AnalysisHousing

```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
import folium
from folium.plugins import HeatMap

import warnings
# Adding this because a few of the things we learned in sns will be changed or␣
 ↪removed in the future, it adds a lot of cautions.
warnings.filterwarnings("ignore", category=FutureWarning, module="seaborn.
 ↪_oldcore")
```

```
df = pd.read_excel("/Users/anders/Documents/Skillshare/housing.xlsx")
df.head()
```

```
   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

   population  households  median_income  median_house_value ocean_proximity
0       322.0       126.0         8.3252            452600.0        NEAR BAY
1      2401.0      1138.0         8.3014            358500.0        NEAR BAY
2       496.0       177.0         7.2574            352100.0        NEAR BAY
3       558.0       219.0         5.6431            341300.0        NEAR BAY
4       565.0       259.0         3.8462            342200.0        NEAR BAY
```

```
#Checking how many datapoints there are in the dataset and the spread of␣
 ↪"categories" on ocean_proximity
num_datapoints = df.shape[0]
print(f"The dataset contains {num_datapoints} datapoints.")

df["ocean_proximity"].value_counts()
```

```
The dataset contains 20640 datapoints.
```

```
ocean_proximity
<1H OCEAN     9136
INLAND        6551
NEAR OCEAN    2658
NEAR BAY      2289
ISLAND           5
NEAR BAY}        1
Name: count, dtype: int64
```

