Exploring_Weather_Trends

February 20, 2023

[1]:
```
import pandas as pd
import matplotlib.pyplot as plt
%matplotlib inline
```

0.1 Data Gathering

[2]:
```
city = pd.read_csv('results_city.csv')
```

[3]:
```
city.head()
```

[3]:

	year	city	country	avg_temp
0	1743	Hamburg	Germany	6.23
1	1744	Hamburg	Germany	9.63
2	1745	Hamburg	Germany	1.25
3	1746	Hamburg	Germany	NaN
4	1747	Hamburg	Germany	NaN

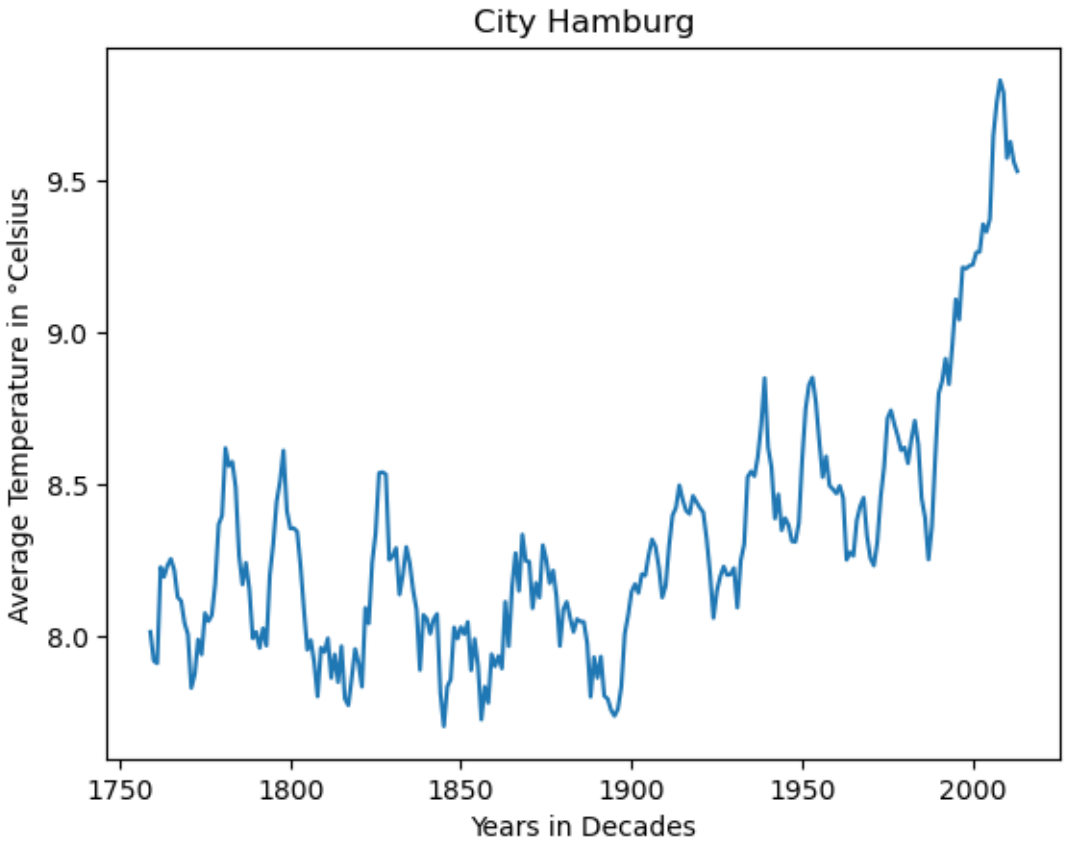
[4]:
```
city_decade = city.avg_temp.rolling(10).mean()
city_decade[10:20]
```

[4]:
```
10      NaN
11      NaN
12      NaN
13      NaN
14      NaN
15      NaN
16    8.016
17    7.921
18    7.913
19    8.229
Name: avg_temp, dtype: float64
```

0.2 Plotting City Data

[5]:
```
plt.figure()
plt.plot(city.year, city_decade)
plt.xlabel("Years in Decades")
plt.ylabel("Average Temperature in °Celsius")
plt.title("City Hamburg")

plt.show()
```



