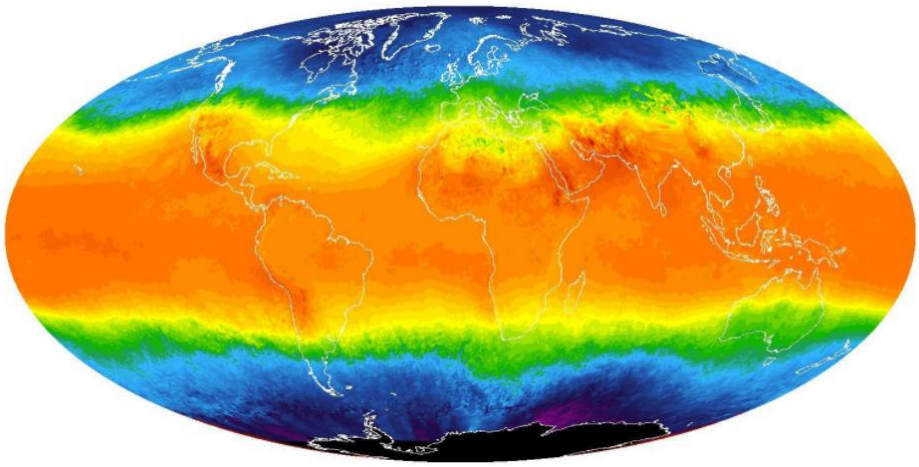

Exploring Weather Trends

Abstract

In this project, I analyze local and global temperature data and compare the temperature trends where I live to overall global temperature trends.

Khadeejah Alaslani

1. **What tools did you use for each step?**
   a) I used SQL query to extract the data from database.
      i. Global data:

```
SELECT *

FROM global_data;
```

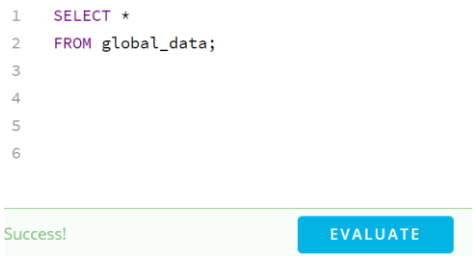

Figure 1 SQL query Global data

      ii. City data:

```
SELECT year, city, avg_temp

FROM city_data

WHERE city = 'Abu Dhabi';
```

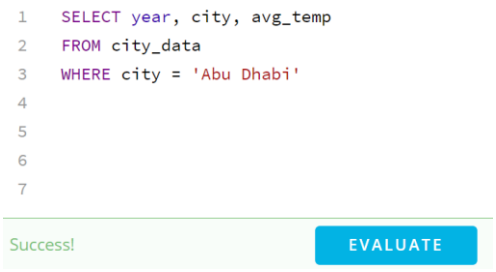

Figure 2 SQL query City data

   b) I exported the data to CSV files using 

link.
   c) I used MS Excel for the analysis.

2. **How did you calculate the moving average?**

   I tried 10, 20 year moving average to define which average is better for smooth line chart.

I calculated moving average (MA) by using Excel function AVERAGE.

E2 =AVERAGE(D2:D11)

	A	B	D	E
1	year	city	avg_temp	avg_10_temp
2	1990	Abu Dhabi	11	27.111
3	1991	Abu Dhabi	26.46	27.167
4	1992	Abu Dhabi	26.1	27.303
5	1993	Abu Dhabi	27.02	27.493
6	1994	Abu Dhabi	27.25	27.603
7	1995	Abu Dhabi	26.75	27.685
8	1996	Abu Dhabi	27.2	27.8
9	1997	Abu Dhabi	26.87	27.874
10	1998	Abu Dhabi	28.19	27.995

Figure 3 Moving Average 10 Year

year	city	avg_temp	avg_10_temp	avg_20_temp
1990	Abu Dhabi	27.11	27.111	=AVERAGE(D2:D21)
1991	Abu Dhabi	26.46	27.167	27.596
1992	Abu Dhabi	26.1	27.303	27.6855
1993	Abu Dhabi	27.02	27.493	27.8035
1994	Abu Dhabi	27.25	27.603	27.853
1995	Abu Dhabi	26.75	27.685	27.88473684
1996	Abu Dhabi	27.2	27.8	27.94777778
1997	Abu Dhabi	26.87	27.874	27.99176471

Figure 4 Moving Average 20 Year

3. What were your key considerations when deciding how to visualize the trends?

The key consideration was to determine the timeframe for data visualization looking at Abu Dhabi temperature and global temperature in the period between 1990-2013.

I used Pivot table to calculate Max, Min and Average.

