```
In [2]:
         import pandas as pd
         import numpy as np
         import matplotlib.pyplot as plt
         import seaborn as sns
         data = pd.read_csv("housing.csv")
In [3]:
In [4]:
         data
Out[4]:
                longitude latitude housing_median_age total_rooms total_bedrooms population housel
             0
                  -122.23
                            37.88
                                                 41.0
                                                            0.088
                                                                           129.0
                                                                                      322.0
             1
                  -122.22
                            37.86
                                                 21.0
                                                                                     2401.0
                                                           7099.0
                                                                          1106.0
             2
                                                 52.0
                  -122.24
                            37.85
                                                           1467.0
                                                                           190.0
                                                                                      496.0
             3
                  -122.25
                            37.85
                                                 52.0
                                                           1274.0
                                                                           235.0
                                                                                      558.0
             4
                                                 52.0
                                                                           280.0
                                                                                      565.0
                  -122.25
                            37.85
                                                           1627.0
         20635
                  -121.09
                            39.48
                                                 25.0
                                                           1665.0
                                                                           374.0
                                                                                      845.0
         20636
                  -121.21
                            39.49
                                                 18.0
                                                            697.0
                                                                           150.0
                                                                                      356.0
         20637
                  -121.22
                            39.43
                                                 17.0
                                                           2254.0
                                                                           485.0
                                                                                     1007.0
         20638
                  -121.32
                            39.43
                                                 18.0
                                                           1860.0
                                                                           409.0
                                                                                      741.0
         20639
                  -121.24
                            39.37
                                                 16.0
                                                           2785.0
                                                                           616.0
                                                                                     1387.0
        20640 rows × 10 columns
In [5]: data.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
              housing_median_age 20640 non-null float64
          2
                                    20640 non-null float64
          3
              total rooms
              total bedrooms
                                    20433 non-null float64
          5
              population
                                    20640 non-null float64
                                    20640 non-null float64
              households
              median income
                                    20640 non-null float64
          7
              median_house_value 20640 non-null float64
                                    20640 non-null object
          9
              ocean_proximity
         dtypes: float64(9), object(1)
         memory usage: 1.6+ MB
         data.dropna(inplace = True)
In [6]:
         data.info()
In [7]:
```

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2/23/23, 1:42 AM

```
Untitled
          <class 'pandas.core.frame.DataFrame'>
          Int64Index: 20433 entries, 0 to 20639
          Data columns (total 10 columns):
           #
               Column
                                     Non-Null Count Dtype
          ---
               ----
                                     -----
           0
               longitude
                                     20433 non-null float64
           1
               latitude
                                     20433 non-null float64
               housing_median_age 20433 non-null float64
           3
               total_rooms
                                     20433 non-null float64
               total_bedrooms
                                     20433 non-null float64
           4
           5
               population
                                     20433 non-null float64
               households
                                     20433 non-null float64
           6
           7
               median_income
                                     20433 non-null float64
               median_house_value 20433 non-null float64
           9
               ocean_proximity
                                     20433 non-null object
          dtypes: float64(9), object(1)
          memory usage: 1.7+ MB
In [12]: from sklearn.model_selection import train_test_split
          X = data.drop(['median_house_value'], axis = 1)
          y = data['median_house_value']
 In [9]:
                 longitude latitude housing_median_age total_rooms total_bedrooms population housel
 Out[9]:
              0
                   -122.23
                             37.88
                                                  41.0
                                                             0.088
                                                                            129.0
                                                                                       322.0
                   -122.22
                             37.86
                                                  21.0
                                                            7099.0
                                                                           1106.0
                                                                                       2401.0
              2
                   -122.24
                             37.85
                                                  52.0
                                                            1467.0
                                                                            190.0
                                                                                       496.0
                   -122.25
                             37.85
                                                  52.0
                                                            1274.0
                                                                            235.0
                                                                                       558.0
              4
                   -122.25
                             37.85
                                                  52.0
                                                            1627.0
                                                                            280.0
                                                                                       565.0
          20635
                   -121.09
                             39.48
                                                  25.0
                                                            1665.0
                                                                            374.0
                                                                                       845.0
                                                  18.0
          20636
                   -121.21
                             39.49
                                                                            150.0
                                                                                       356.0
                                                             697.0
          20637
                   -121.22
                             39.43
                                                  17.0
                                                            2254.0
                                                                            485.0
                                                                                       1007.0
                                                  18.0
          20638
                   -121.32
                             39.43
                                                            1860.0
                                                                            409.0
                                                                                       741.0
          20639
                   -121.24
                             39.37
                                                  16.0
                                                            2785.0
                                                                            616.0
                                                                                       1387.0
         20433 rows × 9 columns
```

