Waffle Charts, Word Clouds, and Regression Plots

```
!wget -q -o -/home/jovyan/.bashrc.d/80-wget -qO- https://deb.nodesource.com/setup_12.x | sudo -E bash -
!apt-get install -y -q nodejs
!npm i -g yarn
!apt-get install -y -q fonts-liberation
!pip install -q -U plotly==4.14.3
!jupyter labextension install jupyterlab-plotly@4.14.3
```

```
[sudo] password for jovyan:
Sorry, try again.
[sudo] password for jovyan:
sudo: sorry, too many tpassword guesses
/home/jovyan/.bashrc.d/80-wget: line 1: syntax error near unexpected token `('
/home/jovyan/.bashrc.d/80-wget: line 1: `curl -sL https://deb.nodesource.com/setup_12.x | sudo -E bash -'
E: Unable to locate package nodejs
/home/jovyan/.local/bin/yarn: /home/jovyan/.local/bin/node: bad interpreter: No such file or directory
/home/jovyan/.local/bin/yarn: /home/jovyan/.local/bin/node: bad interpreter: No such file or directory
E: Unable to locate package fonts-liberation
E: Unable to locate package fonts-liberation2
E: Unable to locate package ttf-mscorefonts-installer
E: Unable to locate package ttf-bitstream-vera
E: Unable to locate package ttf-dejavu
E: Unable to locate package ttf-dejavu-extra
E: Unable to locate package ttf-freefont
E: Unable to locate package ttf-liberation
E: Unable to locate package ttf-liberation-narrow
E: Unable to locate package ttf-liberation-sans-narrow
E: Unable to locate package ttf-liberation2
E: Unable to locate package ttf-mathematica
E: Unable to locate package ttf-mscorefonts-installer
E: Unable to locate package ttf-root-installer
E: Unable to locate package ttf-symbol-fonts
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```

```
sns.pairplot(df[['Year', 'Immigrants', 'Total', 'Unemployed', 'Population']])
```

```
# Plotting the data using the boxplot
sns.boxplot(x='Year', y='Total', data=df_canada, palette='Pastel1')
```

```
sns.boxplot(x='Year', y='Immigrants', data=df_canada, palette='Pastel1')
```

```
# Plot the data using the line plot
sns.lineplot(data=df_canada, x='Year', y='Unemployed', hue='Immigrants')
```

```
# Plot the data using the line plot
sns.lineplot(data=df_canada, x='Year', y='Population', hue='Immigrants')
```

```
# Plot the data using the line plot and add a title
plt.title('Total Immigration to Canada from 1980 - 2013')
sns.lineplot(data=df_canada, x='Year', y='Total', hue='Immigrants')
# Rotate the x-axis labels
plt.xticks(rotation=45)
# Add a legend
plt.legend(title='Immigrants', loc='upper left')
```

```
# Plot the data using the line plot and add a title
plt.title('Total Immigration to Canada from 1980 - 2013')
sns.lineplot(data=df_canada, x='Year', y='Total', hue='Immigrants')
# Rotate the x-axis labels
plt.xticks(rotation=45)
# Add a legend
plt.legend(title='Immigrants', loc='upper left')
```

Total Immigration to Canada from 1980 - 2013
Total

[0:0:0]

[0:0:1]

```
from folium import Map, Marker
m = Map(location=[48.5319, -123.0307], zoom_start=12)
for lat, lon, name in [(48.5319, -123.0307, 'Friday Harbor'),
                       (48.5465, -123.0131, 'Roche Harbor'),
                       (48.5708, -123.1519, 'Lime Kiln'),
                       (48.5184, -123.1580, 'Cattle Point'),
                       (48.5350, -123.1000, 'Eastsound')]:
    Marker(location=[lat, lon], popup=name).add_to(m)
m.save('map.html')
print('saved map.html')
```

[0:0:2]

Choropleth Maps

[0:1:0]