Avg_ temp_of Global	
Average	9.367916667
Max	9.73
Min	8.84

Avg_10Year temp_of Global	
Average	9.457621362
Max	9.61
Min	9.153

Avg_20Year temp_of Global	
Average	9.506449074
Max	9.61
Min	9.3245

Avg_temp_of city	
Average	27.65625
Max	28.69
Min	26.1

Avg 10Year_temp_of city	
Average	27.91245833
Max	28.3525
Min	27.111

Avg 20Year_temp_of city	
Average	28.0215915
Max	28.3525
Min	27.517

Figure 5 Pivot table

Also, I calculated The Global and Local annual change percentage:

J	K
Difference in Global	avg_glob
=(K3-K2)/K3	9.23
-4%	9.18
0%	8.84
2%	8.87
3%	9.04
-3%	9.35
2%	9.04
3%	9.2
-2%	9.52
-1%	9.29

D	E
Difference in city	avg_temp
=(E3-E2)/E3	27.11
-1%	26.46
3%	26.1
1%	27.02
-2%	27.25
2%	26.75
-1%	27.2
5%	26.87
0%	28.19
-2%	28.16
1%	27.67
1%	27.82
0%	28

Figure 6 Global and Local annual change percentage

Analysis and Observation

- Global average temperature is between 9.36 to 9.50 Degree Celsius but Abu Dhabi city average temperature is between 27.65 to 28.02 Degree Celsius.
- When I compared the global average temperature and Abu Dhabi city average temp, I found Abu Dhabi is hotter than global average temp.
- The difference has been consistent over time according to the table of difference and the graph (7_10).
- I have plotted Line chart for global data and Abu Dhabi city separately to observe difference between Global Average Temperature.

