

```
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib as mpl
```

```
↳ /usr/local/lib/python3.6/dist-packages/statsmodels/tools/_testing.py:19: FutureWarning: pandas.util.testing is deprecated
import pandas.util.testing as tm
```

```
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)
```

```
canada = pd.read_csv("/content/drive/My Drive/Python DataScience/Visualization/Seaborn/canada.csv")
canada.head()
```

```
↳
```

```
canada.drop(columns=['AREA' , 'DEV', 'DevName' , 'REG', 'Type', 'Coverage' , 'AreaName']
canada.head()
```

↗

	OdName	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	199
0	Afghanistan	16	39	39	47	71	340	496	741	828	1076	1028	1378	1170	713	858	1537	2212	255
1	Albania	1	0	0	0	0	0	1	2	2	3	3	21	56	96	71	63	113	30
2	Algeria	80	67	71	69	63	44	69	132	242	434	491	872	795	717	595	1106	2054	184
3	American Samoa	0	1	0	0	0	0	0	1	0	1	2	0	0	0	0	0	0	
4	Andorra	0	0	0	0	0	0	2	0	0	0	3	0	1	0	0	0	0	

```
canada.rename(columns={'OdName':'Country'}, inplace=True)
canada.set_index(canada.Country,inplace=True)
canada.head()
```

↗

	Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
	Country																
Afghanistan	Afghanistan	16	39	39	47	71	340	496	741	828	1076	1028	1378	1170	713	858	1537
Albania	Albania	1	0	0	0	0	0	1	2	2	3	3	21	56	96	71	63
Algeria	Algeria	80	67	71	69	63	44	69	132	242	434	491	872	795	717	595	1106
American Samoa	American Samoa	0	1	0	0	0	0	0	1	0	1	2	0	0	0	0	0
Andorra	Andorra	0	0	0	0	0	0	2	0	0	0	3	0	1	0	0	0

```
canada.index.name=None
```

```
ax = sns.heatmap(canada1, vmin=0, vmax=8000, cmap="YlGnBu")
plt.yticks(rotation=0)
plt.show()

# sns.heatmap(df, cmap="YlGnBu")
# sns.heatmap(df, cmap="Blues")
# sns.heatmap(df, cmap="BuPu")
# sns.heatmap(df, cmap="Greens")
# https://matplotlib.org/3.1.0/tutorials/colors/colormaps.html
```



```
canada.index.name=None
```

```
canada.head()
```

↗

	Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Afghanistan	Afghanistan	16	39	39	47	71	340	496	741	828	1076	1028	1378	1170	713	858	1537
Albania	Albania	1	0	0	0	0	0	1	2	2	3	3	21	56	96	71	63
Algeria	Algeria	80	67	71	69	63	44	69	132	242	434	491	872	795	717	595	1106
American Samoa	American Samoa	0	1	0	0	0	0	0	1	0	1	2	0	0	0	0	0
Andorra	Andorra	0	0	0	0	0	0	2	0	0	0	3	0	1	0	0	0

```
del canada['Country']
```

```
canada.head()
```

↗

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Afghanistan	16	39	39	47	71	340	496	741	828	1076	1028	1378	1170	713	858	1537	2212	2555
Albania	1	0	0	0	0	0	1	2	2	3	3	21	56	96	71	63	113	307
Algeria	80	67	71	69	63	44	69	132	242	434	491	872	795	717	595	1106	2054	1842
American Samoa	0	1	0	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0
Andorra	0	0	0	0	0	0	2	0	0	0	3	0	1	0	0	0	0	0

```
canada = canada.transpose()
```

```
canada.head()
```

```
# Turn off the colorbar -> cbar=False
plt.figure(figsize=(20,11))
ax = sns.heatmap(canada1,vmin=0, vmax=8000,cmap="YlGnBu", linewidths=.5,
                  annot=True ,annot_kws={'size':14} ,fmt=".1f" , cbar=False)
plt.yticks(rotation=0)
plt.show()
```





