UDACITY

Project 01: Exploring Weather Trends

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1. Introduction

This project shows a comparison of temperature trends of the local city which is Riyadh with the overall global temperature trends.This will include exporting data from the database ,calculating the moving average between the year 1843 and 2013 and create a line chart and extracting the findings .

2. Data Export

In order to export data I used different SQL queries:

- To know the nearest local city I used the following code :

```
1        select *  from city_list where country='Saudi Arabia'
```

Figure -1 Query to Export local city data from city-List table

that shows the list of cities in Saudi Arabia ,Riyadh was the nearest city.

- Extract data from the database before eliminating the missing data:

```
1  select  global_data.year as global_Year,global_data.avg_temp as
   global_Temp,city_data.year as Riy_Year,city_data.avg_temp as Riy_Temp
2  from global_data
3   JOIN city_data
4  ON  global_data.year=city_data.year
5  where city_data.city='Riyadh'
```

Figure -2 Query to Extract global and local data from the database

- The code has been modified as seen below to eliminate missing data:

```
select  global_data.year as global_Year,global_data.avg_temp as
global_Temp,city_data.year as Riy_Year,city_data.avg_temp as Riy_Temp
from global_data
 JOIN city_data
ON  global_data.year=city_data.year
where city_data.city='Riyadh'AND city_data.avg_temp!=0

```

Figure -3 Modified SQL query

3. Calculating Moving Average

After exporting and cleaning missing data I calculated 5 years moving average in Excel.The figure below shows the moving average formula.

	A	B	C	D	E	F
	global_year	global_temp	riy_year	riy_temp	GLOBAL MOVING AVERAGE	RIYADH MOVING AVERAGE
	1843	8.17	1843	24.74		
	1844	7.65	1844	15.45		
	1845	7.85	1845	20.82		
	1848	7.98	1848	24.56		
	1849	7.98	1849	.8	=AVERAGE(B2:B6)	22.074
	1850	7.9	1850	24.34	7.872	21.994
	1851	8.18	1851	25.03	7.978	23.91
	1852	8.1	1852	24.85	8.028	24.716
	1853	8.04	1853	24.93	8.04	24.79
	1854	8.21	1854	24.72	8.086	24.774
	1855	8.11	1855	24.92	8.128	24.89
	1856	8	1856	24.57	8.092	24.798
	1857	7.76	1857	24.26	8.024	24.68
	1858	8.1	1858	25.01	8.036	24.696
	1859	8.25	1859	24.95	8.044	24.742
	1860	7.96	1860	24.94	8.014	24.746
	1861	7.85	1861	24.13	7.984	24.658
	1862	7.56	1862	23.77	7.944	24.56
	1863	8.11	1863	24.28	7.946	24.414
	1864	7.98	1864	25.03	7.892	24.43
	1865	8.18	1865	25.23	7.936	24.488
	1866	8.29	1866	24.92	8.024	24.646
	1867	8.44	1867	25.22	8.2	24.936
	1868	8.25	1868	25	8.228	25.08
	1869	8.43	1869	25.3	8.318	25.134
	1870	8.2	1870	25.02	8.322	25.092
	1871	8.12	1871	24.73	8.288	25.054
	1872	8.19	1872	24.87	8.238	24.984
	1873	8.35	1873	25.24	8.258	25.032
	1874	8.43	1874	24.98	8.258	24.968

Figure -4 Calculating the moving average

4. Data visualization

In this part I used line chart to plot the 5 years moving average of weather temperature trend for Riyadh comparing with global weather temperature in order to smooth out the lines.The x axis present the Years and the y axis present the Average Temperature .

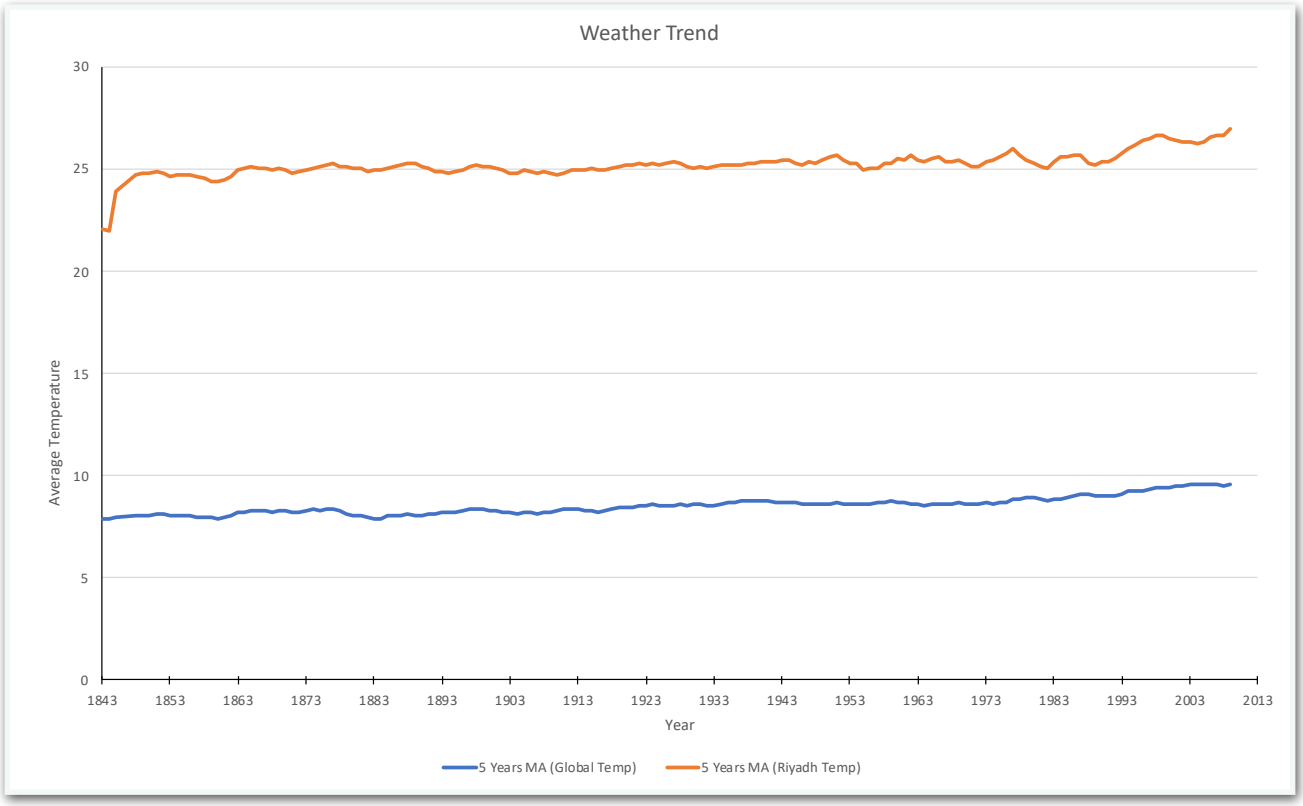

Figure -5 Riyadh and global weather trend

5. Observations

According to the above graph we can observe the following:

- The variance is very big between the the Riyadh weather and global weather where the difference was between 14 and 17 degree in interval between 1843 and 2013.

- The local weather average is much hotter than the global weather average.

- Between 1850 to 1946, the local Riyadh temperature was around 25 degrees then the city has experienced an increase in the 5 year average to reach a temperature of between 25.5 to 27 degrees in the last 16 years from 1998 to 2013.

- According to the overall temperatures average trend ,the temperatures getting increase yearly so the world getting hotter.