

Explore Weather Trends Project

The goal of this project is to create a visualization and prepare a write-up describing the similarities and differences between global temperature trends and temperature trends in the closest big city to where I live, which is Riyadh.

Steps:

Step 1: Extract the data from the database.

Write a SQL query to extract the city level data. Export to CSV.

```
SELECT year, avg_temp FROM city_data WHERE country='Saudi Arabia' AND city='Riyadh';
```

	A	B
1	year	avg_temp
2	1843	24.74
3	1844	15.45
4	1845	20.82
5	1846	
6	1847	
7	1848	24.56
8	1849	24.8
9	1850	24.34
10	1851	25.03
11	1852	24.85
12	1853	24.93
13	1854	24.72
14	1855	24.92
15	1856	24.57
16	1857	24.26
17	1858	25.01
18	1859	24.95
19	1860	24.94
20	1861	24.13
21	1862	23.77
22	1863	24.28
23	1864	25.03
24	1865	25.23
25	1866	24.92

Fig. 1: Extracted Data for Riyadh Temperature

Write a SQL query to extract the global data. Export to CSV.

```
SELECT year, avg_temp FROM global_data;
```

	year	avg_temp
2	1750	8.72
3	1751	7.98
4	1752	5.78
5	1753	8.39
6	1754	8.47
7	1755	8.36
8	1756	8.85
9	1757	9.02
10	1758	6.74
11	1759	7.99
12	1760	7.19
13	1761	8.77
14	1762	8.61
15	1763	7.5
16	1764	8.4
17	1765	8.25
18	1766	8.41
19	1767	8.22
20	1768	6.78
21	1769	7.69
22	1770	7.69
23	1771	7.85
24	1772	8.19
25	1773	8.22

Fig. 2: Extracted Data for Global Temperature

Step 2: Create a line chart that compares your city's temperatures with global temperatures.

I noticed that in the Riyadh dataset, there are two missing data as shown below.

A	B
year	avg_temp
1846	
1847	

Fig. 3: Missing Data

Also, in the Riyadh dataset, the year column starts from 1843 and ends in 2013, whereas in the Global dataset, the year column starts from 1750 and ends in 2015. So, in order to compare the two datasets, I deleted all the years before 1848 and after 2013 to have consistent data and fix the missing data problem.

To compare the global and local (Riyadh) temperatures, I merged the two datasets into one Excel sheet and calculated the 5-year moving average using the AVERAGE function to smooth out the lines and making trends more observable, as shown in the figures below.

	A	B	C	D	E	F
1	Global Temperature Trends			Local Temperature Trends		
2	year	avg_temp	Global 5-year MA	year	avg_temp	Riyadh 5-year MA
3	1848	7.98		1848	24.56	
4	1849	7.98		1849	24.8	
5	1850	7.9		1850	24.34	
6	1851	8.18		1851	25.03	
7	1852	8.1	8.028	1852	24.85	24.716
8	1853	8.04	8.04	1853	24.93	24.79
9	1854	8.21	8.086	1854	24.72	24.774
10	1855	8.11	8.128	1855	24.92	24.89
11	1856	8	8.092	1856	24.57	24.798
12	1857	7.76	8.024	1857	24.26	24.68
13	1858	8.1	8.036	1858	25.01	24.696
14	1859	8.25	8.044	1859	24.95	24.742
15	1860	7.96	8.014	1860	24.94	24.746
16	1861	7.85	7.984	1861	24.13	24.658
17	1862	7.56	7.944	1862	23.77	24.56
18	1863	8.11	7.946	1863	24.28	24.414
19	1864	7.98	7.892	1864	25.03	24.43

Fig. 4: Merged Dataset

	A	B	C	D	E	F
1	Global Temperature Trends			Local Temperature Trends		
2	year	avg_temp	Global 5-year MA	year	avg_temp	Riyadh 5-year MA
3	1848	7.98		1848	24.56	
4	1849	7.98		1849	24.8	
5	1850	7.9		1850	24.34	
6	1851	8.18		1851	25.03	
7	1852	8.1	=AVERAGE(B3:B7)	1852	24.85	24.716
8	1853	8.04	AVERAGE(number1, [number2], ...)	1853	24.93	24.79
9	1854	8.21	8.086	1854	24.72	24.774
10	1855	8.11	8.128	1855	24.92	24.89

Fig. 5: 5-Year Moving Average

I created the line charts for Riyadh temperature trends, global temperature trends, and comparison of Riyadh and global temperatures trends using the Riyadh 5-Year MA, Global 5-Year MA, and Year columns, as shown below.