	Afghanistan	Albania	Algeria	American Samoa	Andorra	Angola	Antigua and Barbuda	Argentina	Armenia	Australia	Austria	Azerbaijan
1980	16	1	80	0	0	1	0	368	0	702	234	
1981	39	0	67	1	0	3	0	426	0	639	238	
1982	39	0	71	0	0	6	0	626	0	484	201	
1983	47	0	69	0	0	6	0	241	0	317	117	
1984	71	0	63	0	0	4	42	237	0	317	127	

5 rows × 197 columns

▼ Heat Map

A heat map is a data visualization technique that shows magnitude of a phenomenon as color in two dimensions. The variation in color may be by hue or intensity, giving obvious visual cues to the reader about how the phenomenon is clustered or varies over space.

```
canada1 = canada.loc['2004': , ['Germany' , 'France' , 'Mexico' , 'Bangladesh' , 'Brazil']
canada1.head()
```

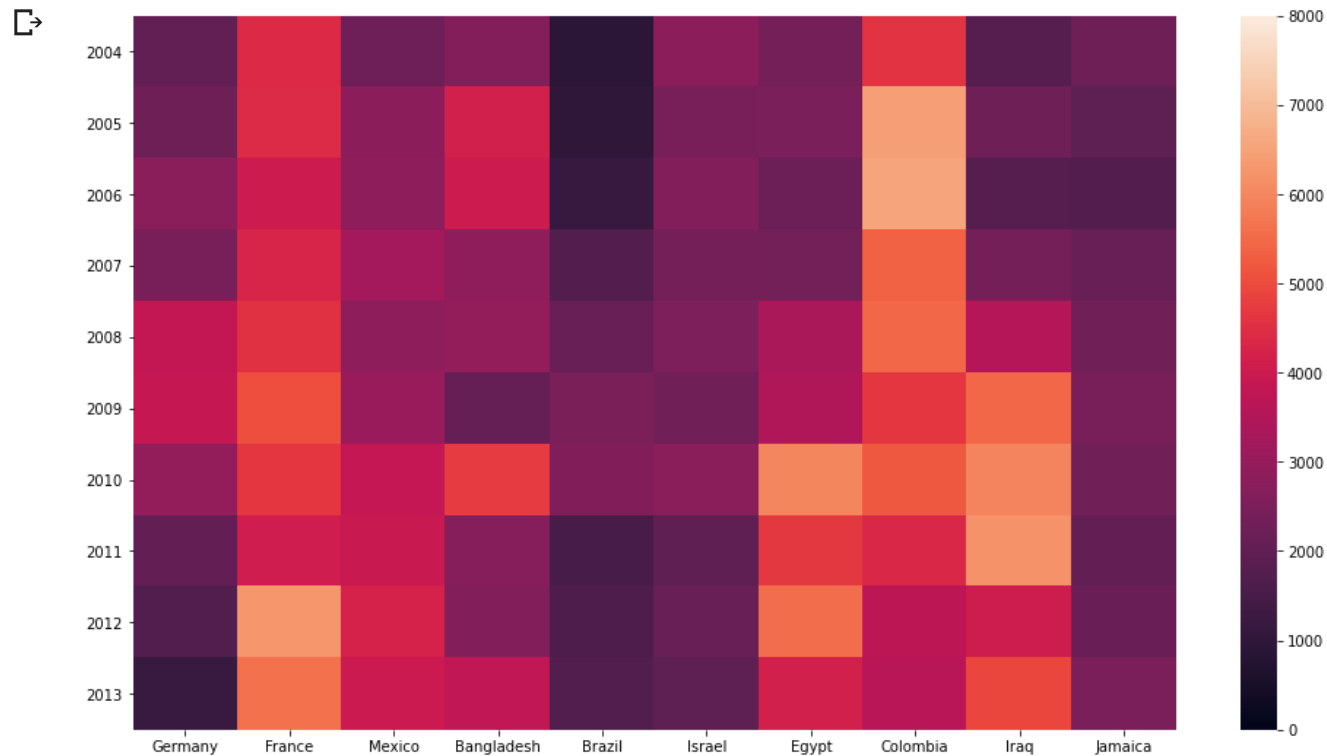


	Germany	France	Mexico	Bangladesh	Brazil	Israel	Egypt	Colombia	Iraq	Jamaica
2004	2020	4391	2259	2660	917	2788	2393	4566	1796	2237
2005	2226	4429	2837	4171	969	2446	2496	6424	2226	1945

