Explore Weather Trends

Tools

- SQL : To extract data from the temperatures database
- Excel : To calculate moving averages and correlation coefficient, analyze, and visualize the data

Data Extraction

I used the following SQL query to extract both global and Riyadh city temperature data in one table

```
SELECT g.year, g.avg_temp AS global_avg_temp,  c.avg_temp AS city_avg_temp
FROM global_data g, city_data c
WHERE g.year=c.year AND c.city='Riyadh';
```

which results a table that looks like this

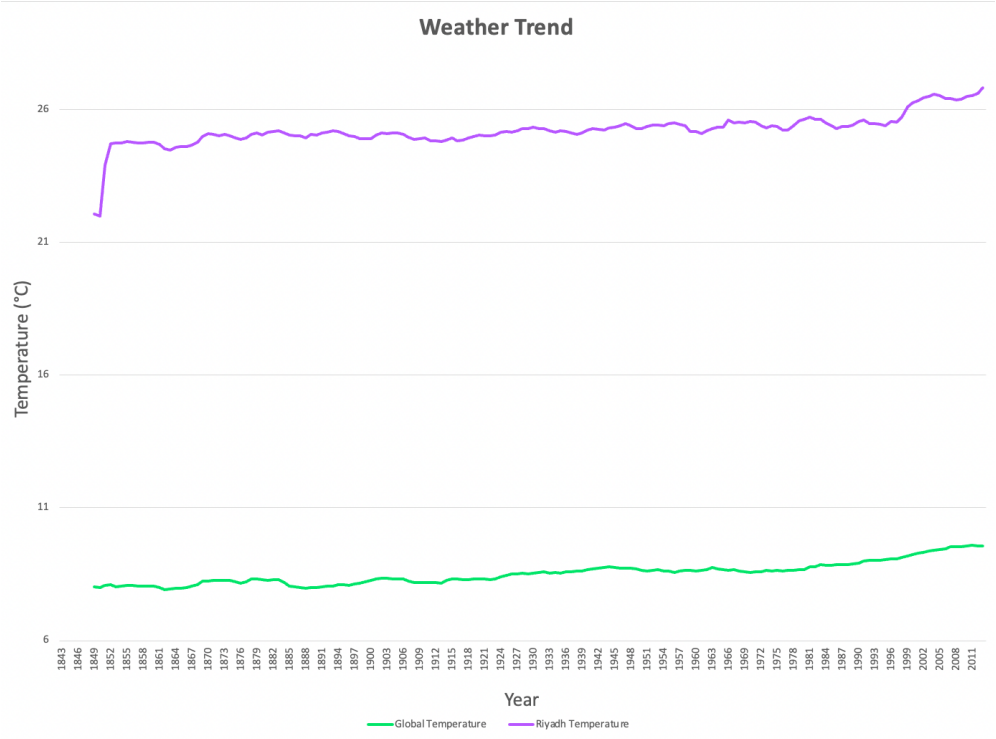
year	global_avg_temp	city_avg_temp
1843	8.17	24.74
1844	7.65	15.45
1845	7.85	20.82

Moving Average

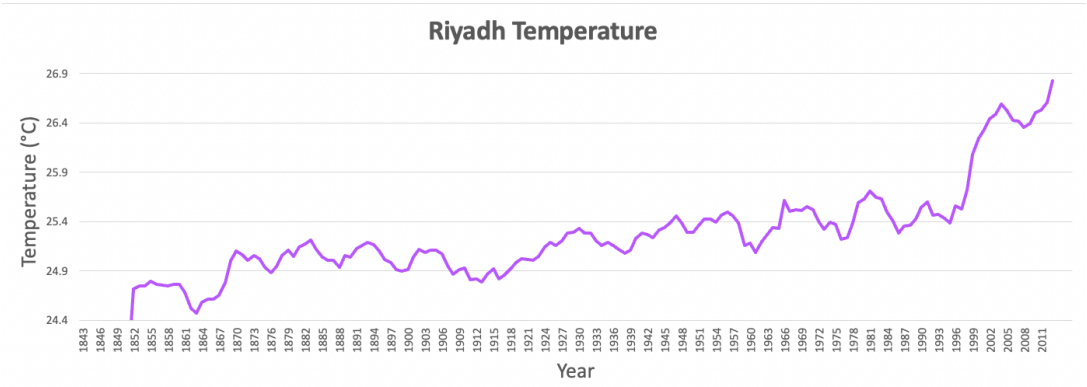
I used the following Excel function to calculate the 7-year moving average of both global and city temperature

