```
from google.colab import drive
drive.mount('/content/drive')
```

```
Drive already mounted at /content/drive; to attempt to forcibly remount, call drive.mount("/content/drive", force_remount=True).
```

```
import pandas as pd

price = pd.read_csv("/content/drive/MyDrive/Datasets/housing.csv")
```

```
price.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 20640 entries, 0 to 20639
Data columns (total 10 columns):
 #   Column              Non-Null Count  Dtype  
---  ------              --------------  -----  
 0   longitude           20640 non-null  float64
 1   latitude            20640 non-null  float64
 2   housing_median_age  20640 non-null  float64
 3   total_rooms         20640 non-null  float64
 4   total_bedrooms      20433 non-null  float64
 5   population          20640 non-null  float64
 6   households          20640 non-null  float64
 7   median_income       20640 non-null  float64
 8   median_house_value  20640 non-null  float64
 9   ocean_proximity     20640 non-null  object 
dtypes: float64(9), object(1)
memory usage: 1.6+ MB
```

```
price.dropna(inplace=True)
```

```
print(price)
```

```
       longitude  latitude  housing_median_age  total_rooms  total_bedrooms  \
0        -122.23     37.88                41.0        880.0           129.0   
1        -122.22     37.86                21.0       7099.0          1106.0   
2        -122.24     37.85                52.0       1467.0           190.0   
3        -122.25     37.85                52.0       1274.0           235.0   
4        -122.25     37.85                52.0       1627.0           280.0   
...          ...       ...                 ...          ...             ...   
20635    -121.09     39.48                25.0       1665.0           374.0   
20636    -121.21     39.49                18.0        697.0           150.0   
20637    -121.22     39.43                17.0       2254.0           485.0   
20638    -121.32     39.43                18.0       1860.0           409.0   
20639    -121.24     39.37                16.0       2785.0           616.0   

       population  households  median_income  median_house_value  \
0           322.0       126.0         8.3252            452600.0   
1          2401.0      1138.0         8.3014            358500.0   
2           496.0       177.0         7.2574            352100.0   
3           558.0       219.0         5.6431            341300.0   
4           565.0       259.0         3.8462            342200.0   
...           ...         ...            ...                 ...   
20635       845.0       330.0         1.5603             78100.0   
20636       356.0       114.0         2.5568             77100.0   
20637      1007.0       433.0         1.7000             92300.0   
20638       741.0       349.0         1.8672             84700.0   
20639      1387.0       530.0         2.3886             89400.0   

      ocean_proximity  
0            NEAR BAY  
1            NEAR BAY  
2            NEAR BAY  
3            NEAR BAY  
4            NEAR BAY  
...               ...  
20635          INLAND  
20636          INLAND  
20637          INLAND  
20638          INLAND  
20639          INLAND  

[20433 rows x 10 columns]
```

```
from sklearn.model_selection import train_test_split

X = price.drop(['median_house_value'], axis=1)
y = price['median_house_value']


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


train_data = X_train.join(y_train)
test_data = X_test.join(y_test)
train_data
```

	longitude	latitude	housing_median_age	total_rooms	total_bedrooms	population
4355	-118.39	34.09	41.0	730.0	126.0	230.0
4209	-118.25	34.11	52.0	125.0	42.0	99.0
17342	-120.40	34.85	26.0	2384.0	385.0	1323.0
4199	-118.24	34.12	34.0	80.0	26.0	125.0
2445	-119.64	36.56	34.0	576.0	117.0	363.0
...	...	...	...	...	...	...
19053	-121.69	38.16	33.0	1808.0	363.0	824.0
20631	-121.40	39.33	15.0	2655.0	493.0	1200.0
18626	-121.95	37.11	21.0	2387.0	357.0	913.0
4377	-118.27	34.09	48.0	1527.0	295.0	589.0
6698	-118.10	34.14	26.0	6262.0	1645.0	3001.0

16346 rows × 10 columns

Next steps: Generate code with train_data View recommended plots

```
train_data.ocean_proximity.value_counts()
```

```
ocean_proximity
<1H OCEAN     7225
INLAND        5180
NEAR OCEAN    2097
NEAR BAY      1841
ISLAND           3
Name: count, dtype: int64
```

```
train_data = train_data.join(pd.get_dummies(train_data.ocean_proximity, dtype=int)).drop(['ocean_proximity'], axis=1)
test_data = test_data.join(pd.get_dummies(test_data.ocean_proximity, dtype=int)).drop(['ocean_proximity'], axis=1)


X_train, y_train = train_data.drop(['median_house_value'], axis=1), train_data['median_house_value']
X_test, y_test = test_data.drop(['median_house_value'], axis=1), test_data['median_house_value']


from sklearn.ensemble import RandomForestRegressor

forest = RandomForestRegressor()
forest.fit(X_train, y_train)
```

```
▾ RandomForestRegressor
RandomForestRegressor()
```

```
forest.score(X_test, y_test)
```