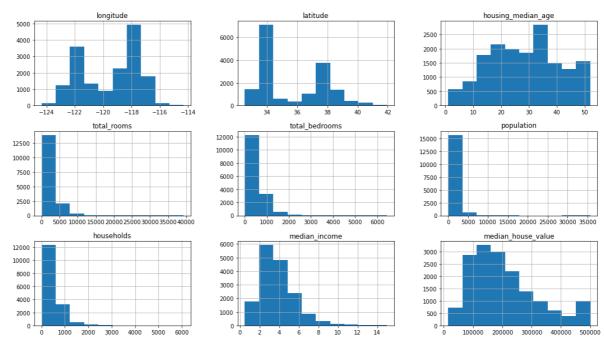
```
In [13]: y
```

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452600.0

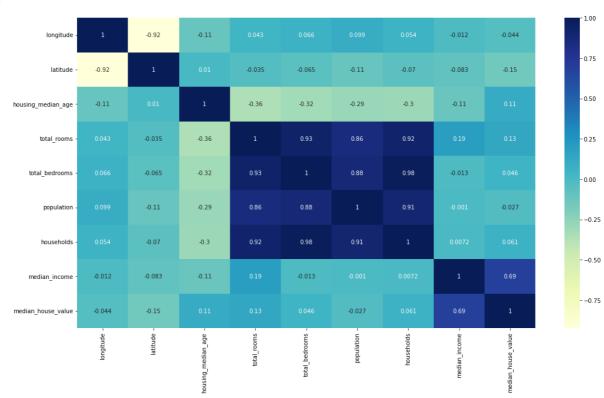
```
Out[13]:
          1
                     358500.0
          2
                     352100.0
          3
                     341300.0
          4
                     342200.0
                       . . .
          20635
                      78100.0
           20636
                      77100.0
           20637
                      92300.0
           20638
                      84700.0
           20639
                      89400.0
          Name: median_house_value, Length: 20433, dtype: float64
          X_train,X_test,y_train,y_test = train_test_split(X,y,test_size = 0.2)
In [14]:
           train_data = X_train.join(y_train)
In [15]:
In [16]:
           train_data
                  longitude latitude housing_median_age total_rooms total_bedrooms population housel
Out[16]:
            5753
                    -118.27
                               34.18
                                                    52.0
                                                               3034.0
                                                                                406.0
                                                                                           1158.0
           19035
                    -121.98
                               38.36
                                                    24.0
                                                               2434.0
                                                                                630.0
                                                                                           1538.0
            4812
                    -118.37
                               34.02
                                                    44.0
                                                                                458.0
                                                               1944.0
                                                                                            981.0
            4517
                    -118.20
                               34.04
                                                    44.0
                                                               1399.0
                                                                                386.0
                                                                                           1419.0
           17676
                                                    14.0
                                                                               1538.0
                                                                                          3979.0
                    -121.84
                               37.32
                                                               5762.0
           15225
                    -117.26
                               33.06
                                                    11.0
                                                               2660.0
                                                                                352.0
                                                                                           1226.0
            2988
                    -119.02
                                                                                412.0
                               35.33
                                                    35.0
                                                               2053.0
                                                                                           1193.0
           16652
                    -120.66
                               35.28
                                                    31.0
                                                               2773.0
                                                                                844.0
                                                                                           1358.0
           11300
                               33.77
                                                    28.0
                                                               3614.0
                                                                                960.0
                                                                                          3282.0
                    -117.92
           20071
                    -120.38
                               37.99
                                                    36.0
                                                               2864.0
                                                                                603.0
                                                                                           1155.0
          16346 \text{ rows} \times 10 \text{ columns}
           train_data.hist(figsize = (18,10))
In [17]:
          array([[<AxesSubplot:title={'center':'longitude'}>,
Out[17]:
                    <AxesSubplot:title={'center':'latitude'}>,
                    <AxesSubplot:title={'center':'housing_median_age'}>],
                  [<AxesSubplot:title={'center':'total_rooms'}>,
                    <AxesSubplot:title={'center':'total_bedrooms'}>,
                    <AxesSubplot:title={'center':'population'}>],
                   [<AxesSubplot:title={'center':'households'}>,
                    <AxesSubplot:title={'center':'median_income'}>,
                    <AxesSubplot:title={'center':'median_house_value'}>]],
                 dtype=object)
```

