

Exploring Weather Trends - Project

Summary

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

Outline

- Tools used :
 - **Excel - SQL**
- Moving average Calculation:
 - Decided to make the moving average one for both Global and city Temperature with a decade basis.
- Key considerations when decided how to visualize the trends:
 - I removed all Global Temp before **1808** as there are no data for my nearest largest city (Cairo) and after **2013** for the same reason.

Extract the data

- Tool used for extracting data : **SQL**
- SQL query to extract the city level data and then Export to CSV.

The screenshot displays a SQL query interface. On the left, under the 'Input' tab, a schema for 'city_data' is shown with columns: year, city, country, and avg_temp. The main area contains a SQL query:

```
1 SELECT *
2 FROM city_data
3 WHERE city= 'Cairo' AND country= 'Egypt'
```

Below the query, a green bar indicates 'Success!' and a blue 'EVALUATE' button is present. The 'Output' section shows '206 results' and a 'Download CSV' link. A table of results is displayed below:

year	city	country	avg_temp
1808	Cairo	Egypt	17.11
1809	Cairo	Egypt	19.87
1810	Cairo	Egypt	19.93
1811	Cairo	Egypt	20.00

- SQL query to extract the global data and then Export to CSV.

Input

HISTORY ▾

MENU ▾

SCHEMA

city

country

global_data

year

avg_temp

1 SELECT *

2 FROM global_data

3

Success!

EVALUATE

Output 266 results

Download CSV

year	avg_temp
1750	8.72
1751	7.98
1752	5.78
1753	8.39

Open up the CSV

- Tool used for Opening up CSV: Excel

City Temp		Global Temp	
year,city,country,avg_temp	1	A	
1808,Cairo,Egypt,17.11	2	year,avg_temp	1
1809,Cairo,Egypt,19.87	3	1750,8.72	2
1810,Cairo,Egypt,19.93	4	1751,7.98	3
1811,Cairo,Egypt,20.00	5	1752,5.78	4
1812,Cairo,Egypt,19.93	6	1753,8.39	5
1813,Cairo,Egypt,20.51	7	1754,8.47	6
1814,Cairo,Egypt,20.43	8	1755,8.36	7
1815,Cairo,Egypt,20.30	9	1756,8.85	8
1816,Cairo,Egypt,20.51	10	1757,9.02	9
1817,Cairo,Egypt,21.88	11	1758,6.74	10
1818,Cairo,Egypt,11.60	12	1759,7.99	11
1819,Cairo,Egypt,20.31	13	1760,7.19	12
1820,Cairo,Egypt,20.58	14	1761,8.77	13
1821,Cairo,Egypt,20.63	15	1762,8.61	14
1822,Cairo,Egypt,20.72	16	1763,7.50	15
1823,Cairo,Egypt,20.71	17	1764,8.40	16
1824,Cairo,Egypt,21.44	18	1765,8.25	17
1825,Cairo,Egypt,21.00	19	1766,8.41	18
1826,Cairo,Egypt,20.94	20	1767,8.22	19
1827,Cairo,Egypt,21.63	21	1768,6.78	20
1828,Cairo,Egypt,20.99	22	1769,7.69	21
1829,Cairo,Egypt,20.91	23	1770,7.69	22
1830,Cairo,Egypt,21.25	24	1771,7.85	23
1831,Cairo,Egypt,20.52	25	1772,8.19	24
1832,Cairo,Egypt,20.20	26	1773,8.22	25
1833,Cairo,Egypt,20.81	27	1774,8.77	26
1834,Cairo,Egypt,20.69	28	1775,9.18	27
		1776,8.30	28

- Started by converting CSV File to Excel File and separating data into different Columns then the alignment as follow:

