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import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.linear_model import LinearRegression
from sklearn.metrics import r2_score
from sklearn.model_selection import train_test_split
from google.colab import drive
drive.mount('/content/drive')
df=pd.read_csv('/content/drive/MyDrive/Housing.csv')
df
df.describe()
df.isnull().sum()
df.columns
def update_column(mainroad):
  if mainroad == 'yes':
     mainroad = 1
     return mainroad
  elif mainroad == 'no':
    mainroad = 0
    return mainroad
  else :
    mainroad = 10
    return mainroad
df['mainroad'] = df['mainroad'].apply(update_column)
def update_column(guestroom):
  if guestroom == 'yes':
     guestroom = 1
     return guestroom
  elif guestroom == 'no':
    guestroom = 0
    return guestroom
  else :
    guestroom = 10
    return guestroom
df['guestroom'] = df['guestroom'].apply(update_column)
def update_column(basement):
  if basement == 'yes':
     basement = 1
     return basement
  elif basement == 'no':
    basement = 0
    return basement
  else :
    basement = 10
    return basement
df['basement'] = df['basement'].apply(update_column)
def update_column(hotwaterheating):
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  if hotwaterheating == 'yes':
     hotwaterheating = 1
     return hotwaterheating
  elif hotwaterheating == 'no':
    hotwaterheating = 0
    return hotwaterheating
  else :
    hotwaterheating = 10
    return hotwaterheating
df['hotwaterheating'] = df['hotwaterheating'].apply(update_column)
def update_column(airconditioning):
  if airconditioning == 'yes':
     airconditioning = 1
     return airconditioning
  elif airconditioning == 'no':
    airconditioning = 0
    return airconditioning
  else :
    airconditioning = 10
    return airconditioning
df['airconditioning'] = df['airconditioning'].apply(update_column)
def update_column(prefarea):
  if prefarea == 'yes':
     prefarea = 1
     return prefarea
  elif prefarea == 'no':
    prefarea = 0
    return prefarea
  else :
    prefarea = 10
    return prefarea
df['prefarea'] = df['prefarea'].apply(update_column)
def update_column(furnishingstatus):
  if furnishingstatus == 'furnished':
     furnishingstatus = 1
     return furnishingstatus
  elif furnishingstatus == 'semi-furnished':
    furnishingstatus = 0
    return furnishingstatus
  elif furnishingstatus == 'unfurnished':
    furnishingstatus = -1
    return furnishingstatus
  else :
    furnishingstatus = 10
    return furnishingstatus
df['furnishingstatus'] = df['furnishingstatus'].apply(update_column)
df
model=LinearRegression()
```

```
x=df.drop(['price'],axis=1).values
y=df.price
df.ndim
x.ndim
x
y
x_train, x_test, y_train, y_test = train_test_split(x,y,test_size=0.2)
len(x_train)
len(x_test)
len(y_train)
len(y_test)
model.fit(x_train, y_train)
model.intercept_
model.coef_
y_pred = model.predict(x_test)
r2_score(y_test, y_pred)
```