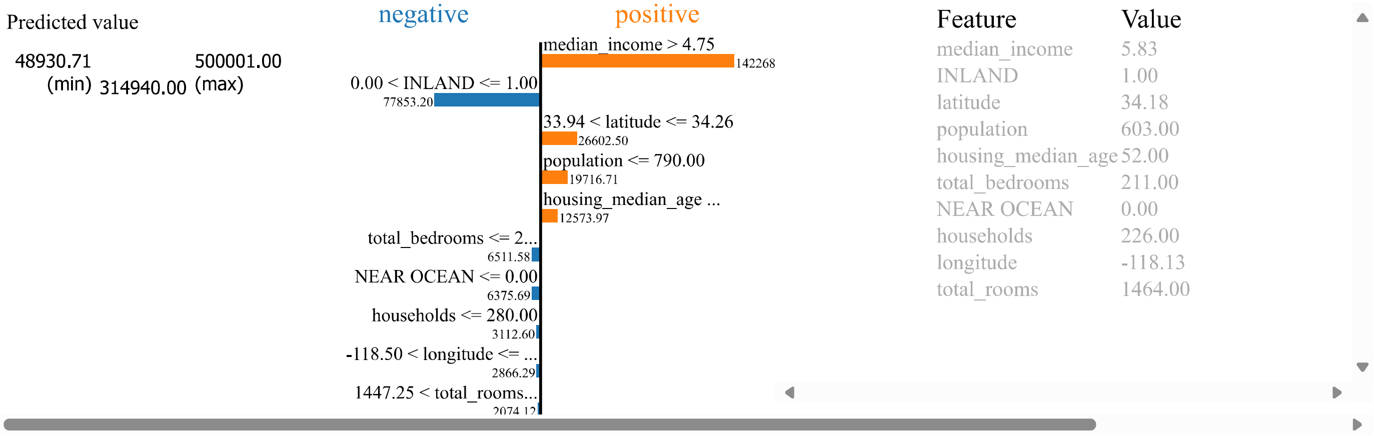
```
0.8228961965688331
```

```
!pip install lime
```

```
Requirement already satisfied: lime in /usr/local/lib/python3.10/dist-packages (0.2.0.1)
Requirement already satisfied: matplotlib in /usr/local/lib/python3.10/dist-packages (from lime) (3.7.1)
Requirement already satisfied: numpy in /usr/local/lib/python3.10/dist-packages (from lime) (1.25.2)
Requirement already satisfied: scipy in /usr/local/lib/python3.10/dist-packages (from lime) (1.11.4)
Requirement already satisfied: tqdm in /usr/local/lib/python3.10/dist-packages (from lime) (4.66.4)
Requirement already satisfied: scikit-learn>=0.18 in /usr/local/lib/python3.10/dist-packages (from lime) (1.2.2)
Requirement already satisfied: scikit-image>=0.12 in /usr/local/lib/python3.10/dist-packages (from lime) (0.19.3)
Requirement already satisfied: networkx>=2.2 in /usr/local/lib/python3.10/dist-packages (from scikit-image>=0.12->lime) (3.3)
Requirement already satisfied: pillow!=7.1.0,!=7.1.1,!=8.3.0,>=6.1.0 in /usr/local/lib/python3.10/dist-packages (from scikit-image>=0.12
Requirement already satisfied: imageio>=2.4.1 in /usr/local/lib/python3.10/dist-packages (from scikit-image>=0.12->lime) (2.31.6)
Requirement already satisfied: tifffile>=2019.7.26 in /usr/local/lib/python3.10/dist-packages (from scikit-image>=0.12->lime) (2024.5.10
Requirement already satisfied: PyWavelets>=1.1.1 in /usr/local/lib/python3.10/dist-packages (from scikit-image>=0.12->lime) (1.6.0)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-packages (from scikit-image>=0.12->lime) (24.0)
Requirement already satisfied: joblib>=1.1.1 in /usr/local/lib/python3.10/dist-packages (from scikit-learn>=0.18->lime) (1.4.2)
Requirement already satisfied: threadpoolctl>=2.0.0 in /usr/local/lib/python3.10/dist-packages (from scikit-learn>=0.18->lime) (3.5.0)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib->lime) (1.2.1)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.10/dist-packages (from matplotlib->lime) (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib->lime) (4.51.0)
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib->lime) (1.4.5)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib->lime) (3.1.2)
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.10/dist-packages (from matplotlib->lime) (2.8.2)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.10/dist-packages (from python-dateutil>=2.7->matplotlib->lime) (1.16.0
```

```
import lime
import lime.lime_tabular

X_train_np = X_train.to_numpy().astype(float)


explainer = lime.lime_tabular.LimeTabularExplainer(X_train_np,
    feature_names=X_train.columns,
    class_names=["median_house_value"],
    mode='regression'
)


exp = explainer.explain_instance(X_test.iloc[0], forest.predict)

exp.show_in_notebook(show_table=True)
```

```
/usr/local/lib/python3.10/dist-packages/sklearn/base.py:439: UserWarning: X does not have valid feature names, but RandomForestRegressor
  warnings.warn(
```



Feature	Value
median_income	5.83
INLAND	1.00
latitude	34.18
population	603.00
housing_median_age	52.00
total_bedrooms	211.00
NEAR OCEAN	0.00
households	226.00
longitude	-118.13
total_rooms	1464.00