City Temp					Global Temp		
	A	B	C	D		A	B
1	Year	city	country	City avg_temp	1	year	Global avg_temp
2	1808	Cairo	Egypt	17.11	2	1750	8.72
3	1809	Cairo	Egypt	19.87	3	1751	7.98
4	1810	Cairo	Egypt	19.93	4	1752	5.78
5	1811	Cairo	Egypt	20	5	1753	8.39
6	1812	Cairo	Egypt	19.93	6	1754	8.47
7	1813	Cairo	Egypt	20.51	7	1755	8.36
8	1814	Cairo	Egypt	20.43	8	1756	8.85
9	1815	Cairo	Egypt	20.3	9	1757	9.02
10	1816	Cairo	Egypt	20.51	10	1758	6.74
11	1817	Cairo	Egypt	21.88	11	1759	7.99
12	1818	Cairo	Egypt	11.6	12	1760	7.19
13	1819	Cairo	Egypt	20.31	13	1761	8.77
14	1820	Cairo	Egypt	20.58	14	1762	8.61
15	1821	Cairo	Egypt	20.63	15	1763	7.5
16	1822	Cairo	Egypt	20.72	16	1764	8.4
17	1823	Cairo	Egypt	20.71	17	1765	8.25
18	1824	Cairo	Egypt	21.44	18	1766	8.41
19	1825	Cairo	Egypt	21	19	1767	8.22
20	1826	Cairo	Egypt	20.94	20	1768	6.78
21	1827	Cairo	Egypt	21.63	21	1769	7.69
22	1828	Cairo	Egypt	20.99	22	1770	7.69
23	1829	Cairo	Egypt	20.91	23	1771	7.85
24	1830	Cairo	Egypt	21.25	24	1772	8.19
25	1831	Cairo	Egypt	20.52	25	1773	8.22
26	1832	Cairo	Egypt	20.2	26	1774	8.77
27	1833	Cairo	Egypt	20.81	27	1775	9.18
28	1834	Cairo	Egypt	20.69	28	1776	8.3