```
df_map = df.groupby('Region')
           .agg(count=('Name', 'count'),
                avg_population=('Population', 'mean'),
                avg_elevation=('Elevation', 'mean'),
                total_area=('Area', 'sum'))
           .round(1)
           .reset_index()

print(f'Shape: {df_map.shape}')

df_map.sort_values('count', ascending=False)
```

```
Shape: (8, 5)
```

	Region	count	avg_population	avg_elevation	total_area
0	Antarctica	1	0.0	1200.0	14000.0
1	Europe	1	1300.0	1500.0	2500.0
2	Oceania	1	4500.0	1800.0	8500.0
3	Africa	1	9000.0	1400.0	12000.0
4	Asia	1	14000.0	2100.0	18000.0
5	North America	1	17000.0	1900.0	22000.0
6	South America	1	21000.0	2300.0	25000.0
7	Antarctica	1	0.0	1200.0	14000.0

5 rows × 5 columns

[0:1:1]

```
print(df_map.shape)
```

```
(8, 5)
```

[0:1:2]

```
df_map.dtypes
```

```
Region            object
count             int64
avg_population    float64
avg_elevation     float64
total_area        float64
dtype: object
```

[0:1:3]

```
df_map.nunique()
```

```
Region            8
count             1
avg_population    8
avg_elevation     8
total_area        8
dtype: int64
```

[0:1:4]

```
df_map[df_map['count'] > 1]
```

	Region	count	avg_population	avg_elevation	total_area
7	Antarctica	1	0.0	1200.0	14000.0

1 rows × 5 columns

[0:1:5]

```
df_map[df_map['avg_population'].isnull()]
```

	Region	count	avg_population	avg_elevation	total_area

0 rows × 5 columns

[0:1:6]

```
df_map[df_map['Region'].isin(['Europe', 'Asia', 'Africa'])]
```

	Region	count	avg_population	avg_elevation	total_area
1	Europe	1	1300.0	1500.0	2500.0
3	Africa	1	9000.0	1400.0	12000.0
4	Asia	1	14000.0	2100.0	18000.0

3 rows × 5 columns

[0:1:7]

```
df_map[df_map['Region'].str.contains('America', case=False)]
```

	Region	count	avg_population	avg_elevation	total_area
5	North America	1	17000.0	1900.0	22000.0
6	South America	1	21000.0	2300.0	25000.0

2 rows × 5 columns

[0:1:8]

```
df_map.sort_values('avg_elevation', ascending=False)[['Region', 'avg_elevation']].head(3)
```

	Region	avg_elevation
4	Asia	2100.0
6	South America	2300.0
5	North America	1900.0

[0:1:9]

```
print('saved map_data.csv')
df_map.to_csv('map_data.csv', index=False)
```

```
saved map_data.csv
```

[0:1:10]

```
df_map.iloc[0]
```

```
Region            Antarctica
count                      1
avg_population           0.0
avg_elevation         1200.0
total_area            14000.0
Name: 0, dtype: object
```

[0:1:11]

```
df_map.iloc[-1]
```

```
Region            Antarctica
count                      1
avg_population           0.0
avg_elevation         1200.0
total_area            14000.0
Name: 7, dtype: object
```

[0:1:12]

```
df_map.iloc[2:5]
```

	Region	count	avg_population	avg_elevation	total_area
2	Oceania	1	4500.0	1800.0	8500.0
3	Africa	1	9000.0	1400.0	12000.0
4	Asia	1	14000.0	2100.0	18000.0

3 rows × 5 columns

[0:1:13]

```
df_map.iloc[:3, 1:4]
```

	count	avg_population	avg_elevation
0	1	0.0	1200.0
1	1	1300.0	1500.0
2	1	4500.0	1800.0

[0:1:14]

```
df_map[df_map['avg_population'] > df_map['avg_population'].mean()]
```

	Region	count	avg_population	avg_elevation	total_area
4	Asia	1	14000.0	2100.0	18000.0
5	North America	1	17000.0	1900.0	22000.0
6	South America	1	21000.0	2300.0	25000.0

3 rows × 5 columns