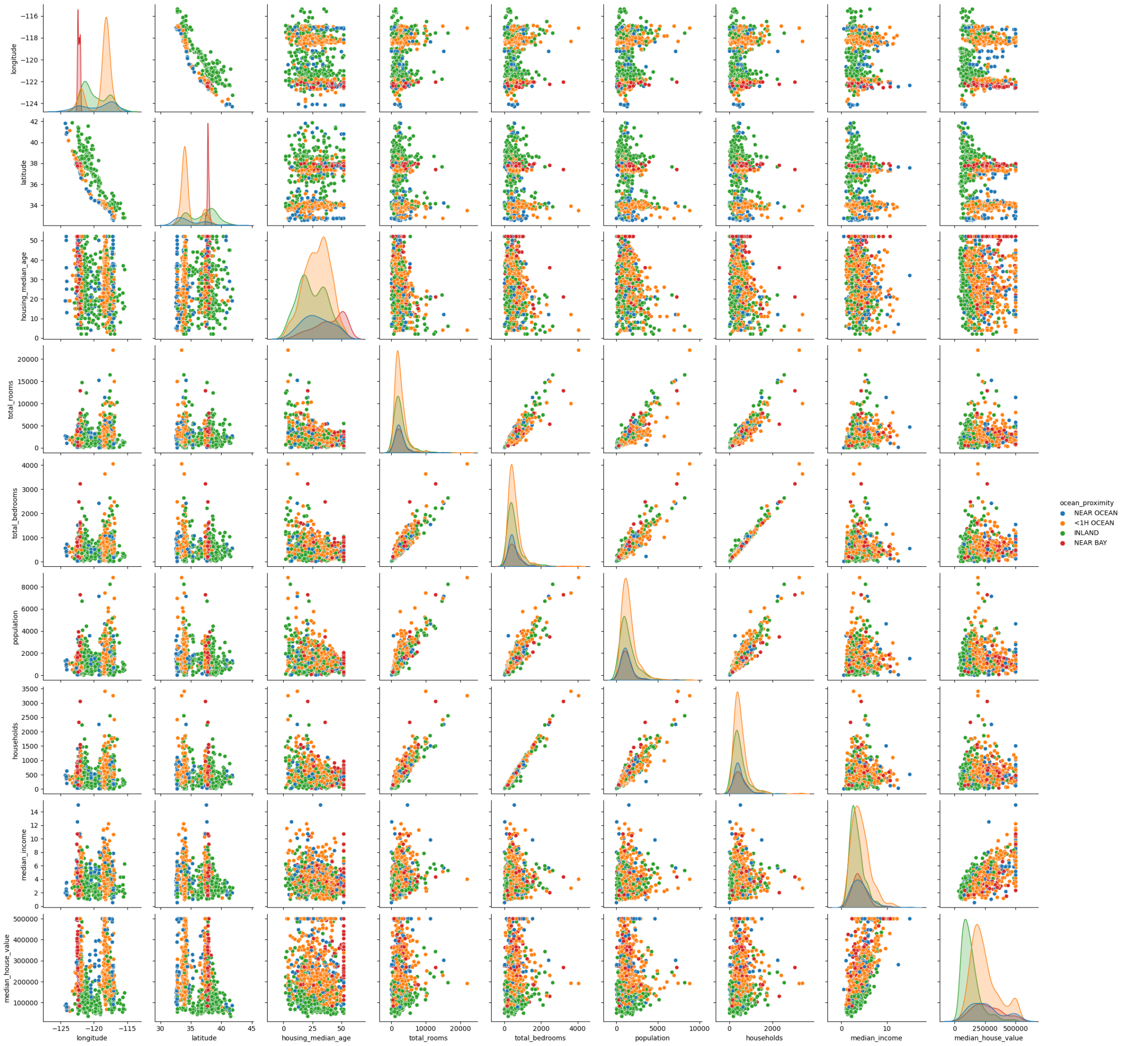
```
# I see that a } had sneaked into the CSV/Excel file.
# The error was "NEAR BAY}"
# Because I was going to use this dataset a lot I later went in and manually␣
 ↪removed it
# from the file with a simple search and replace in Excel.
```

```
df["ocean_proximity"] = df["ocean_proximity"].str.strip("}")
df["ocean_proximity"].value_counts()
```

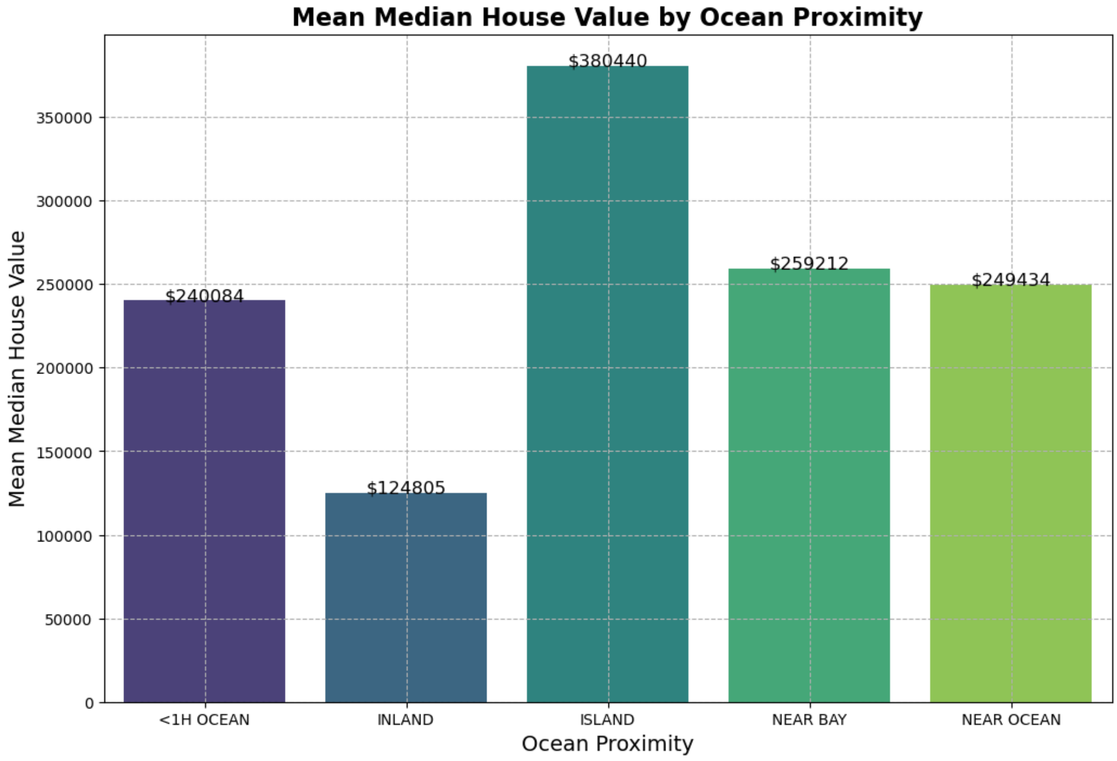
```
ocean_proximity
<1H OCEAN     9136
INLAND        6551
NEAR OCEAN    2658
NEAR BAY      2290
ISLAND           5
Name: count, dtype: int64
```

```
sns.pairplot(df.sample(1000), hue="ocean_proximity")
```

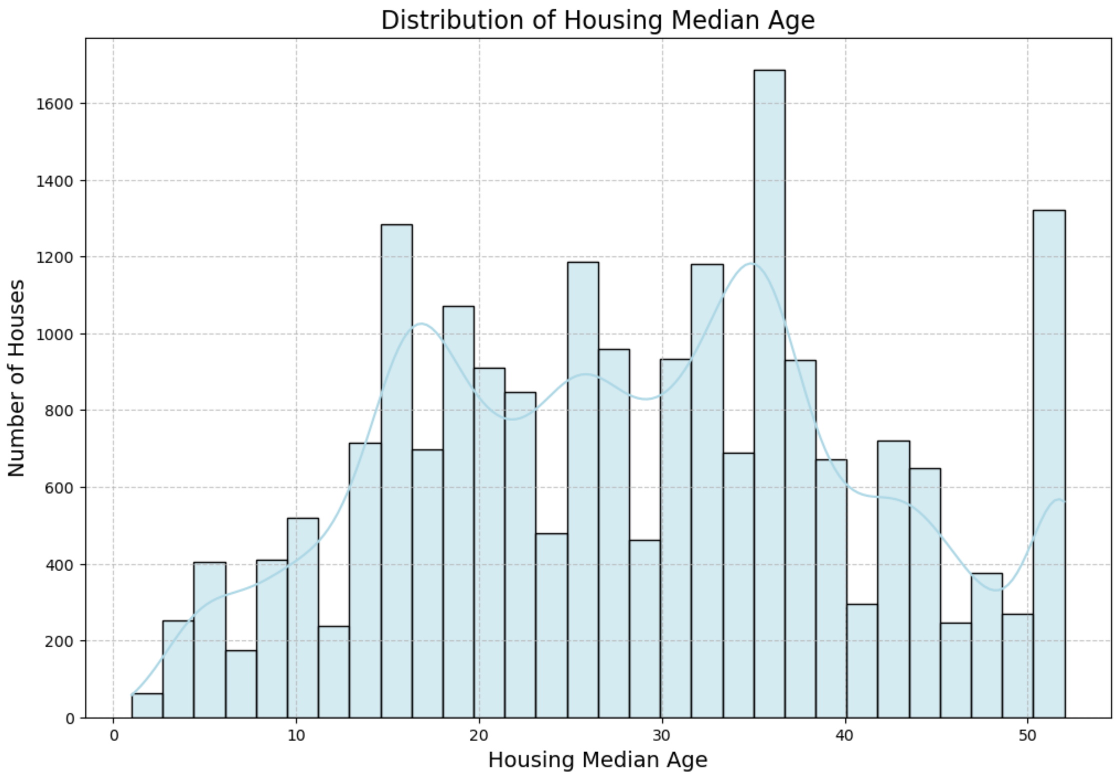
```
<seaborn.axisgrid.PairGrid at 0x1803a3cd0>