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```
In [18]: plt.figure(figsize = (18,10))
    sns.heatmap(train_data.corr(), annot = True, cmap = "YlGnBu")
```

Out[18]: <AxesSubplot:>



```
In [19]: train_data['total_rooms'] = np.log(train_data['total_rooms'] + 1)
    train_data['total_bedrooms'] = np.log(train_data['total_bedrooms'] + 1)
    train_data['population'] = np.log(train_data['population'] + 1)
    train_data['households'] = np.log(train_data['households'] + 1)
```

```
In [20]: train_data.hist(figsize=(18,10))
```

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```
array([[<AxesSubplot:title={'center':'longitude'}>,
Out[20]:
                      <AxesSubplot:title={'center':'latitude'}>,
                      <AxesSubplot:title={'center':'housing_median_age'}>],
                     [<AxesSubplot:title={'center':'total_rooms'}>,
                      <AxesSubplot:title={'center':'total_bedrooms'}>,
                      <AxesSubplot:title={'center':'population'}>],
                     [<AxesSubplot:title={'center':'households'}>,
                      <AxesSubplot:title={'center':'median_income'}>,
                      <AxesSubplot:title={'center':'median_house_value'}>]],
                   dtype=object)
                          longitude
                                                               latitude
                                                                                               housing_median_age
                                                                                    2500
                                                6000
            4000
                                                                                    2000
            3000
                                                                                    1500
            2000
                                                                                    1000
            1000
                                                                                     500
                -124
                     -122
                         -120
                              -118
                                    -116
                                                                   38
                                                                                                      30
                                                                                                  population
                         total rooms
                                                             total bedrooms
                                                8000
                                                                                    8000
            6000
                                                                                    6000
            4000
                                                4000
                                                                                    4000
                                                2000
                                                                                    2000
                          households
                                                                                               median_house_value
                                                            median_income
            8000
                                                                                    3000
                                                                                    2500
            6000
                                                4000
            4000
                                                3000
                                                                                    1500
                                                                                    1000
                                                1000
```

In [21]: train_data.join(pd.get_dummies(train_data.ocean_proximity))

Out[21]:	longitude	latitude	housing_median_age	total_rooms	total_bedrooms	population	housel
----------	-----------	----------	--------------------	-------------	----------------	------------	--------

		iongitude	iatituue	nousing_median_age	total_rooms	total_bearoons	population	ilousei
	5753	-118.27	34.18	52.0	8.017967	6.008813	7.055313	5.99
	19035	-121.98	38.36	24.0	7.797702	6.447306	7.338888	6.35
	4812	-118.37	34.02	44.0	7.573017	6.129050	6.889591	5.93
	4517	-118.20	34.04	44.0	7.244228	5.958425	7.258412	5.92
	17676	-121.84	37.32	14.0	8.659213	7.338888	8.289037	7.23
	•••							
	15225	-117.26	33.06	11.0	7.886457	5.866468	7.112327	5.90
	2988	-119.02	35.33	35.0	7.627544	6.023448	7.085064	5.96
	16652	-120.66	35.28	31.0	7.928046	6.739337	7.214504	6.67
	11300	-117.92	33.77	28.0	8.192847	6.867974	8.096513	6.79
	20071	-120.38	37.99	36.0	7.960324	6.403574	7.052721	6.33

