Exploring Weather Treands.

```
1 import numpy as np
2 import pandas as pd
3 import seaborn as sns
4 from matplotlib import pyplot as plt
```

```
1 #Using the SQL workbench on Udacity I was able to pull the data using the following two SQL queries.
2 """
3 SELECT * FROM city_data WHERE city LIKE '%Houston%'
4 SELECT * FROM global_data
5 """
6
7 #Loading data from csv file, for both city and global data.
8 city_data = pd.read_csv('/city_data.csv')
9 #Renaming the global data colunms for clearity.
10 global_cols = ['year', 'global_avg_temp']
11 global_data = pd.read_csv('/global_data.csv', names=global_cols, skiprows=1)
```

Considerations and Observations

When comparing the global with the average tempurature in Houston, TX we can see that the tempurature does vary using a window of 1 for the moving average both for the global and the city date, we can clearly see the spike for this plot. Using the line plot we can we see when we move from 1 year to 5, we notice that the moving average line starts to get smoother, as well as both the 7 and 10 year marks too.

We can see that the min and max for both the world and for Houston, Tx does vary. While the avg are different we can see from our line plots that we are moving in the same direction over time. We see that from the min and max for the global and Houston never passed over 4.05 for that threshold.

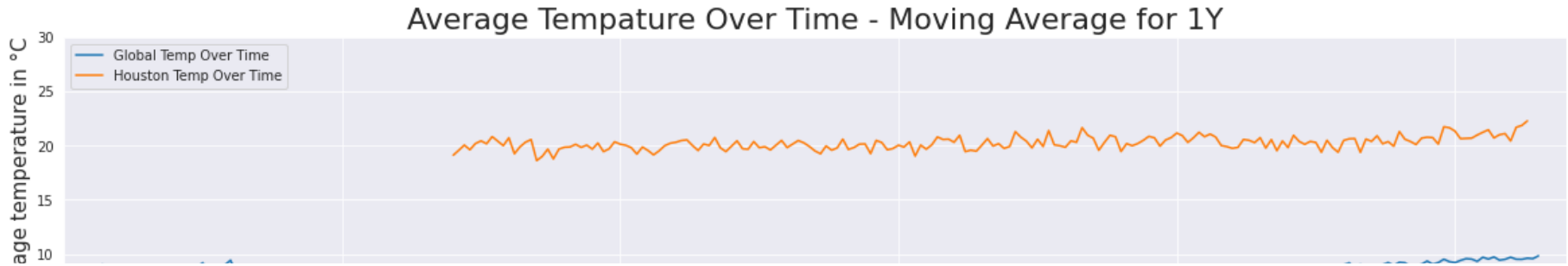
Double-click (or enter) to edit

```
#Moving averages for 1 year
city_data['houston_ma'] = city_data['avg_temp'].rolling(window=1).mean()
global_data['global_ma'] = global_data['global_avg_temp'].rolling(window=1).mean()

#storing temperature and years for colunm values for plotting
#Global
global_ma = global_data['global_avg_temp']
year_global = global_data['year']
#City
houston_ma = city_data['houston_ma']
year_houston = city_data['year']

fig = plt.figure(figsize=(20, 17))
plt.subplot(4,1,1)
plt.grid()
plt.plot(year_global,global_ma, label='Global Temp Over Time')
plt.plot(year_houston,houston_ma, label='Houston Temp Over Time')
plt.legend(loc=2)
plt.ylim(5,30)
plt.xlim(1750,2020)
plt.title('Average Tempature Over Time - Moving Average for 1Y',fontsize=22)
plt.xlabel('Years',fontsize=17)
plt.ylabel('Temperature in °C',fontsize=15)
```

```
Text(0, 0.5, 'Average temperature in °C')
```

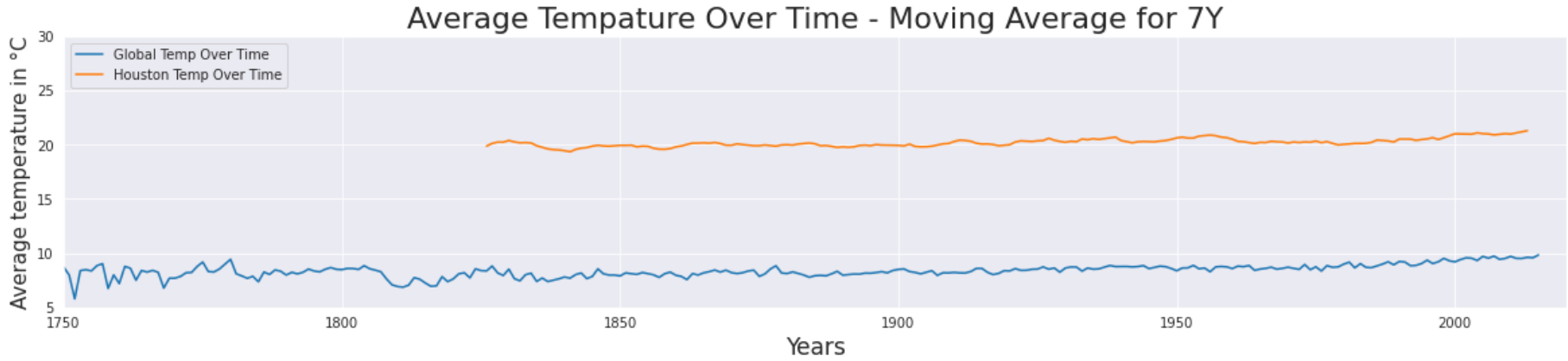



```
#Moving averages for 5 years
city_data['houston_ma'] = city_data['avg_temp'].rolling(window=5).mean()
global_data['global_ma'] = global_data['global_avg_temp'].rolling(window=5).mean()
fig = plt.figure(figsize=(20, 17))
plt.subplot(4,1,1)
plt.grid()
plt.plot(year_global,global_ma, label='Global Temp Over Time')
plt.plot(year_houston,houston_ma, label='Houston Temp Over Time')
plt.legend(loc=2)
plt.ylim(5,30)
plt.xlim(1750,2020)
plt.title('Average Tempature Over Time - Moving Average for 5Y',fontsize=22)
plt.xlabel('Years',fontsize=17)
plt.ylabel('Temperature in °C',fontsize=15)
```

```
Text(0, 0.5, 'Average temperature in °C')
```

