Project1

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1 Project 1, Udacity Data Analyst Nano-degree: Exploring Weather Trends.

In this project, I will analyze local and global temperature data and compare the temperature trends where I live to overall global temperature trends.

1.0.1 Extracting the data

1- city_data (Alexandria) - This contains the average temperatures for each city by year (ºC). a SQL query to extract the city level data. Exported to CSV with name 'city_data.csv'.

SELECT * FROM city_data WHERE country = 'Egypt' AND city = 'Alexandria';

2- global_data - This contains the average global temperatures by year (ºC).
SELECT * FROM global_data;

1.0.2 IMPORTING PYTHON DATA SCIENCE PACKAGES, USED IN THE ANALYSIS OF DATA.

[1]:
```
import pandas as pd

import matplotlib.pyplot as plt
import numpy as np

plt.rcParams["figure.figsize"] = [10, 8]
```

1.1 OPENING UP THE CSV FILES

[3]:
```
city_data     = pd.read_csv('city_data.csv')

global_data = pd.read_csv('global_data.csv')
```

[4]:
```
city_data.head()
```

[4]:

	year	city	country	avg_temp
0	1791	Alexandria	Egypt	22.60
1	1792	Alexandria	Egypt	20.17
2	1793	Alexandria	Egypt	19.94
3	1794	Alexandria	Egypt	20.31
4	1795	Alexandria	Egypt	20.22

[5]:
```
global_data.head()
```

[5]:

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

1.1.1 Moving Average for the Global data and City data.

Now that I could extract data from a database, let's talk through the next step of completing the project: moving averages. Moving averages are used to smooth out data to make it easier to observe long term trends and not get lost in daily fluctuations Using a moving average, you can both smooth out the daily volatility and allow you to observe the long term trend.

1.1.2 Moving Average with Python:

Simple, cumulative, and exponential moving averages with Pandas The moving average is also known as rolling mean.

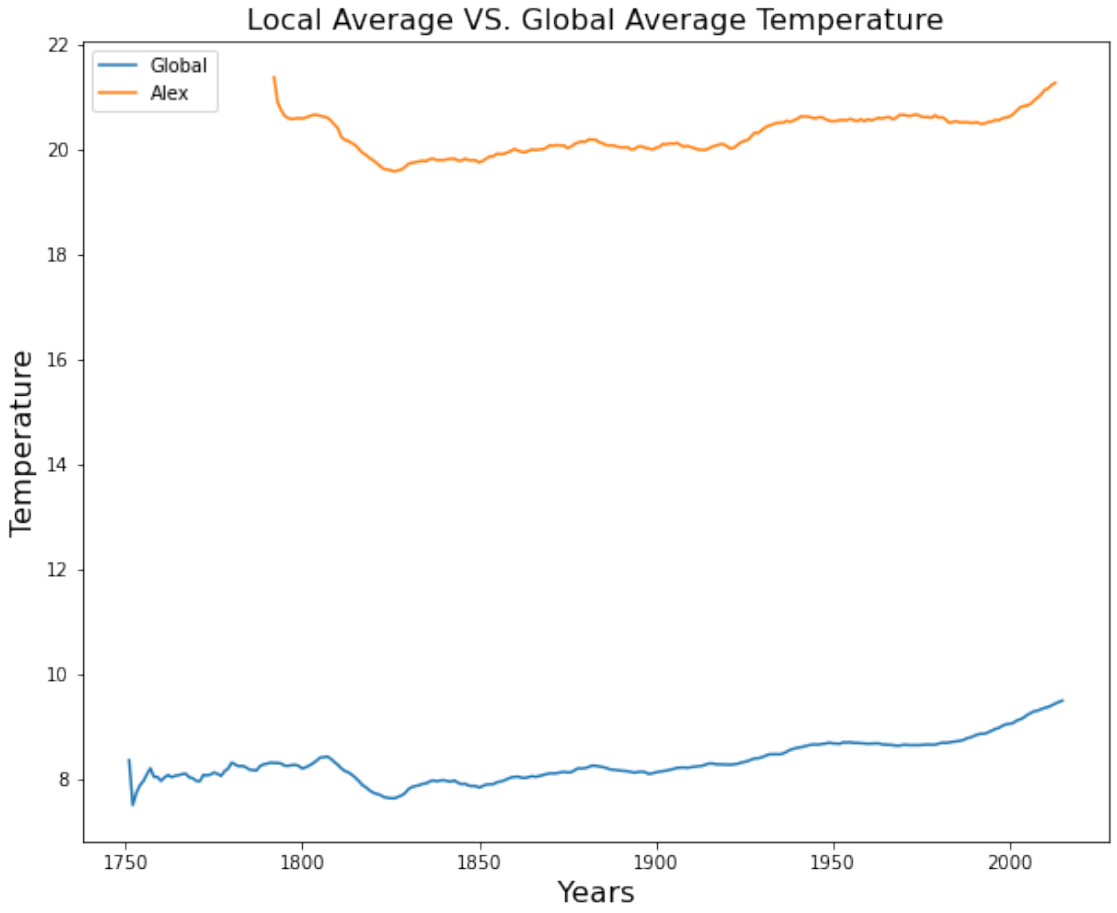
The easiest way to calculate the simple moving average is by using the pandas.Series.rolling method.