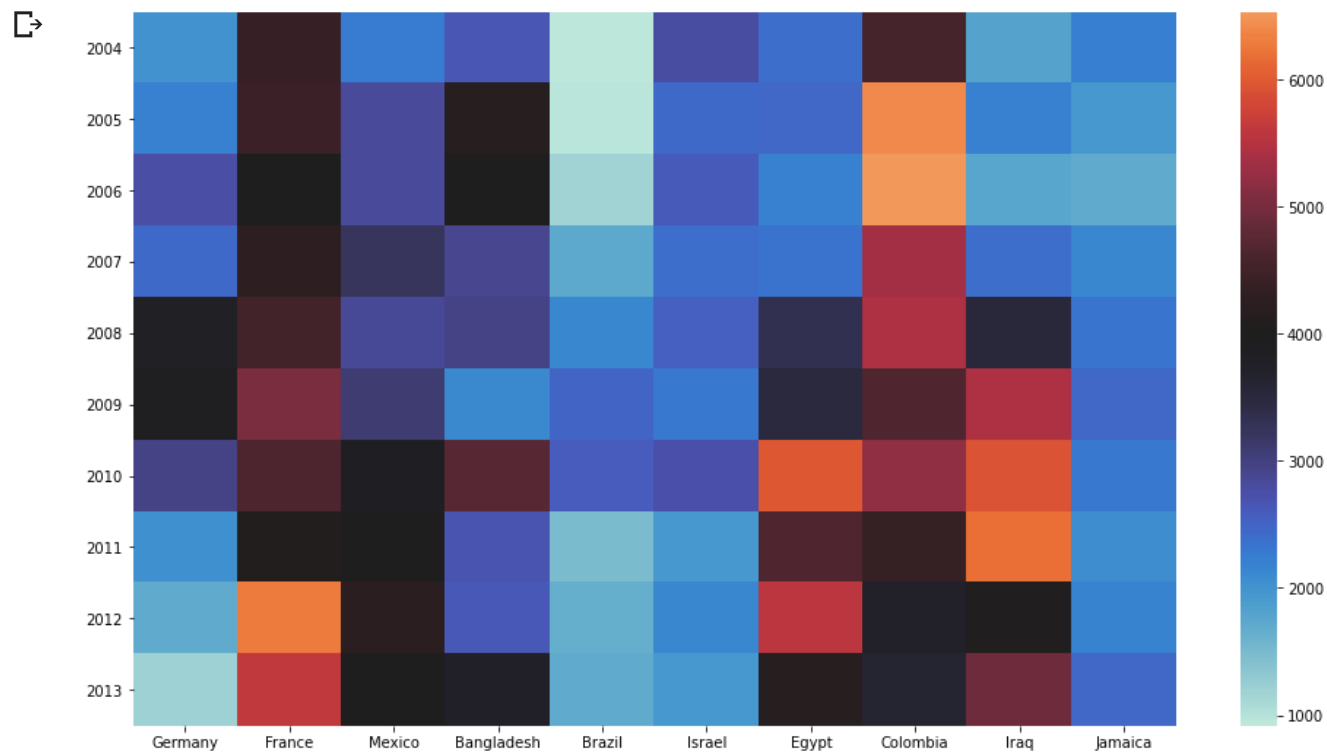
```
plt.figure(figsize=(16,9))  
ax = sns.heatmap(canada1)  
plt.yticks(rotation=0)  
plt.show()
```



```
# Changing the limits of the colormap
plt.figure(figsize=(16,9))
ax = sns.heatmap(canada1,vmin=0, vmax=8000)
plt.yticks(rotation=0)
plt.show()
```