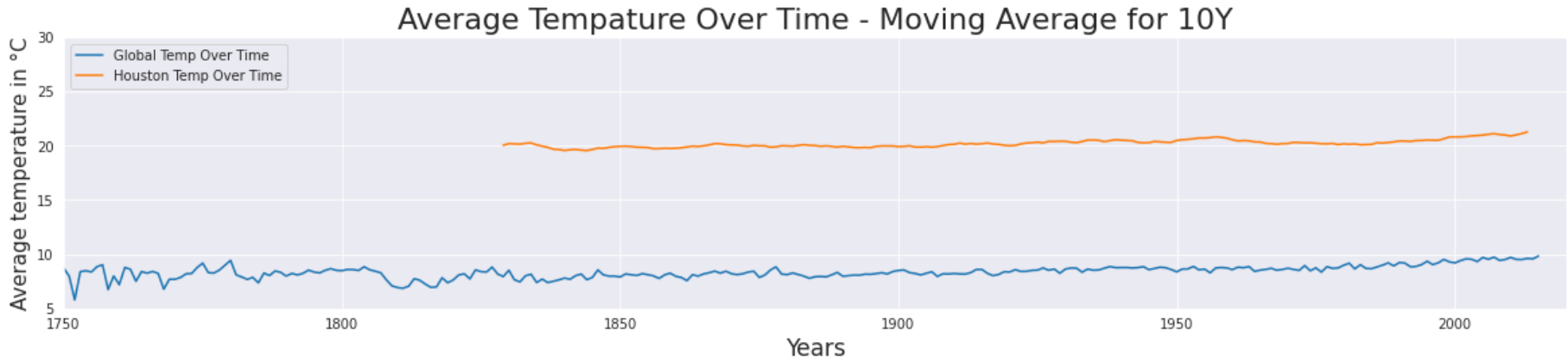

```
#Moving averages for 7 years
city_data['houston_ma'] = city_data['avg_temp'].rolling(window=7).mean()
global_data['global_ma'] = global_data['global_avg_temp'].rolling(window=7).mean()
fig = plt.figure(figsize=(20, 17))
plt.subplot(4,1,1)
plt.grid()
plt.plot(year_global,global_ma, label='Global Temp Over Time')
plt.plot(year_houston,houston_ma, label='Houston Temp Over Time')
plt.legend(loc=2)
plt.ylim(5,30)
plt.xlim(1750,2020)
plt.title('Average Tempature Over Time - Moving Average for 7Y',fontsize=22)
plt.xlabel('Years',fontsize=17)
plt.ylabel('Temperature in °C',fontsize=15)
```

```
Text(0, 0.5, 'Average temperature in °C')
```



```
#Moving averages for 10 years
city_data['houston_ma'] = city_data['avg_temp'].rolling(window=10).mean()
global_data['global_ma'] = global_data['global_avg_temp'].rolling(window=10).mean()
fig = plt.figure(figsize=(20, 17))
plt.subplot(4,1,1)
plt.grid()
plt.plot(year_global,global_ma, label='Global Temp Over Time')
plt.plot(year_houston,houston_ma, label='Houston Temp Over Time')
plt.legend(loc=2)
plt.ylim(5,30)
plt.xlim(1750,2020)
plt.title('Average Tempature Over Time - Moving Average for 10Y',fontsize=22)
plt.xlabel('Years',fontsize=17)
plt.ylabel('Temperature in °C',fontsize=15)
```

```
Text(0, 0.5, 'Average temperature in °C')
```




```
#Global
min_temp_global = global_data['global_avg_temp'].min()
max_temp_global = global_data['global_avg_temp'].max()
avg_temp_global = global_data['global_avg_temp'].mean()
```

```
5
6 #Houston, Texas
7 min_temp_city = city_data['avg_temp'].min()
8 max_temp_city = city_data['avg_temp'].max()
9 avg_temp_city = city_data['avg_temp'].mean()
```

```
1 print(min_temp_global, max_temp_global, avg_temp_global )
2 print(min_temp_city, max_temp_city, avg_temp_city)
```

```
5.78 9.83 8.36947368421053
18.62 22.28 20.231597938144326
```

```
1 print(f'The avg temp for the world was {avg_temp_global}, while the min was {min_temp_global}, and the max was {max_
```

```
The avg temp for the world was 8.36947368421053, while the min was 5.78, and the max was 9.83. And the difference between the min and
```

```
1 print(f'The avg temp for Houston,TX was {avg_temp_city}, while the min was {min_temp_city}, and the max was {max_ter
```

```
The avg temp for Houston,TX was 20.231597938144326, while the min was 18.62, and the max was 22.28. And the differance between the m
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