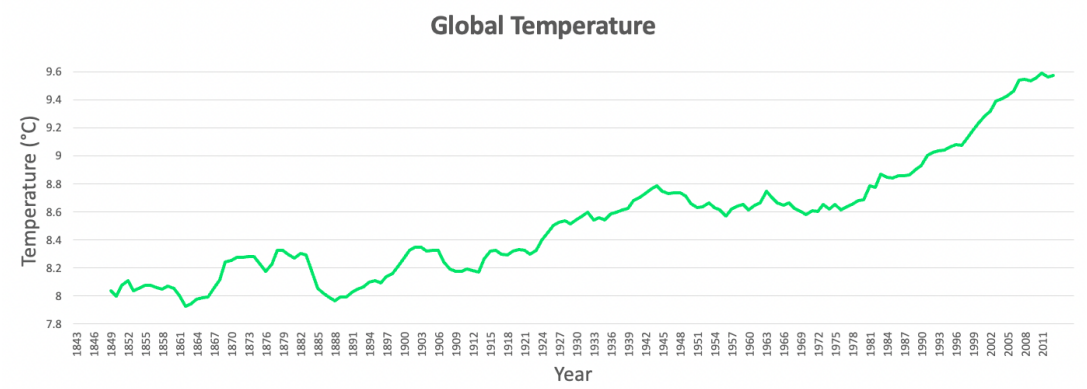
```
=AVERAGE(B2:B8)
=AVERAGE(C2:C8)
```

Visualization



To see more details, we can zoom in by creating two separate charts

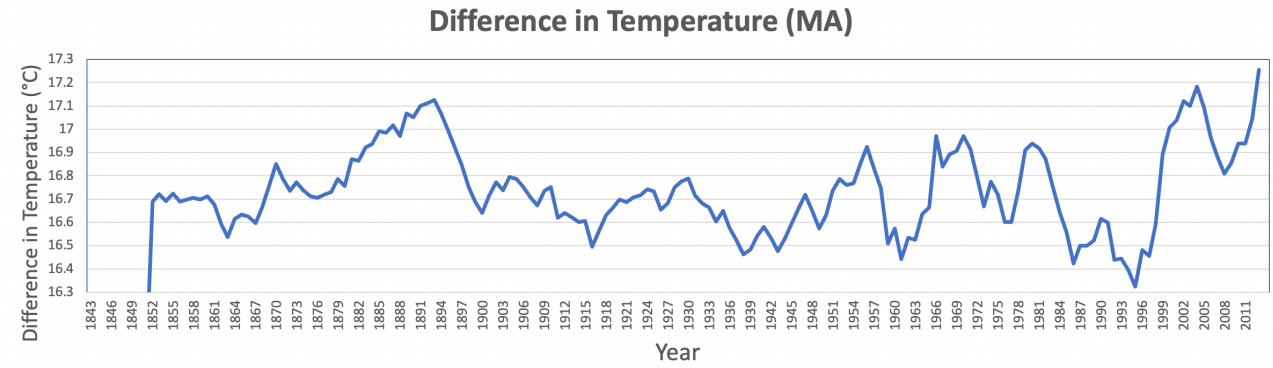




From the above charts, we can clearly see that the temperature is rising both in Riyadh and globally.

Note: Riyadh temperature data is available only for the period between 1843 and 2013, therefore, the analysis was conducted on this period.

The difference between global temperature and Riyadh temperature fluctuates and changes a little bit over the years.



The above chart was created by subtracting global temperature from Riyadh city temperature which results in the difference between them

Observations

- Riyadh temperature is higher than global temperature by an average difference of 16.67 °C.
- The difference between Riyadh temperature and global average temperature changes from year to year by 0.38 °C on average, the minimum difference is 15.41 °C, while the maximum difference is 18.17 °C.
- The change in Riyadh temperature is more volatile, while the change in global average temperature is a little bit slower and more stable.
- The world temperature is indeed rising.
- There is a clear strong spike in temperature in the last two decades.
- The difference between Riyadh temperature and global average temperature has been rising rapidly in the last two decades, which means Riyadh is getting hotter more quickly compared to the global average.

Correlation Coefficient

The Correlation Coefficient of Riyadh temperature and global average temperature is 0.803425063 which indicates strong positive correlation.