,
    'SqFt': 1500,
    'Location': 'Downtown',  # Example categorical
    # Add other features as needed...
}
new_df = pd.DataFrame([new_data])
```

Convert to DataFrame and Encode

```
import pandas as pd
import numpy as np
from sklearn.compose import ColumnTransformer
from sklearn.preprocessing import OneHotEncoder, StandardScaler
from sklearn.pipeline import Pipeline
from sklearn.ensemble import RandomForestRegressor
from sklearn.model_selection import train_test_split
from sklearn.metrics import mean_squared_error, r2_score

# Create mock data
np.random.seed(42)
n_samples = 300
df = pd.DataFrame({
    'datesold': pd.date_range(start='2021-01-01', periods=n_samples, freq='D'),
    'postcode': np.random.randint(1000, 9999, n_samples),
    'propertyType': np.random.choice(['House', 'Unit', 'Townhouse'], size=n_samples),
    'bedrooms': np.random.randint(1, 5, n_samples),
    'price': np.random.randint(150000, 1000000, n_samples)
})

# Preprocessing date
df['datesold'] = pd.to_datetime(df['datesold'])
df['year'] = df['datesold'].dt.year
df['month'] = df['datesold'].dt.month
df = df.drop(columns=['datesold'])

# Split features and target
X = df.drop(columns=['price'])
y = df['price']

# Define column types
categorical_cols = ['propertyType']
numerical_cols = ['postcode', 'bedrooms', 'year', 'month']

# Preprocessing pipeline
preprocessor = ColumnTransformer(
    transformers=[
        ('num', StandardScaler(), numerical_cols),
        ('cat', OneHotEncoder(drop='first'), categorical_cols)
    ]
)

# Full pipeline with model
model_pipeline = Pipeline(steps=[
    ('preprocessor', preprocessor),
    ('regressor', RandomForestRegressor(n_estimators=100, random_state=42))
])

# Split and train
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
model_pipeline.fit(X_train, y_train)

# Predict and evaluate
y_pred = model_pipeline.predict(X_test)
print("R² Score:", r2_score(y_test, y_pred))
print("Mean Squared Error:", mean_squared_error(y_test, y_pred))
```

```
R² Score: -0.18492132175595444
Mean Squared Error: 66698791659.67322
```

Predict the Final Price

```
import glob
import os

search_path = os.path.expanduser("")
for file in glob.glob(search_path, recursive=True):
    print(file)
```

Deployment - Building an Interactive App (Gradio)

```
!pip install gradio

import gradio as gr

def predict_price(**kwargs):
    input_df = pd.DataFrame([kwargs])
    input_encoded = pd.get_dummies(input_df)
    input_encoded = input_encoded.reindex(columns=X_encoded.columns, fill_value=0)
    input_scaled = scaler.transform(input_encoded)
    prediction = model.predict(input_scaled)
    return "${:,.2f}".format(prediction[0])
```

