

First Project: Explore Weather Trends

Extract the data:

-SQL query to extract the city level data:

```
select avg_temp, city ,year
```

```
from city_data
```

```
where city= 'Mecca'
```

The screenshot shows a SQL query interface with a schema on the left and a query editor on the right. The schema includes tables: city_data, city_list, and global_data. The query editor contains the following SQL query:

```
1 select avg_temp, city ,year
2 from city_data
3 where city= 'Mecca'
```

Below the query editor, there is a "Success!" message and an "EVALUATE" button. The output section shows 171 results, with a "Download CSV" link. The output table has columns: avg_temp, city, and year.

avg_temp	city	year
25.16	Mecca	1843
19.05	Mecca	1844
22.46	Mecca	1845
	Mecca	1846
	Mecca	1847
	Mecca	1848
	Mecca	1849

-SQL query to extract the global data:

```
select * from global_data
```

The screenshot shows a SQL query interface with a schema on the left and a query editor on the right. The schema includes tables: city_data, city_list, and global_data. The query editor contains the following SQL query:

```
1 select * from global_data
2
3
```

Below the query editor, there is a "Success!" message and an "EVALUATE" button. The output section shows 266 results, with a "Download CSV" link. The output table has columns: year and avg_temp.

year	avg_temp
1750	8.72
1751	7.98
1752	5.78
1753	8.39
1754	8.47
1755	8.36
1756	8.85

Open up the CSV:

I used excel.

Create a line chart:

I was not able to compute the moving average immediately because I have missing values in my city data (Mecca). So first, I compute the mean of the average temperature (Mecca) and then I put the mean result in the place of all the missing values.

	A	B	C		A	B	C
1	avg_temp	city	year	1	avg_temp	city	year
2	25.16	Mecca	1843	2	25.16	Mecca	1843
3	19.05	Mecca	1844	3	19.05	Mecca	1844
4	22.46	Mecca	1845	4	22.46	Mecca	1845
5		Mecca	1846	5	25.6	Mecca	1846
6		Mecca	1847	6	25.6	Mecca	1847
7		Mecca	1848	7	25.6	Mecca	1848
8		Mecca	1849	8	25.6	Mecca	1849
9		Mecca	1850	9	25.6	Mecca	1850
10		Mecca	1851	10	25.6	Mecca	1851
11		Mecca	1852	11	25.6	Mecca	1852
12		Mecca	1853	12	25.6	Mecca	1853
13		Mecca	1854	13	25.6	Mecca	1854
14		Mecca	1855	14	25.6	Mecca	1855
15		Mecca	1856	15	25.6	Mecca	1856
16		Mecca	1857	16	25.6	Mecca	1857
17		Mecca	1858	17	25.6	Mecca	1858
18		Mecca	1859	18	25.6	Mecca	1859
19		Mecca	1860	19	25.6	Mecca	1860
20	23.98	Mecca	1861	20	23.98	Mecca	1861
21	24.13	Mecca	1862	21	24.13	Mecca	1862
22	22.87	Mecca	1863	22	22.87	Mecca	1863
23	25.43	Mecca	1864	23	25.43	Mecca	1864

-Moving Average:

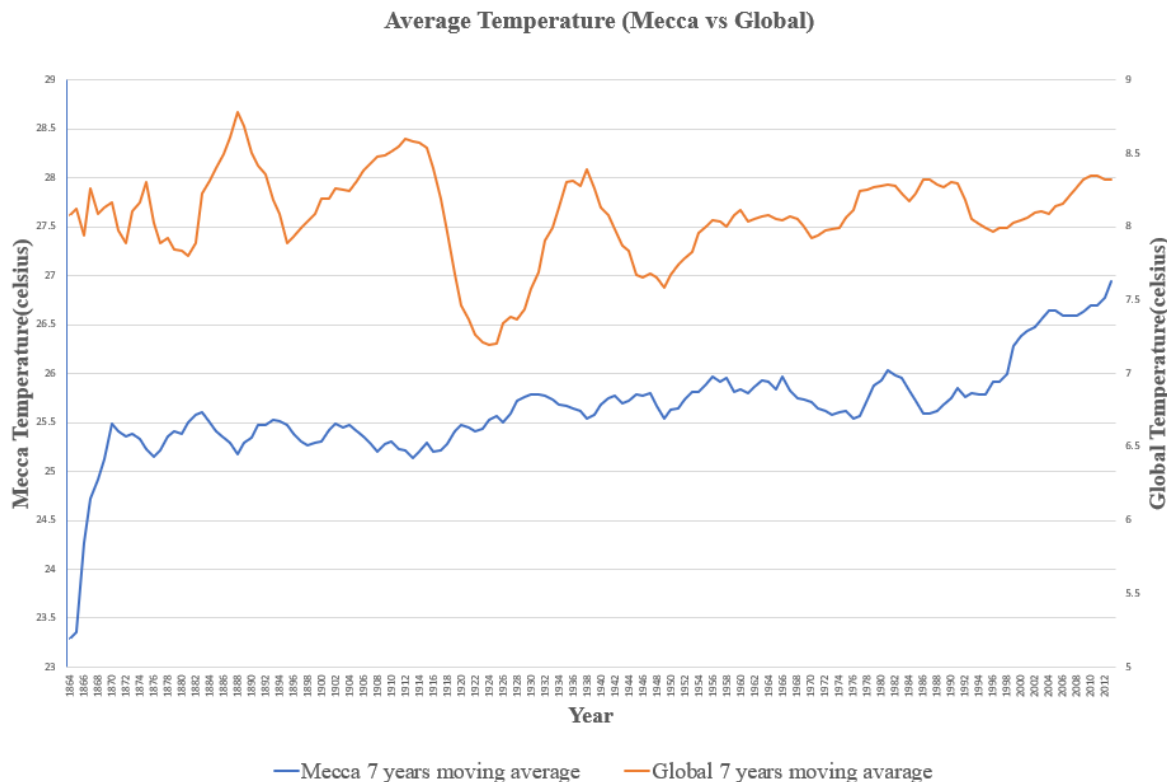
I calculated the moving averages of the first 7 years in both average temperature of mecca and global