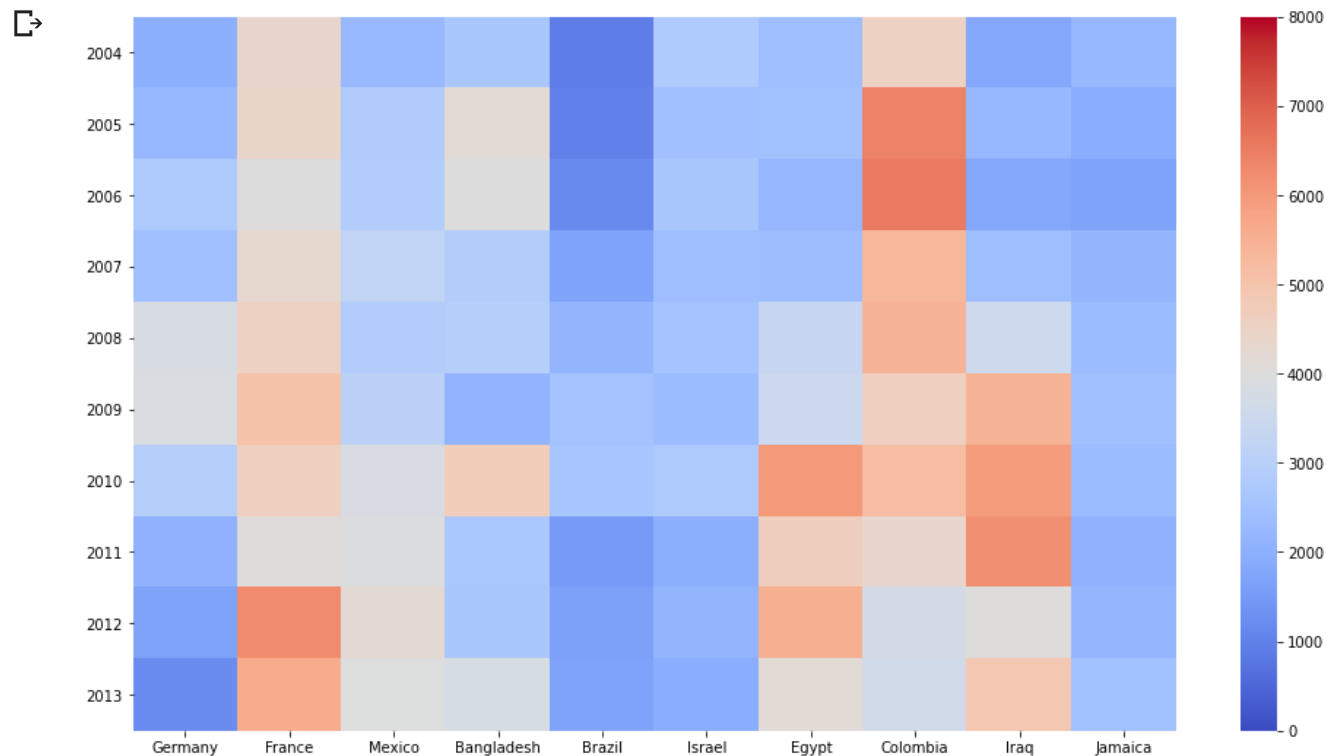

```
# Plot a heatmap for data centered on 4000 with a diverging colormap
plt.figure(figsize=(16,9))
ax = sns.heatmap(canada1,center=4000)
plt.yticks(rotation=0)
plt.show()
```



```
# Changing cmap
plt.figure(figsize=(16,9))
```

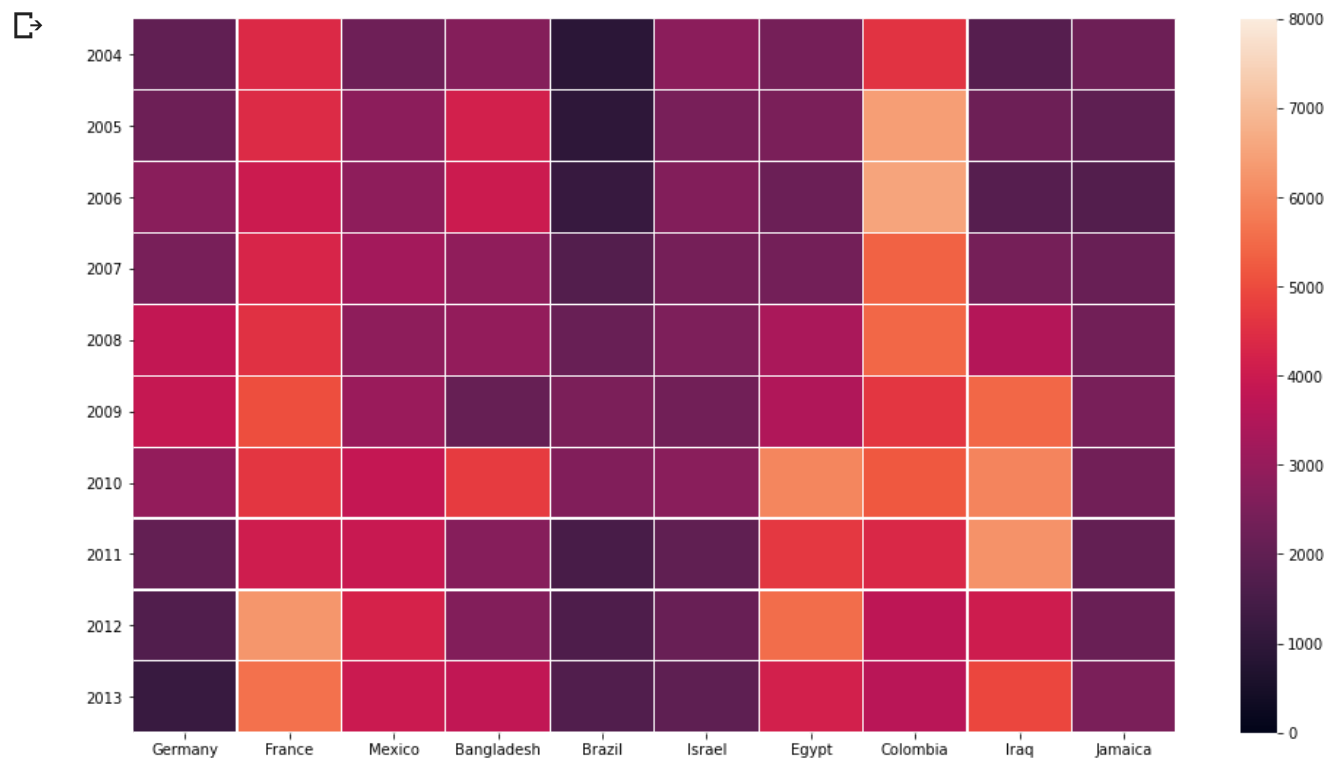


```
plt.figure(figsize=(16,9))
ax = sns.heatmap(canada1,vmin=0, vmax=8000,cmap="coolwarm")
plt.yticks(rotation=0)
plt.show()
```