Create a line chart

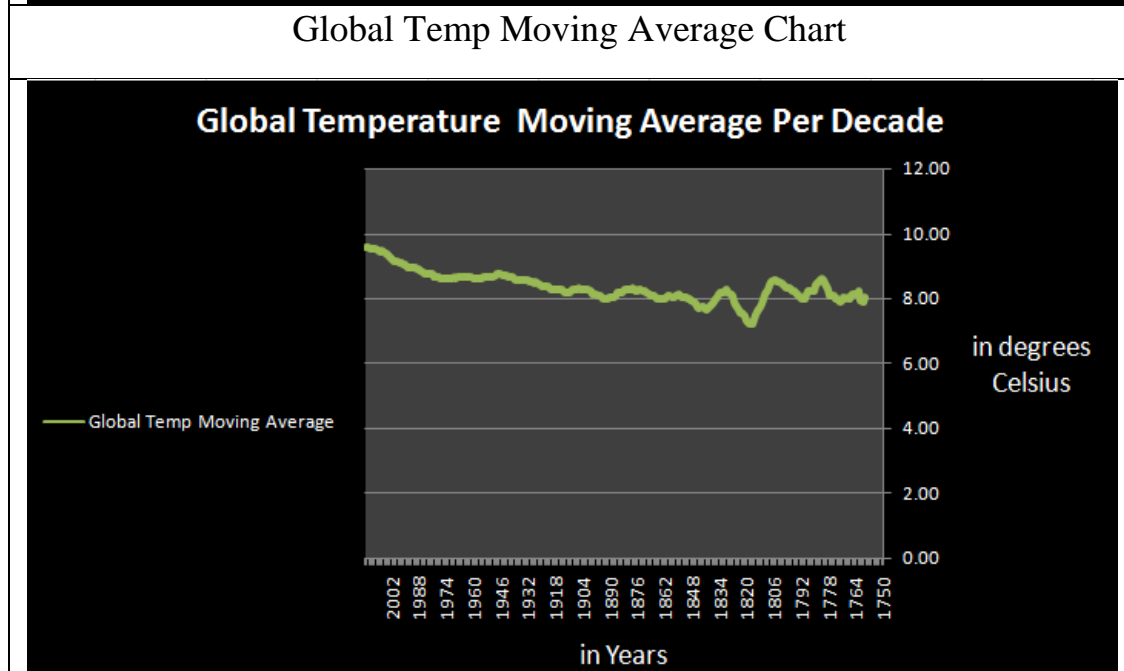
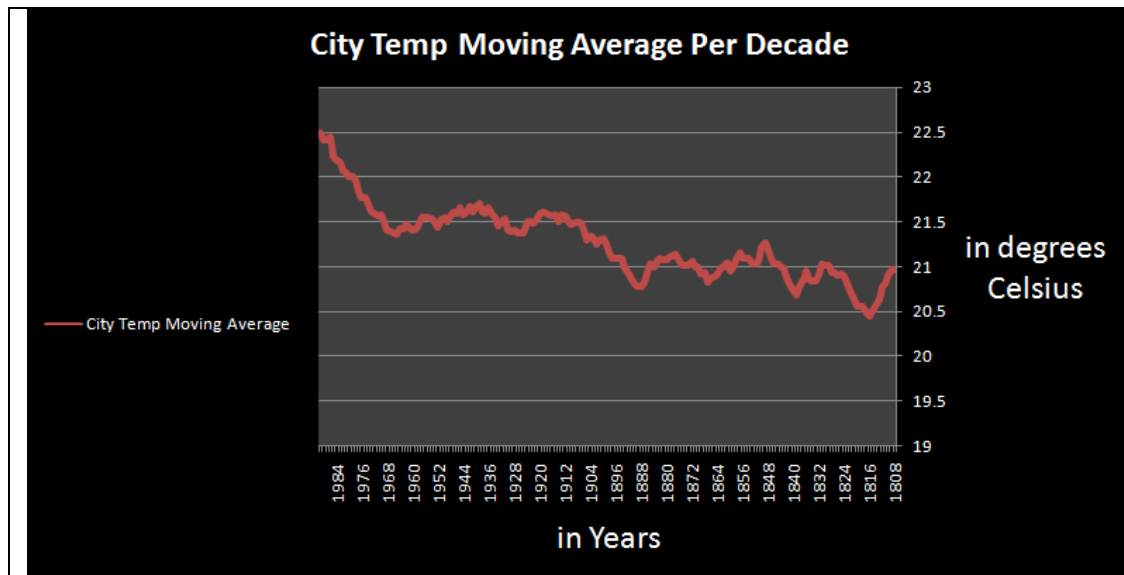
- Started by calculating moving average as mentioned above in outline on a decade basis