```



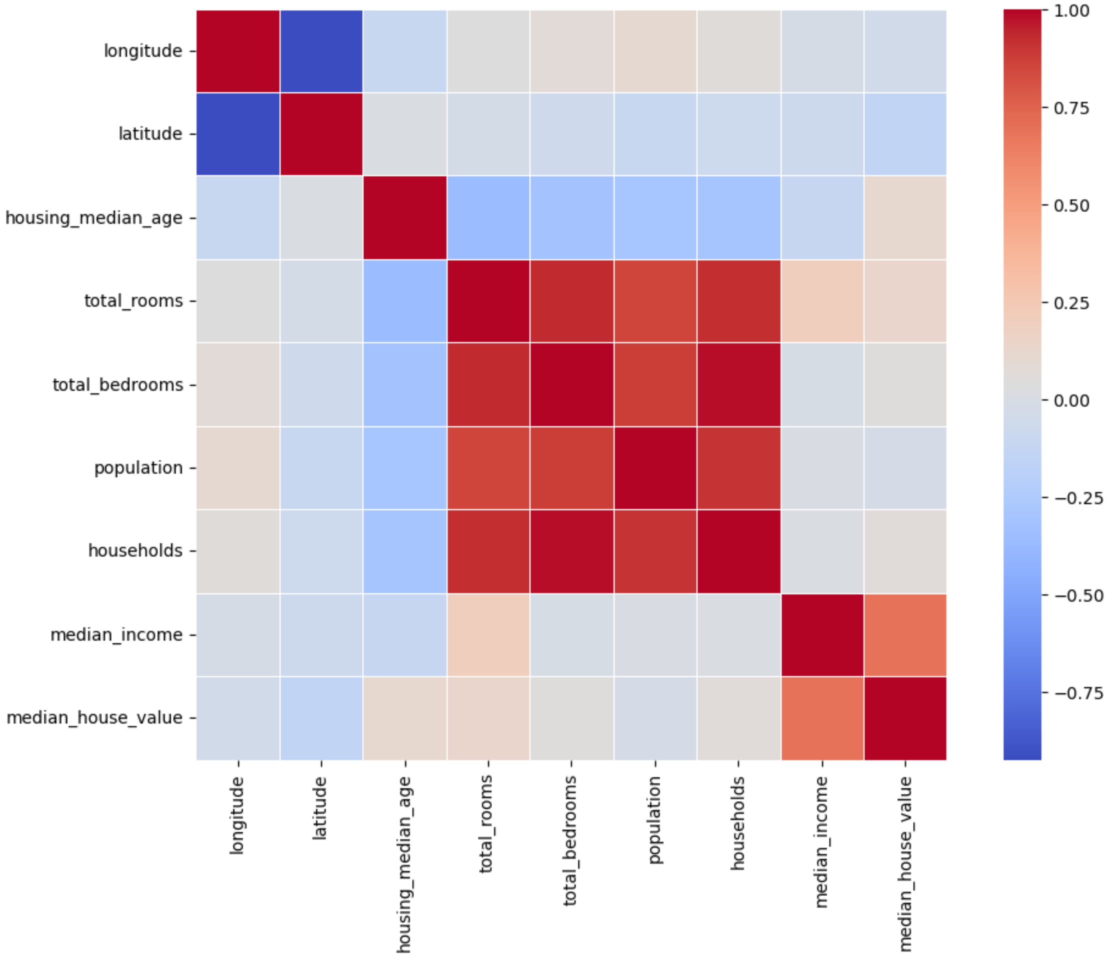
```python
mean_values = df.groupby("ocean_proximity")["median_house_value"].mean().reset_index()

plt.figure(figsize=(12, 8))
sns.barplot(x="ocean_proximity", y="median_house_value", data=mean_values, palette="viridis")
plt.title("Mean Median House Value by Ocean Proximity", fontsize=16, fontweight="bold")
plt.xlabel("Ocean Proximity", fontsize=14)
plt.ylabel("Mean Median House Value", fontsize=14)

for index, row in mean_values.iterrows():
    plt.text(index, row['median_house_value'], f'${row["median_house_value"]:.0f}', color='black', ha="center", fontsize=12)
plt.grid(True, linestyle="--")
plt.show()
```



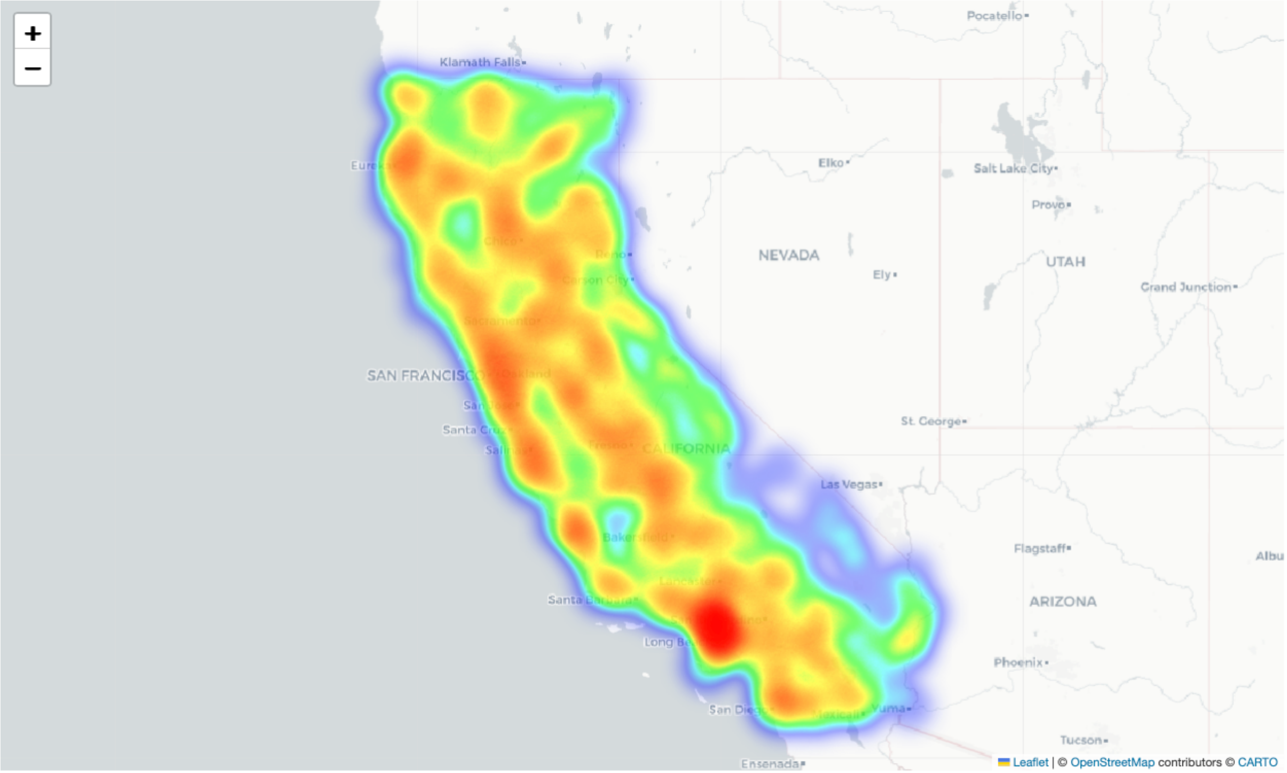