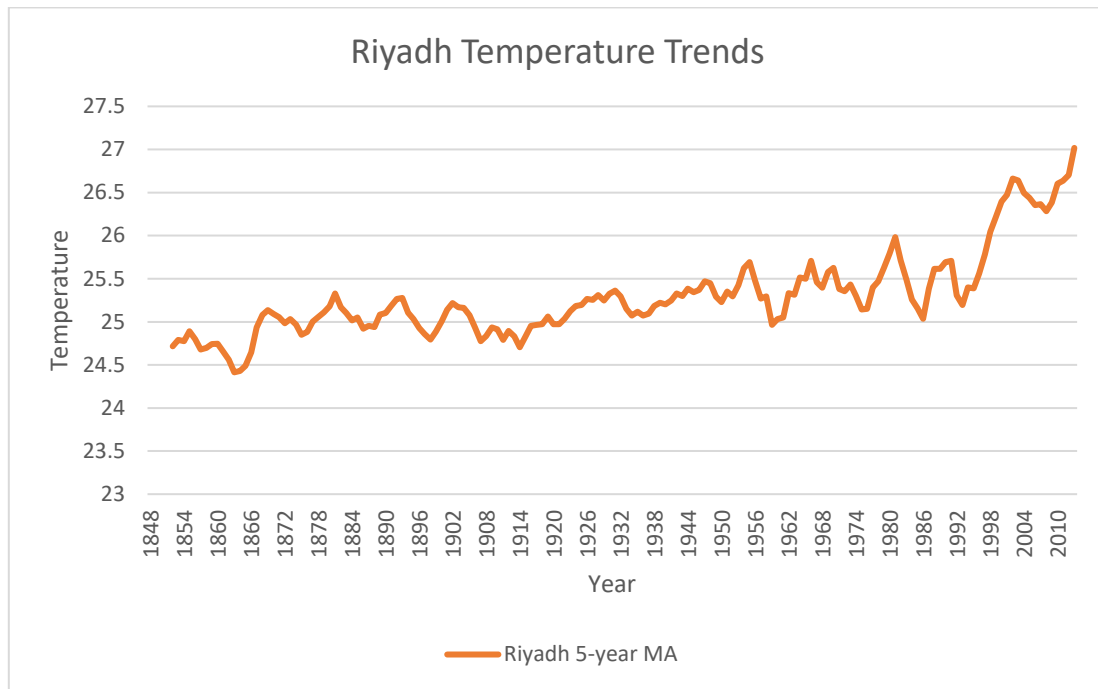


Fig. 6: Riyadh Temperature Trends Line Chart

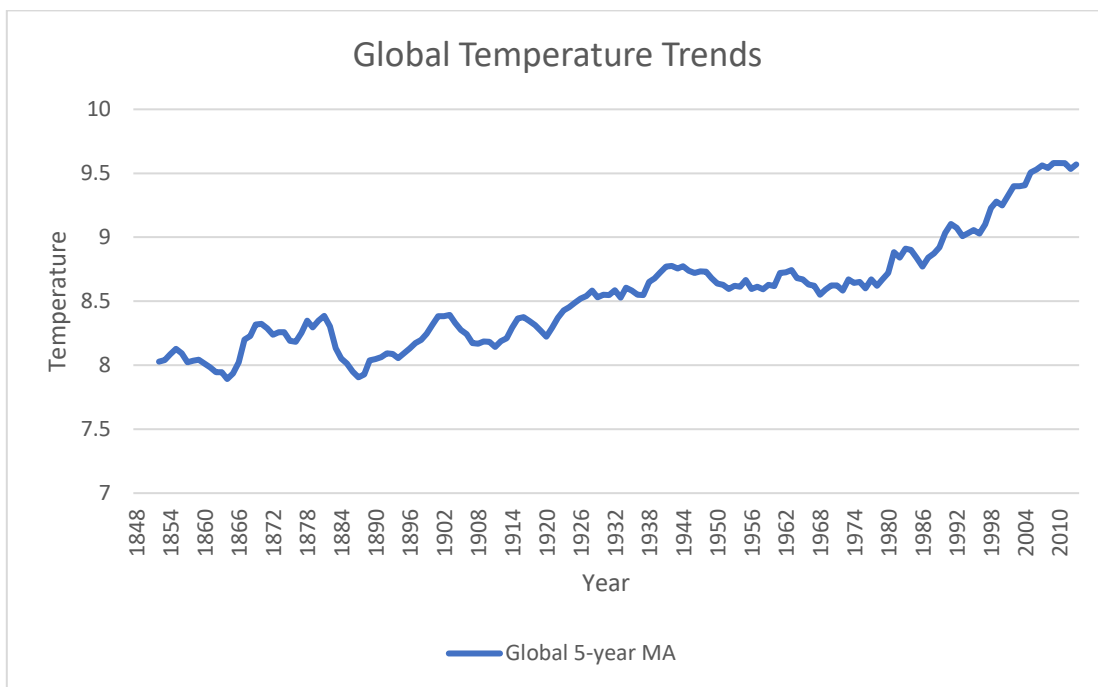


Fig. 7: Global Temperature Trends Line Chart

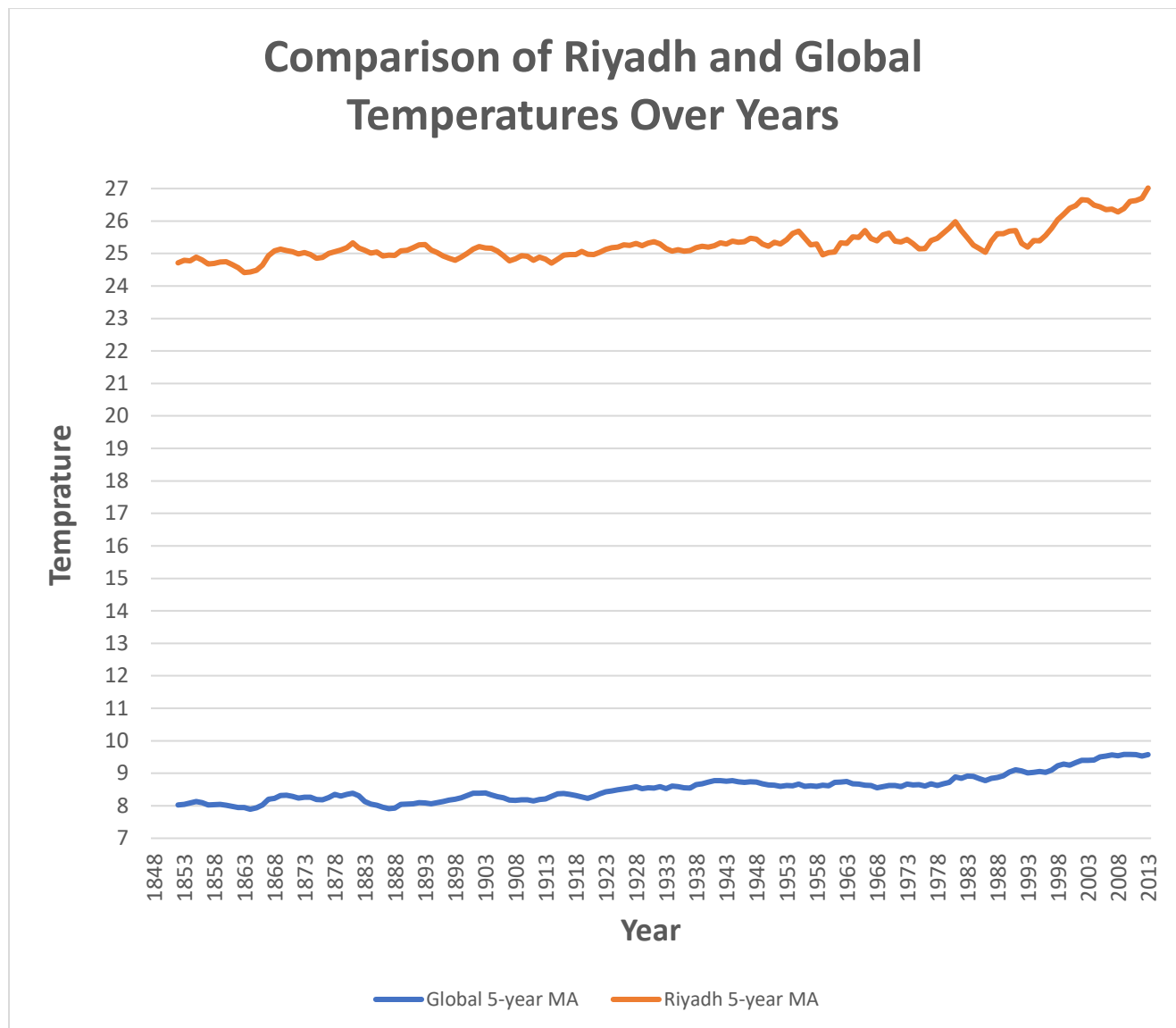


Fig. 8: Comparison of Riyadh and Global Temperatures Over Years

Step 3: Make observations about the similarities and differences between the world averages and your city's averages, as well as overall trends.

From the line chart shown in figure 8, I observed the following:

1. Riyadh's average temperature was hotter compared to the global average temperature from the year 1848 to 2013.
2. Both, Riyadh and global temperatures, are increasing over the years especially at the beginning of the 21st century, which shows the effect of global warming.
3. Riyadh's average temperature has higher increasing rate than the global temperature in the last decade.
4. The global temperature was considerably more consistent than the Riyadh temperature over the years.
5. The overall average temperature of Riyadh was 25.3° and the global average temperature was 8.5°, which means that Riyadh is hotter on average than global by 33.8°.