City Temp Moving Average	Global Temp Moving Average
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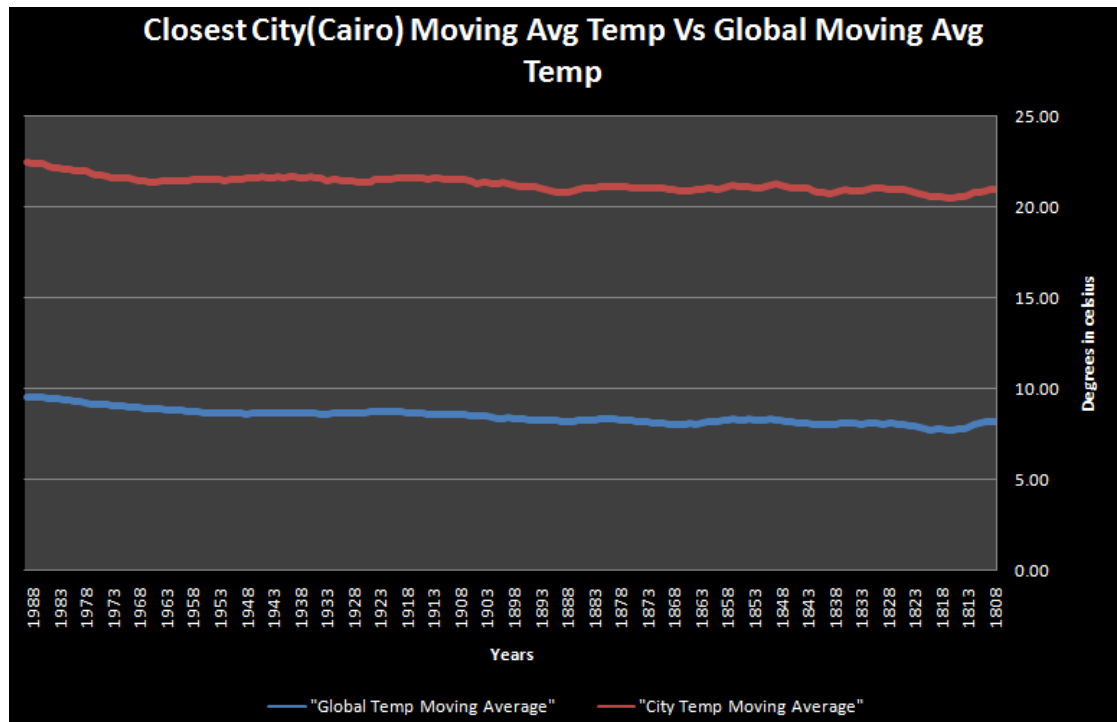
	A	B	C	D	E		A	B	C
1	Year	city	country	City avg_temp	10 Y Moving Average City Temp	1	Year	Global avg_temp	10 Y Moving Average Global Temperature
2	1808	Cairo	Egypt	17.11		2	1750	8.72	
3	1809	Cairo	Egypt	19.87		3	1751	7.98	
4	1810	Cairo	Egypt	19.93		4	1752	5.78	
5	1811	Cairo	Egypt	20		5	1753	8.39	
6	1812	Cairo	Egypt	19.93		6	1754	8.47	
7	1813	Cairo	Egypt	20.51		7	1755	8.36	
8	1814	Cairo	Egypt	20.43		8	1756	8.85	
9	1815	Cairo	Egypt	20.3		9	1757	9.02	
10	1816	Cairo	Egypt	20.51		10	1758	6.74	
11	1817	Cairo	Egypt	21.88	20.047	11	1759	7.99	8.03
12	1818	Cairo	Egypt	11.6	19.496	12	1760	7.19	7.877
13	1819	Cairo	Egypt	20.31	19.54	13	1761	8.77	7.956
14	1820	Cairo	Egypt	20.58	19.605	14	1762	8.61	8.239
15	1821	Cairo	Egypt	20.63	19.668	15	1763	7.5	8.15
16	1822	Cairo	Egypt	20.72	19.747	16	1764	8.4	8.143
17	1823	Cairo	Egypt	20.71	19.767	17	1765	8.25	8.132
18	1824	Cairo	Egypt	21.44	19.868	18	1766	8.41	8.088
19	1825	Cairo	Egypt	21	19.938	19	1767	8.22	8.008
20	1826	Cairo	Egypt	20.94	19.981	20	1768	6.78	8.012
21	1827	Cairo	Egypt	21.63	19.956	21	1769	7.69	7.982
22	1828	Cairo	Egypt	20.99	20.895	22	1770	7.69	8.032
23	1829	Cairo	Egypt	20.91	20.955	23	1771	7.85	7.94
24	1830	Cairo	Egypt	21.25	21.022	24	1772	8.19	7.898
25	1831	Cairo	Egypt	20.52	21.011	25	1773	8.22	7.97
26	1832	Cairo	Egypt	20.2	20.959	26	1774	8.77	8.007
27	1833	Cairo	Egypt	20.81	20.969	27	1775	9.18	8.1

- Making a chart for each one of them alone

City Temp Moving Average Chart



- Gathering the two temperatures in one chart for comparison after removing all Global Temp before **1808** as there are no data for my nearest largest city (Cairo) and after **2013** for the same reason as mentioned above



Observations

- My city Cairo is a lot hotter than the global avg Temperature by more than the double over 200 years
- The change in temperature in Cairo is sharper than the global average as we will notice in the charts above.
- The world is getting hotter and Cairo even more.
- Over 200 years the temperature moving avg has raised about 2 full degrees for both my city (Cairo) and global avg.