```
plt.figure(figsize=(12, 8))
sns.histplot(df['housing_median_age'], bins=30, kde=True, color='lightblue')


plt.title('Distribution of Housing Median Age', fontsize=16)
plt.xlabel('Housing Median Age', fontsize=14)
plt.ylabel('Number of Houses', fontsize=14)

plt.grid(True, linestyle='--', alpha=0.7)


plt.show()
```



```
# Select only numeric columns for correlation
numeric_df = df.select_dtypes(include=["number"])
corr_matrix_numeric = numeric_df.corr()
plt.figure(figsize=(12, 8))
sns.heatmap(corr_matrix_numeric, cmap="coolwarm", linewidths=0.5, square=True)
plt.show()
```



```
latitude_mean = df.latitude.mean()
longitude_mean = df.longitude.mean()

#Had to use -4 and +12 to get the formatting correct when converting to pdf.
m = folium.Map(location=[latitude_mean -4, longitude_mean+12],
               zoom_start=5, tiles="CartoDB Positron")

#Normally i would have used this
#m = folium.Map(location=[latitude_mean +2, longitude_mean], zoom_start=6,␣
 ↪tiles="CartoDB Positron")

heat_data = [[row['latitude'], row['longitude']] for index, row in df.
 ↪iterrows()]
HeatMap(heat_data, min_opacity=0.4, radius=20).add_to(m)
m
```



+
−
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Pocatello
Eureka
Elko
Salt Lake City
Provo
Chico
Reno
NEVADA
Ely
UTAH
Carson City
Grand Junction
Sacramento
SAN FRANCISCO
Oakland
San Jose
Santa Cruz
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