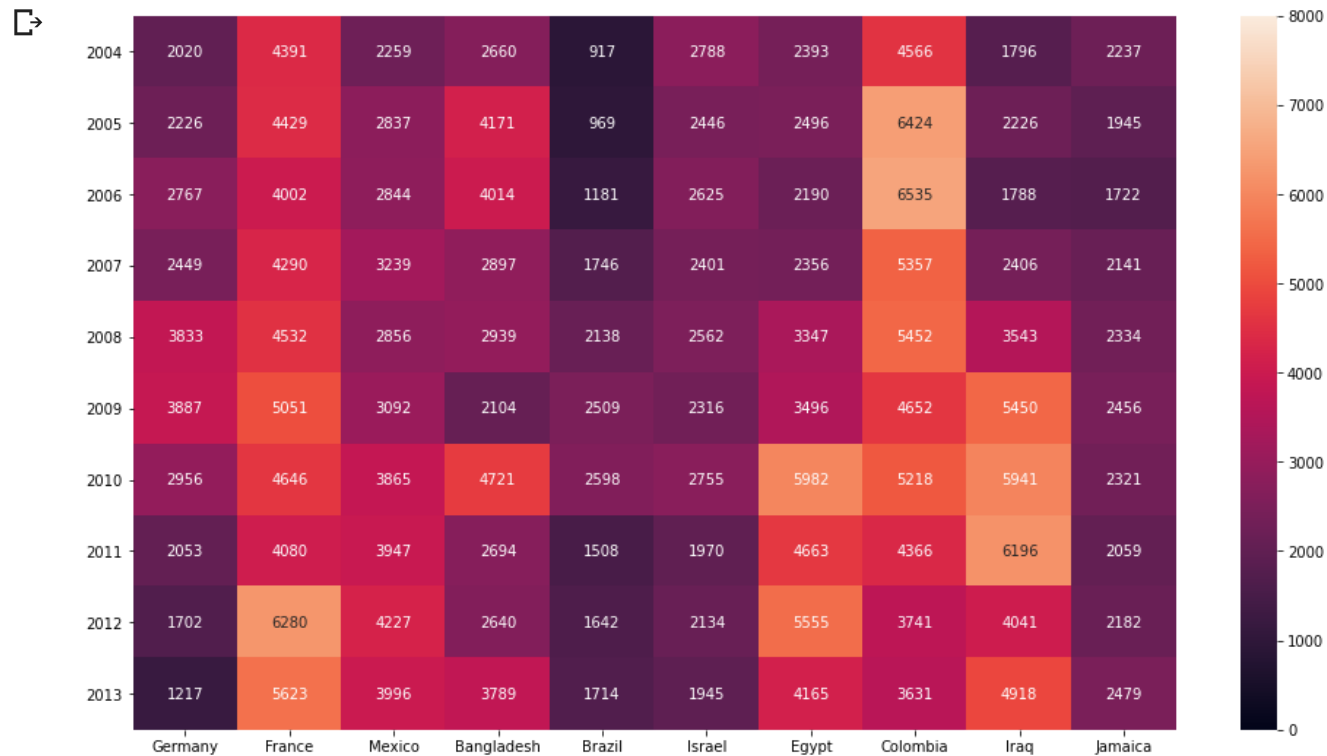
```
# Add lines between each cell
```

```
# Add lines between each cell
plt.figure(figsize=(16,9))
ax = sns.heatmap(canada1,vmin=0, vmax=8000,linewidths=.1)
plt.yticks(rotation=0)
plt.show()
```



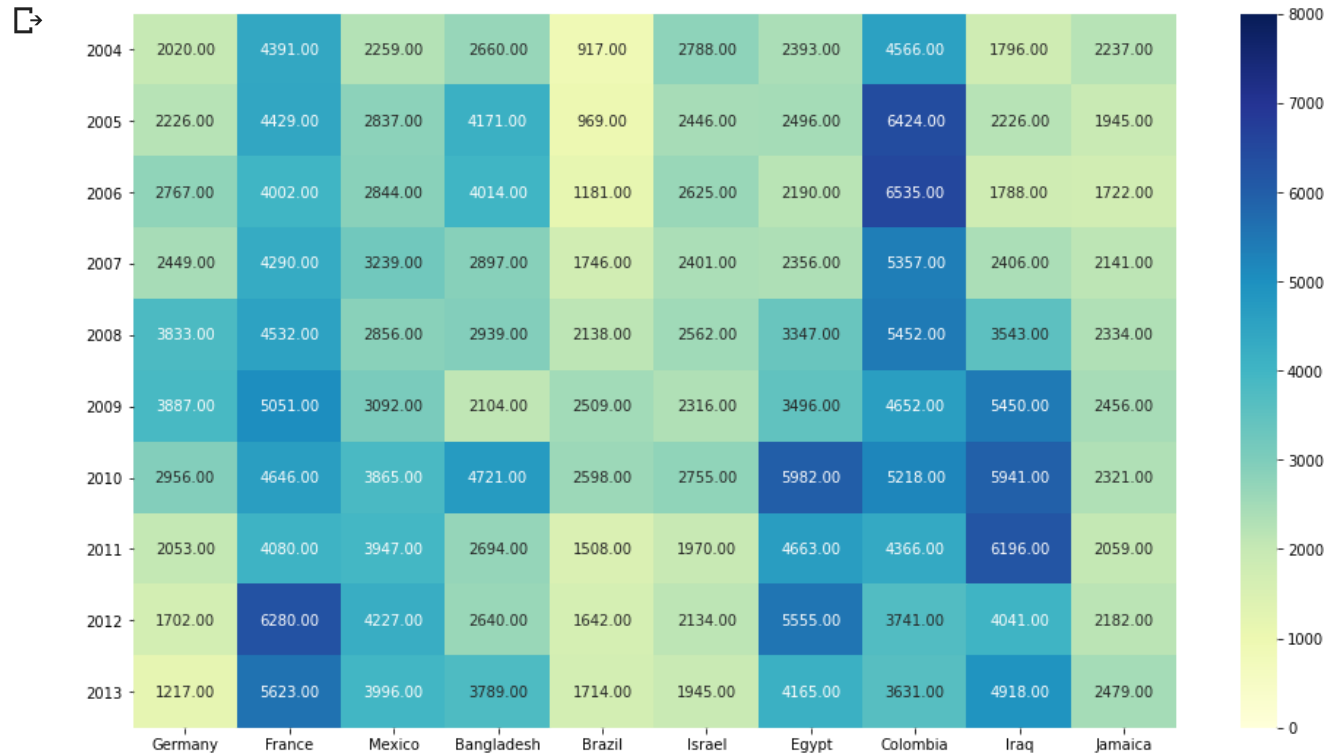
```
# Annotate each cell with the numeric value using integer formatting
plt.figure(figsize=(16,9))
```

```
ax = sns.heatmap(canada1,vmin=0, vmax=8000,annot=True, fmt="d")
plt.yticks(rotation=0)
plt.show()
```