[8]:
```
globe = pd.read_csv('results_global.csv')
```

[9]:
```
globe.head()
```

[9]:

	year	avg_temp
0	1750	8.72
1	1751	7.98
2	1752	5.78
3	1753	8.39
4	1754	8.47

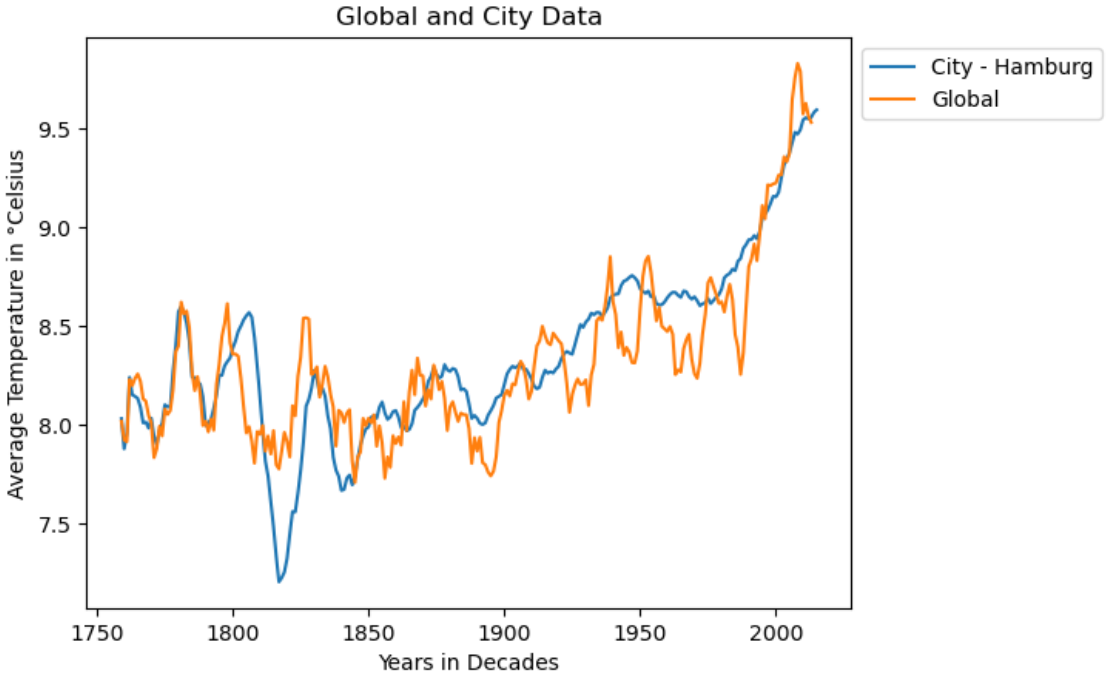
[10]:
```
globe_decade = globe.avg_temp.rolling(10).mean()
globe_decade[10:20]
```

[10]:
```
10    7.877
11    7.956
12    8.239
13    8.150
14    8.143
15    8.132
16    8.088
17    8.008
18    8.012
19    7.982
Name: avg_temp, dtype: float64
```

0.3 Plotting City and Global Data

[11]:
```
plt.figure()
plt.plot(globe.year, globe_decade, label='Global')
plt.plot(city.year, city_decade, label='City')
d ={'City - Hamburg': city_decade, 'Global': globe_decade}
plt.legend(d, bbox_to_anchor=(1.0, 1.0))
plt.xlabel("Years in Decades")
plt.ylabel("Average Temperature in °Celsius")
plt.title("Global and City Data")

plt.show()
```



0.4 Outline

The datasets where downloaded in csv-format from a database provided by Udacity with SQL queries, for analysis the data where gathered in a jupyter notebook with pandas, after calculating the rolling averages the data where plotted with matplotlib line chart functionality. Considering the timespan of the dataset a rolling average of 10 years was chosen, the final plot lies the data for the city and the global data together to allow direct comparison and discussion below in the conclusion.

0.5 Conclusion

Given the duration in regards to time for weather data, it was appropriate to set the rolling average to 10 years, hence plotted above are rolling averages and the closest city to my residence has shown a steady rise of temperature since the start of the industrialization, with at steep increase in the last 2-3 decades. **This development is in line with the global increase in temperature**, which however shows a steader increase after 1840-2013, compared to the global development which is shows a similar increase but with higher swings during this period of time. As mentioned above the overall trend is a steep increase in temperature for both, the City of Hamburg and the globe alike.