16346 rows × 15 columns

```
In [22]: train_data = train_data.join(pd.get_dummies(train_data.ocean_proximity)).drop(['ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean_data.ocean
```

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```
plt.figure(figsize = (18,10))
In [23]:
             sns.heatmap(train_data.corr(), annot = True, cmap = "YlGnBu")
             <AxesSubplot:>
Out[23]:
                                                                                                                           1.00
                                 -0.92
                                        -0.11
                                                                       -0.012
                                                                              -0.044
                                                                                          -0.059
                           -0.92
                                              -0.034
                                                    -0.068
                                                           -0.14
                                                                       -0.083
                                                                                    -0.45
                                                                                                 -0.017
                                                                                                             -0.16
                                                                                                                           0.75
             housing_median_age
                                                                                          -0.017
                                                                                                       -0.019
                  total_rooms
                                                                                                                           - 0.50
                                                                       -0.033
                                                                       -0.011
                                                                                          -0.074
                                                                                                             -0.011
                                                                                                                           - 0.25
                                                                                           -0.09
                                                                                                       -0.0082
                                                                                                                           -0.00
                                 -0.083
                                        -0.11
                                                                                          -0.24
             median_house_value
                           -0.044
                                 -0.15
                                                           -0.02
                                                                                          -0.49
                                                                                                                            -0.25
                                 -0.45
                  <1H OCEAN
                                                                                          -0.61
                                                                                                       -0.31
                                                                                                             -0.34
                    INLAND
                           -0.059
                                        -0.24
                                              -0.017
                                                    -0.048
                                                           -0.074
                                                                 -0.09
                                                                       -0.24
                                                                              -0.49
                                                                                    -0.61
                                                                                                       -0.24
                                                                                                             -0.26
                    ISLAND
                           -0.47
                                                                                          -0.24
                                                                                                             -0.13
                   NEAR BAY
                                              -0.019
                                                           -0.062
                                                                                    -0.31
                 NEAR OCEAN
                                 -0.16
                                                           -0.011
                                                                                    -0.34
                                                                                          -0.26
                                                                                                       -0.13
In [24]:
             plt.figure(figsize=(18,10))
             sns.scatterplot(x = "latitude", y = "longitude", data = train_data, hue = "median_l
             <AxesSubplot:xlabel='latitude', ylabel='longitude'>
Out[24]:
              -114
                                                                                                                        100000
              -116
              -118
              -120
              -122
             train_data['bedroom_ratio'] = train_data['total_bedrooms'] / train_data['total_room