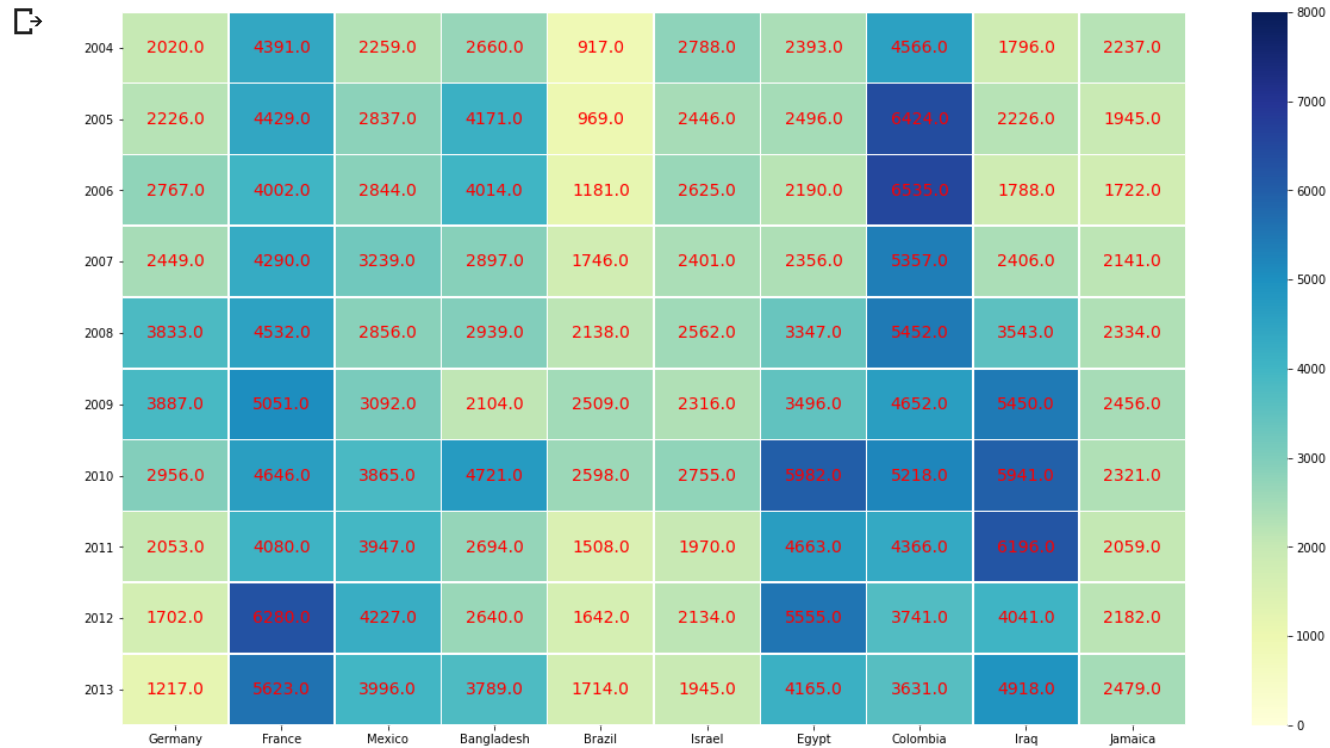
```
# Annotate each cell with the numeric value using decimal formatting
plt.figure(figsize=(16,9))
ax = sns.heatmap(canada1,vmin=0, vmax=8000,cmap="YlGnBu", annot=True ,fmt=".2f")
plt.vticks(rotation=0)
```