```
Requirement already satisfied: gradio in /usr/local/lib/python3.11/dist-packages (5.29.0)
Requirement already satisfied: aiofiles<25.0,>=22.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (24.1
Requirement already satisfied: anyio<5.0,>=3.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (4.9.0)
Requirement already satisfied: fastapi<1.0,>=0.115.2 in /usr/local/lib/python3.11/dist-packages (from gradio) (0.1
Requirement already satisfied: ffmpy in /usr/local/lib/python3.11/dist-packages (from gradio) (0.5.0)
Requirement already satisfied: gradio-client==1.10.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (1.1
Requirement already satisfied: groovy~=0.1 in /usr/local/lib/python3.11/dist-packages (from gradio) (0.1.2)
Requirement already satisfied: httpx>=0.24.1 in /usr/local/lib/python3.11/dist-packages (from gradio) (0.28.1)
Requirement already satisfied: huggingface-hub>=0.28.1 in /usr/local/lib/python3.11/dist-packages (from gradio) (0
Requirement already satisfied: jinja2<4.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (3.1.6)
Requirement already satisfied: markupsafe<4.0,>=2.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (3.0.
Requirement already satisfied: numpy<3.0,>=1.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (2.0.2)
Requirement already satisfied: orjson~=3.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (3.10.18)
Requirement already satisfied: packaging in /usr/local/lib/python3.11/dist-packages (from gradio) (24.2)
Requirement already satisfied: pandas<3.0,>=1.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (2.2.2)
Requirement already satisfied: pillow<12.0,>=8.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (11.2.1)
Requirement already satisfied: pydantic<2.12,>=2.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (2.11.
Requirement already satisfied: pydub in /usr/local/lib/python3.11/dist-packages (from gradio) (0.25.1)
Requirement already satisfied: python-multipart>=0.0.18 in /usr/local/lib/python3.11/dist-packages (from gradio) (
Requirement already satisfied: pyyaml<7.0,>=5.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (6.0.2)
Requirement already satisfied: ruff>=0.9.3 in /usr/local/lib/python3.11/dist-packages (from gradio) (0.11.9)
Requirement already satisfied: safehttpx<0.2.0,>=0.1.6 in /usr/local/lib/python3.11/dist-packages (from gradio) (0
Requirement already satisfied: semantic-version~=2.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (2.1
Requirement already satisfied: starlette<1.0,>=0.40.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (0.
Requirement already satisfied: tomlkit<0.14.0,>=0.12.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (0
Requirement already satisfied: typer<1.0,>=0.12 in /usr/local/lib/python3.11/dist-packages (from gradio) (0.15.3)
Requirement already satisfied: typing-extensions~=4.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (4.
Requirement already satisfied: uvicorn>=0.14.0 in /usr/local/lib/python3.11/dist-packages (from gradio) (0.34.2)
Requirement already satisfied: fsspec in /usr/local/lib/python3.11/dist-packages (from gradio-client==1.10.0->grad
Requirement already satisfied: websockets<16.0,>=10.0 in /usr/local/lib/python3.11/dist-packages (from gradio-clie
Requirement already satisfied: idna>=2.8 in /usr/local/lib/python3.11/dist-packages (from anyio<5.0,>=3.0->gradio)
Requirement already satisfied: sniffio>=1.1 in /usr/local/lib/python3.11/dist-packages (from anyio<5.0,>=3.0->grad
Requirement already satisfied: certifi in /usr/local/lib/python3.11/dist-packages (from httpx>=0.24.1->gradio) (20
Requirement already satisfied: httpcore==1.* in /usr/local/lib/python3.11/dist-packages (from httpx>=0.24.1->gradi
Requirement already satisfied: h11>=0.16 in /usr/local/lib/python3.11/dist-packages (from httpcore==1.*->httpx>=0.
Requirement already satisfied: filelock in /usr/local/lib/python3.11/dist-packages (from huggingface-hub>=0.28.1->
Requirement already satisfied: requests in /usr/local/lib/python3.11/dist-packages (from huggingface-hub>=0.28.1->
Requirement already satisfied: tqdm>=4.42.1 in /usr/local/lib/python3.11/dist-packages (from huggingface-hub>=0.28
Requirement already satisfied: python-dateutil>=2.8.2 in /usr/local/lib/python3.11/dist-packages (from pandas<3.0,
Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.11/dist-packages (from pandas<3.0,>=1.0->gra
Requirement already satisfied: tzdata>=2022.7 in /usr/local/lib/python3.11/dist-packages (from pandas<3.0,>=1.0->g
Requirement already satisfied: annotated-types>=0.6.0 in /usr/local/lib/python3.11/dist-packages (from pydantic<2.
Requirement already satisfied: pydantic-core==2.33.2 in /usr/local/lib/python3.11/dist-packages (from pydantic<2.1
Requirement already satisfied: typing-inspection>=0.4.0 in /usr/local/lib/python3.11/dist-packages (from pydantic<
Requirement already satisfied: click>=8.0.0 in /usr/local/lib/python3.11/dist-packages (from typer<1.0,>=0.12->gra
```

```
Requirement already satisfied: shellingham>=1.3.0 in /usr/local/lib/python3.11/dist-packages (from typer<1.0,>=0.1
Requirement already satisfied: rich>=10.11.0 in /usr/local/lib/python3.11/dist-packages (from typer<1.0,>=0.12->gr
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.11/dist-packages (from python-dateutil>=2.8.2->p
Requirement already satisfied: markdown-it-py>=2.2.0 in /usr/local/lib/python3.11/dist-packages (from rich>=10.11.
Requirement already satisfied: pygments<3.0.0,>=2.13.0 in /usr/local/lib/python3.11/dist-packages (from rich>=10.1
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.11/dist-packages (from requests-
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.11/dist-packages (from requests->huggi
Requirement already satisfied: mdurl~=0.1 in /usr/local/lib/python3.11/dist-packages (from markdown-it-py>=2.2.0->
```

Create a Prediction Function (Gradio UI)

```
import gradio as gr

def predict_price(bedrooms, bathrooms, sqft, location):
    # Dummy prediction logic – replace with your model's prediction
    return f"Predicted price for {bedrooms} BR, {bathrooms} Bath, {sqft} SqFt in {location} is $XXX,XXX"

# Customize input widgets for your specific features
input_fields = [
    gr.Textbox(label="Bedrooms"),
    gr.Textbox(label="Bathrooms"),
    gr.Textbox(label="SqFt"),
    gr.Textbox(label="Location"),  # Example categorical feature
    # Add more fields as per your dataset
]

gr.Interface(fn=predict_price, inputs=input_fields, outputs="text", title="House Price Predictor").launch()
```

```
It looks like you are running Gradio on a hosted a Jupyter notebook. For the Gradio app to work, sharing must be e

Colab notebook detected. To show errors in colab notebook, set debug=True in launch()
* Running on public URL: https://3b7ee0b5a8d13e4832.gradio.live

This share link expires in 1 week. For free permanent hosting and GPU upgrades, run `gradio deploy` from the termi
```