A	B	C	D	E	F	G	H
avg_temp	city	year	avg_temp	year	Mecca_tei	global_temperature	
25.16	Mecca	1843	8.72	1750			
19.05	Mecca	1844	7.98	1751			
22.46	Mecca	1845	5.78	1752			
25.6	Mecca	1846	8.39	1753			
25.6	Mecca	1847	8.47	1754			
25.6	Mecca	1848	8.36	1755			
25.6	Mecca	1849	8.85	1756	24.15286	8.078571	
25.6	Mecca	1850	9.02	1757	24.21571	8.121429	
25.6	Mecca	1851	6.74	1758	25.15143	7.944286	
25.6	Mecca	1852	7.99	1759	25.6	8.26	
25.6	Mecca	1853	7.19	1760	25.6	8.088571	
25.6	Mecca	1854	8.77	1761	25.6	8.131429	
25.6	Mecca	1855	8.61	1762	25.6	8.167143	
25.6	Mecca	1856	7.5	1763	25.6	7.974286	
25.6	Mecca	1857	8.4	1764	25.6	7.885714	
25.6	Mecca	1858	8.25	1765	25.6	8.101429	
25.6	Mecca	1859	8.41	1766	25.6	8.161429	
25.6	Mecca	1860	8.22	1767	25.6	8.308571	
23.98	Mecca	1861	6.78	1768	25.36857	8.024286	
24.13	Mecca	1862	7.69	1769	25.15857	7.892857	
22.87	Mecca	1863	7.69	1770	24.76857	7.92	
25.43	Mecca	1864	7.85	1771	24.74429	7.841429	
25.6	Mecca	1865	8.19	1772	24.74429	7.832857	
25.42	Mecca	1866	8.22	1773	24.71857	7.805714	
25.62	Mecca	1867	8.77	1774	24.72143	7.884286	
25.3	Mecca	1868	9.18	1775	24.91	8.227143	
25.65	Mecca	1869	8.3	1776	25.12714	8.314286	
25.35	Mecca	1870	8.26	1777	25.48143	8.395714	

Due to the year beginning differences between Mecca and the global, samples of some years were taken from 1864 to 2013, so only the moving average of these years was used.

	A	B	C
1	Mecca_te	Global_te	Year
2	23.2971	8.07857	1864
3	23.36	8.12143	1865
4	24.27	7.94429	1866
5	24.7214	8.26	1867
6	24.91	8.08857	1868
7	25.1271	8.13143	1869
8	25.4814	8.16714	1870
9	25.4157	7.97429	1871
10	25.3586	7.88571	1872
11	25.38	8.10143	1873
12	25.3371	8.16143	1874
13	25.2271	8.30857	1875
14	25.1529	8.02429	1876
15	25.2186	7.89286	1877
16	25.3571	7.92	1878
17	25.41	7.84143	1879
18	25.3886	7.83286	1880
19	25.4943	7.80571	1881
20	25.5743	7.88429	1882
21	25.6071	8.22714	1883
22	25.4957	8.31429	1884
23	25.4086	8.39571	1885
24	25.3457	8.49429	1886
25	25.2971	8.60714	1887
26	25.1757	8.78	1888
27	25.2886	8.68429	1889
28	25.35	8.50143	1890
29	25.4714	8.41286	1891
30	25.48	8.35571	1892
31	25.5214	8.18714	1893
32	25.51	8.08429	1894
33	25.4743	7.88429	1895
34	25.3829	7.93429	1896
35	25.3086	7.99571	1897
36	25.2671	8.03857	1898
37	25.2929	8.09143	1899
38	25.3043	8.19571	1900
39	25.4171	8.19143	1901
40	25.4829	8.26286	1902
41	25.4529	8.24857	1903
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-City's temperatures with the global temperatures line chart:



Note: to make the average temperature trend clearer in the line chart for helping me in my observations, I did the bounds of average temperature from 23.0 to 29 and I reduce the units from 0.5 to 0.1.

Observations:

-The average temperature from 1864 to 2013 for mecca and the globe are 25.717, 8.609 Celsius respectively, so that's mean mecca is hotter than the global average by 17.106 Celsius.

- In 1864 Mecca the temperature increased significantly from 23.29 to 25.49 ° C, and in 1870 the temperature began to rise and fall almost constant, between 25-26 ° C. While the world temperature was rising and falling almost steadily from 1864 to 1881, but from the beginning of 1883 to 1946 there was a significant decrease and rise in temperatures, and the temperature returned to rise and fall almost steadily from the beginning of 1954. This indicates that the world and mecca have started to decrease and rise in temperature almost constant since 1958.

- The average temperature in Mecca rises and falls, and the changes that occur are almost constant, while the average temperature in the world was rising and falling almost steadily, but there were some noticeable changes from 1883 to 1946 with different degrees of temperature, but from Beginning in 1958, the Celsius temperature began to rise and fall almost steadily.

-The temperature seems to be rising, because the average temperature in mecca and the globe has been rising steadily in the last few decades.