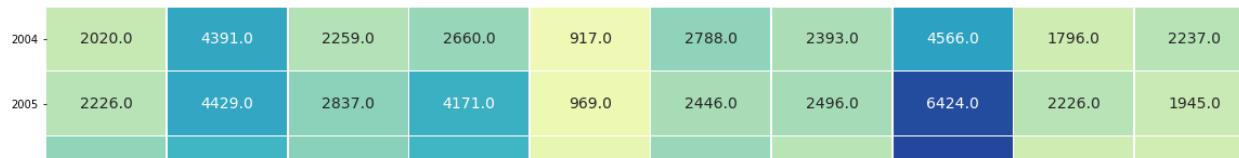
```
plt.show()
```



```
plt.figure(figsize=(20,11))
ax = sns.heatmap(canada1,vmin=0, vmax=8000,cmap="YlGnBu", linewidths=.5, annot=True ,an
plt.yticks(rotation=0)
plt.show()
```

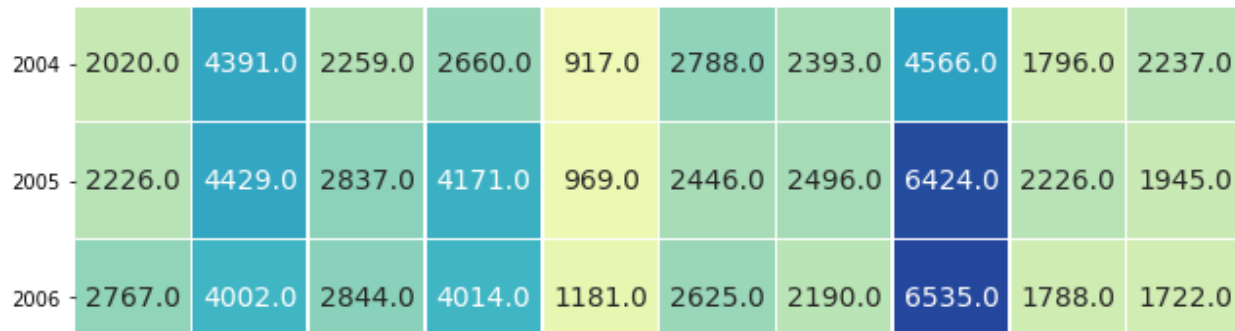
```
#annot_kws = {'color':'#FF0000','rotation':'vertical'}
#https://matplotlib.org/api/_as_gen/matplotlib.axes.Axes.text.html
```





```
# Force the aspect ratio of the blocks to be equal using "square" parameter
plt.figure(figsize=(20,11))
ax = sns.heatmap(canada1,vmin=0, vmax=8000,cmap="YlGnBu", linewidths=.5,
                  annot=True ,annot_kws={'size':14} ,fmt=".1f" , cbar=False ,square = True)
plt.yticks(rotation=0)
plt.show()
```





```
sns.set(rc={'xtick.labelsize':17,'ytick.labelsize':17,'axes.labelsize':20})
```

```
plt.figure(figsize=(20,12))
```

```
plt.rcParams['figure.facecolor'] = "#a1c45a"
```

```
plt.rcParams['axes.facecolor'] = "#a1c45a"
```

```
plt.rcParams['axes.labelsize'] = 20
```

```
plt.rcParams['xtick.labelsize'] = 15
```

```
plt.rcParams['ytick.labelsize'] = 15
```

```
ax = sns.heatmap(canada1,vmin=0, vmax=8000,cmap="YlGnBu", linewidths=.5,annot=True ,ann
```

```
plt.yticks(rotation=0)
```

```
plt.text(4,-.2, "Heat Map", fontsize = 50, color='Black')
```

```
plt.show()
```



Heat Map