[14]:
```
global_avg = global_data['avg_temp'].rolling(20, min_periods=2).mean()

city_avg = city_data['avg_temp'].rolling(20, min_periods=2).mean()
```

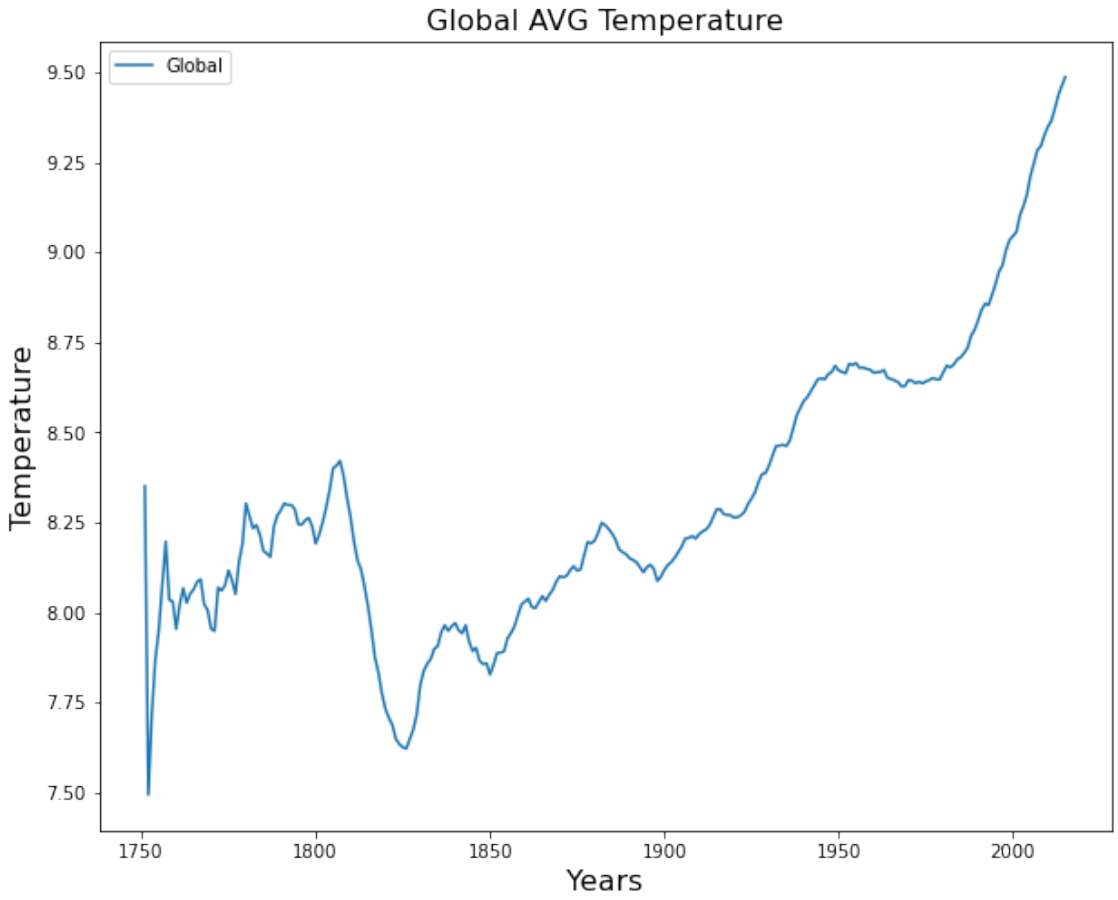
1.1.3 CREATING THE LINE CHARTS

Visualisations is done by matplotlib.pyplot python library.