In [25]:
             train data['household rooms'] = train data['total rooms'] / train data['households
In [26]:
             plt.figure(figsize = (18,10))
             sns.heatmap(train_data.corr(), annot = True, cmap = "YlGnBu")
             <AxesSubplot:>
Out[26]:
```

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```
-0.92
                                                                                                 -0.11
                                                                                                                                                                                                                                                 -0.47
                                                                                                                                                                                                                                                                                            -0.069
                                                  longitude
                                                                                                                                                                                        -0.044
                                                                                                                                                                                                                    -0.059
                                                    latitude
                                                                     -0.92
                                                                                                                -0.034
                                                                                                                             -0.068
                                                                                                                                             -0 14
                                                                                                                                                            -0.09
                                                                                                                                                                         -0.083
                                                                                                                                                                                        -0.15
                                                                                                                                                                                                      -0.45
                                                                                                                                                                                                                                  -0.017
                                                                                                                                                                                                                                                               -0.16
                                                                                                                                                                                                                                                                              -0 11
                                                                                                                                                                                                                                                                                                                               - 0.75
                                                                                                                -0.31
                                                                                                                              -0.27
                                                                                                                                             JO 24
                                                                                                                                                           -0.24
                                                                                                                                                                         -0.11
                                                                                                                                                                                                                     -0.24
                                                                                                                                                                                                                                                                                             -0.04
                                 housing_median_age
                                                                                   -0.034
                                                                                                  -0.31
                                                                                                                                             0.86
                                                                                                                                                                                                                                                 -0.019
                                               total roo
                                                                                                                                                                                                                                                                                                                              - 0.50
                                                                                                  -0.27
                                                                                                                                                                                                                                                 -0.02
                                                                                   -0.068
                                                                                                                                                                                                                                                                               0.68
                                                                                                                                                                                                                                                                                             -0.55
                                          total bedrooms
                                                                                                                0.86
                                                                                                                                                                                                                    -0.074
                                                 population
                                                                                   -0.14
                                                                                                  -0.24
                                                                                                                                                                                                                                                 -0.062
                                                                                                                                                                                                                                                               -0.011
                                                                                                                                                                                                                                                                                             -0.63
                                                                                                                                                                                                                                                                                                                              - 0.25
                                               households
                                                                                    -0.09
                                                                                                  -0.24
                                                                                                                0.93
                                                                                                                                                                                                                     -0.09
                                                                                                                                                                                                                                                -0.0082
                                                                                                                                                                                                                                                                              0.64
                                                                                                                                                                                                                                                                                             -0.66
                                                                                                  -0.11
                                                                                                                             -0.033
                                                                                                                                            -0.011
                                                                                                                                                                                                                     -0.24
                                                                                                                                                                                                                                                                              -0.51
                                         median_income
                                                                                   -0.083
                                                                                                                                                                                                                                                                                                                               0.00
                                  median_house_value
                                              <1H OCEAN
                                                                                                                                                                                                                                                 -0.31
                                                                                                                                                                                                                                                                -0.34
                                                                                                                                                                                                                                                                                             -0.13
                                                                                                                                                                                                                                                                                                                               -0.25
                                                                                                  -0.24
                                                                                                               -0.017
                                                                                                                             -0.048
                                                                                                                                            -0.074
                                                                                                                                                            -0.09
                                                                                                                                                                         -0.24
                                                                                                                                                                                        -0.49
                                                                                                                                                                                                       -0.61
                                                                                                                                                                                                                                                  -0.24
                                                                                                                                                                                                                                                                -0.26
                                                                                                                                                                                                                                                                               -0.1
                                                     INLAND
                                                     ISLAND
                                                                                   -0.017
                                                                                                                                            -0.011
                                                                                                                                                                         -0.009
                                                                                                                                                                                                      -0.014
                                                                                                                                                                                                                    -0.011
                                                 NEAR BAY
                                                                     -0.47
                                                                                                                               -0.02
                                                                                                                                            -0.062
                                                                                                                                                          -0.0082
                                                                                                                                                                                                       -0.31
                                                                                                                                                                                                                     -0.24
                                                                                                                                                                                                                                                                -0.13
                                                                                                                                                                                                                                                                              -0.014
                                                                                                                                                                                                                                                                                                                               -0.50
                                                                                    -0.16
                                                                                                                                                                                                       -0.34
                                                                                                                                                                                                                     -0.26
                                                                                                                                                                                                                                                  -0.13
                                             NEAR OCEAN
                                                                                                                                                                                                                                                                                            -0.043
                                                                                                 -0.036
                                                                                                                                                                                         -0.2
                                           bedroom_ratio
                                                                                                                                                                                                                                                                                                                              - -0.75
                                                                                                                                                                                                       -0.13
                                                                    -0.069
                                                                                                  -0.04
                                                                                                                -0.38
                                                                                                                                                                                                                                                               -0.043
                                                                                                                                                                                                                                                                              -0.75
                                       household_rooms
                                                                                                                              -0.55
                                                                                                                                             -0.63
                                                                                                                                                           -0.66
                                                                                                                                                                                                        <1H OCEAN
                                  from sklearn.linear_model import LinearRegression
In [27]:
                                  from sklearn.preprocessing import StandardScaler
                                  scaler = StandardScaler()
                                  X_train, y_train = train_data.drop(['median_house_value'], axis = 1), train_data['interpretation | x_train_data | x_train
                                  X_train_s = scaler.fit_transform(X_train)
                                  reg = LinearRegression()
                                  reg.fit(X_train_s, y_train)
                                  LinearRegression()
Out[27]:
                                  test_data = X_test.join(y_test)
                                  test_data['total_rooms'] = np.log(test_data['total_rooms'] + 1)
                                  test_data['total_bedrooms'] = np.log(test_data['total_bedrooms'] + 1)
                                  test_data['population'] = np.log(test_data['population'] + 1)
                                  test_data['households'] = np.log(test_data['households'] + 1)
```

```
In [28]:
          test_data = test_data.join(pd.get_dummies(test_data.ocean_proximity)).drop(['ocean]
          test_data['bedroom_ratio'] = test_data['total_bedrooms'] / test_data['total_rooms'
          test_data['household_rooms'] = test_data['total_rooms'] / test_data['households']
          X_test, y_test = test_data.drop(['median_house_value'], axis = 1), test_data['median_house_value']
In [29]:
          X_test_s = scaler.transform(X_test)
In [30]:
In [31]:
          X_train
```

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		longitude	latitude	housing_median_age	total_rooms	total_bedrooms	population	housel
	5753	-118.27	34.18	52.0	8.017967	6.008813	7.055313	5.99
	19035	-121.98	38.36	24.0	7.797702	6.447306	7.338888	6.35
	4812	-118.37	34.02	44.0	7.573017	6.129050	6.889591	5.93
	4517	-118.20	34.04	44.0	7.244228	5.958425	7.258412	5.92
	17676	-121.84	37.32	14.0	8.659213	7.338888	8.289037	7.23
	•••							
	15225	-117.26	33.06	11.0	7.886457	5.866468	7.112327	5.90
	2988	-119.02	35.33	35.0	7.627544	6.023448	7.085064	5.96
	16652	-120.66	35.28	31.0	7.928046	6.739337	7.214504	6.67
	11300	-117.92	33.77	28.0	8.192847	6.867974	8.096513	6.79
	20071	-120.38	37.99	36.0	7.960324	6.403574	7.052721	6.33

16346 rows × 15 columns

In [32]: X_test

Out[31]:

Out[32]:		longitude	latitude	housing_median_age	total_rooms	total_bedrooms	population	housel
	20013	-119.01	36.02	17.0	8.272826	6.610696	7.478170	6.53
	3225	-119.66	36.30	18.0	7.045777	5.313206	6.576470	5.36
	8520	-118.33	33.90	21.0	8.795431	7.593374	8.621013	7.46
	17338	-120.45	34.87	4.0	7.335634	5.402677	6.302619	5.25
	5800	-118.24	34.15	7.0	7.632401	6.508769	7.545918	6.46
	•••							
	19508	-121.05	37.62	37.0	6.950815	5.283204	6.320768	5.28
	4697	-118.37	34.07	52.0	6.989335	5.513429	6.150603	5.54
	16824	-122.49	37.63	31.0	8.042378	6.432940	7.295056	6.42
	8626	-118.39	33.88	34.0	7.587817	5.908083	6.738152	5.84
	1963	-120.58	38.77	15.0	7.676010	5.978886	6.754604	5.87

4087 rows × 15 columns

```
→
```

In [34]: reg.score(X_test_s, y_test)

Out[34]: 0.6620549129177645

In [35]: from sklearn.ensemble import RandomForestRegressor
forest = RandomForestRegressor()

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```
forest.fit(X_train, y_train)
         RandomForestRegressor()
Out[35]:
         forest.score(X_test, y_test)
In [36]:
         0.8029273594609136
Out[36]:
In [43]:
         from sklearn.model_selection import GridSearchCV
         param_grid = {
            "n_estimators": [100, 200, 300],
            "min_samples_split": [2, 4],
            "max_depth": [None, 4, 8]
         grid_search = GridSearchCV(forest, param_grid, cv = 5,
                                   scoring = "neg_mean_squared_error",
                                  return_train_score = True)
         grid_search.fit(X_train, y_train)
        GridSearchCV(cv=5, estimator=RandomForestRegressor(),
Out[43]:
                     return_train_score=True, scoring='neg_mean_squared_error')
In [45]:
         grid_search.best_estimator_
         RandomForestRegressor(n_estimators=300)
Out[45]:
In [46]:
         grid_search.best_estimator_.score(X_test,y_test)
        0.805869618797127
Out[46]:
```

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