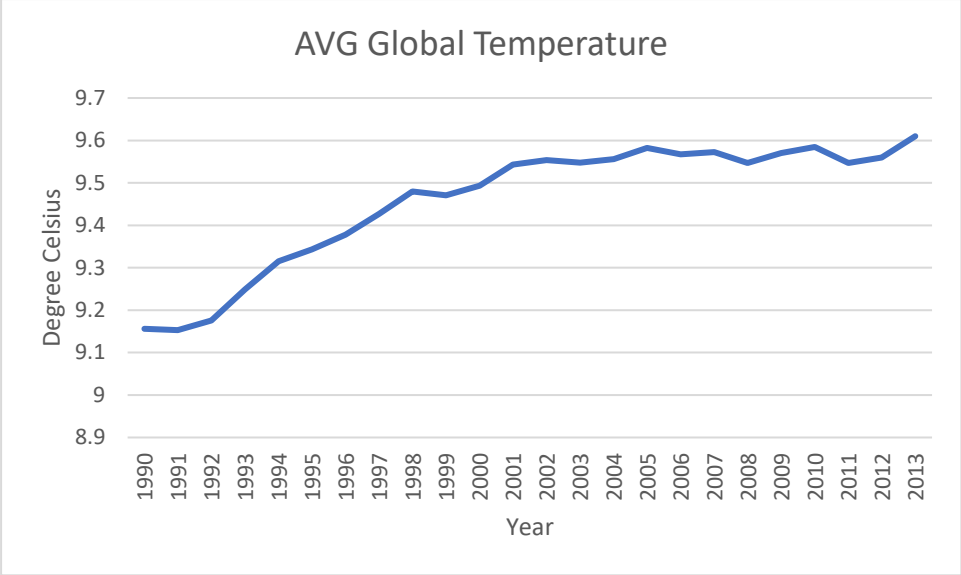

Figure 7 AVG Global Temperature

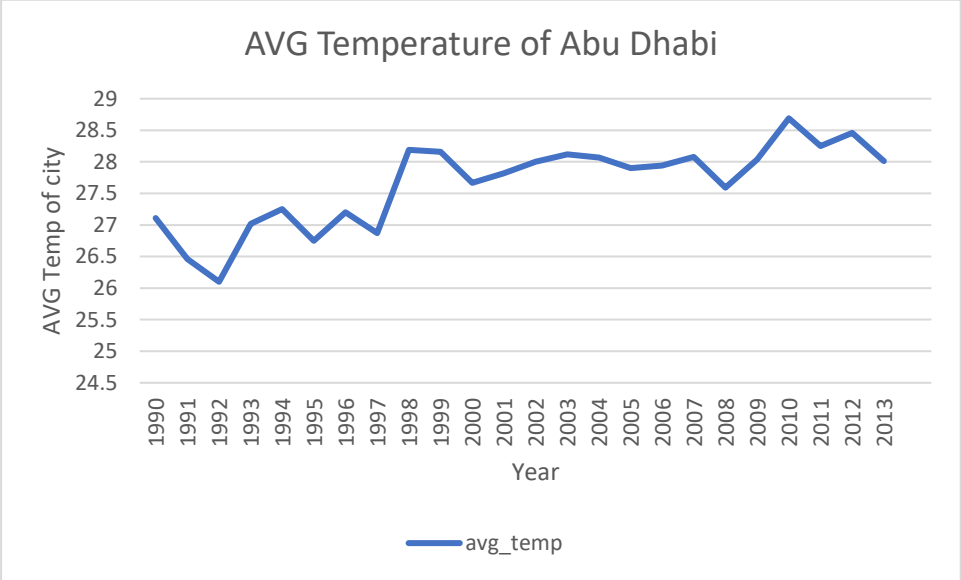

Figure 8 AVG Temperature of Abu Dhabi

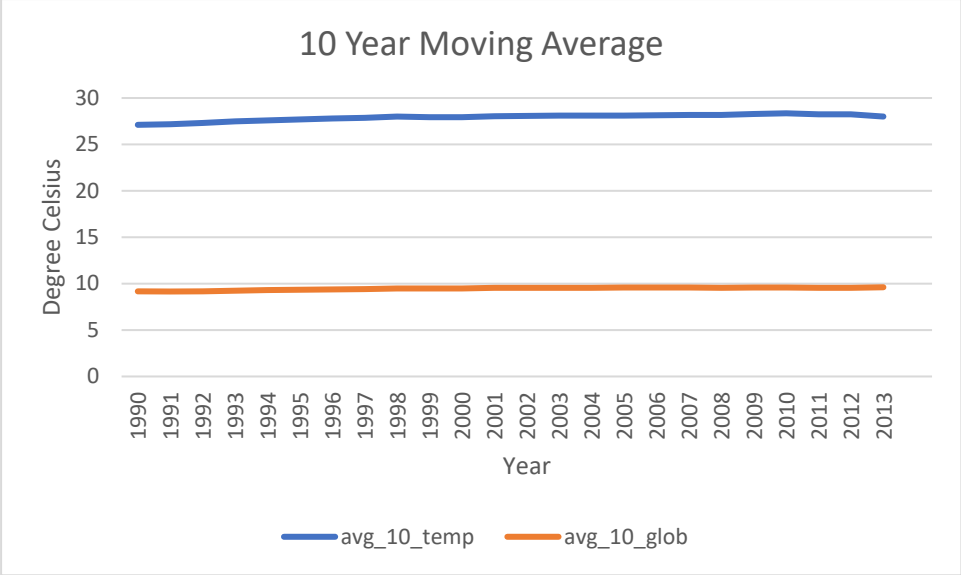

Figure 9 (10) Year Moving Average

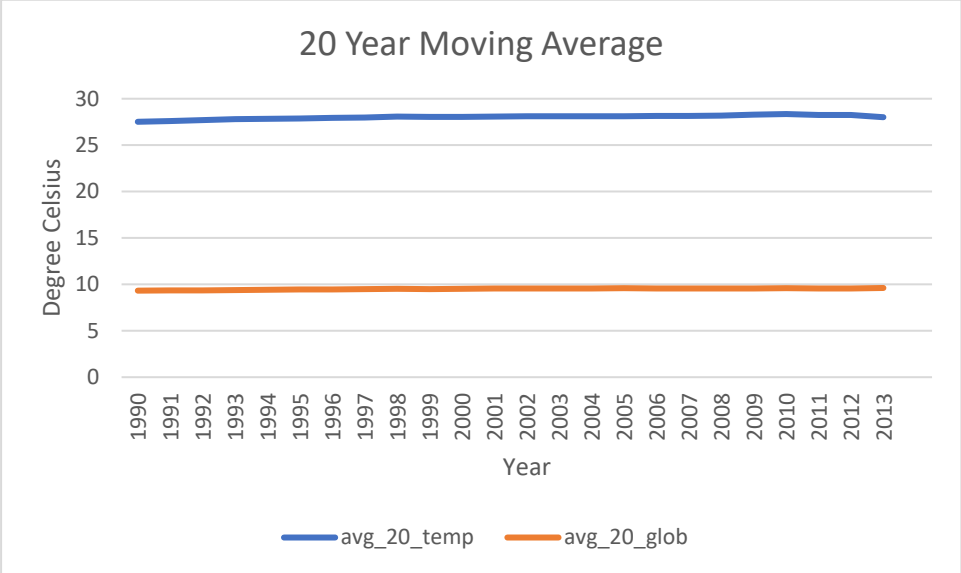

Figure 10 (20) Year Moving Average

- The temperature over the world has been raising in general. The relationship between Abu Dhabi and global can be measured by correlation. It is (0.967), which gives Very high correlation, very dependable relationship.
- Abu Dhabi is hotter than global temperature and temperature is increasing day by day due to changes in the climate.