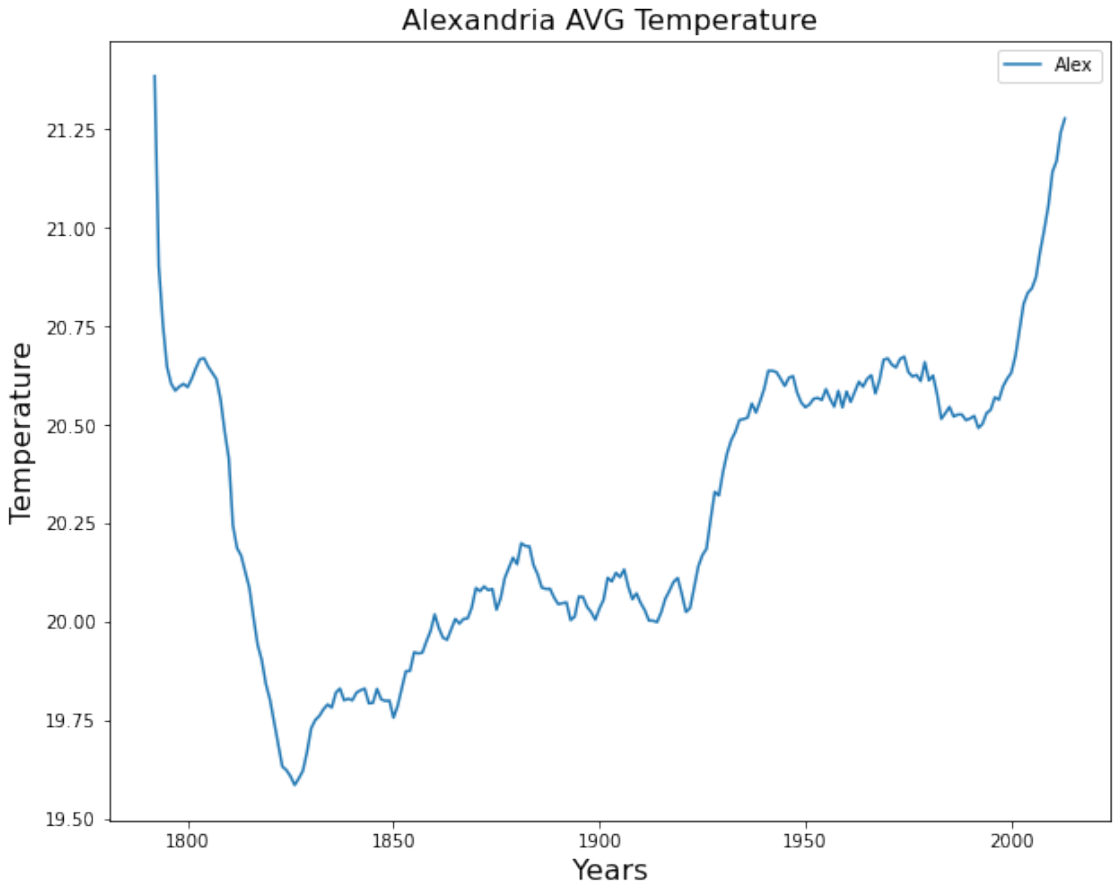
[20]:
```
plt.plot(global_data['year'], global_avg, label='Global')
plt.plot(city_data['year'], city_avg, label='Alex')

plt.legend()
plt.xlabel("Years", fontsize=16)
plt.ylabel("Temperature", fontsize=16)
plt.title("Local Average VS. Global Average Temperature", fontsize=16)
plt.show()
```



[21]:
```
plt.plot(global_data['year'], global_avg, label='Global')

plt.legend()
plt.xlabel("Years",  fontsize=16)
plt.ylabel("Temperature",  fontsize=16)
plt.title("Global AVG Temperature",  fontsize=16)
plt.show();
```



[22]:
```
plt.plot(city_data['year'], city_avg, label='Alex')

plt.legend()
plt.xlabel("Years",  fontsize=16)
plt.ylabel("Temperature",  fontsize=16)
plt.title("Alexandria AVG Temperature", fontsize=16)
plt.show();
```



1.2 MAKING OBSERVATIONS:

1- The local temperature in Alexandria, in 1800 Was greatly high as before 1950. What Was the Problem then? There were no oil mining yet And Higher than the global average.

2- After 1800, temperature in alexandria decresed greatly.

3- After 1930, the temperature began to increase fastly with time.

4- The Local Temprature in Alexandria was higher than the global temprature before 1800.

5- The Global temperature started to raise since the middle of 1800.

6- The Highest inflation was before 2000 over the global average.

7- The Highest inflation was before 2000 over the local average.

[ ]: