Udacity Nanodegree Data Analyst

Explore Weather Trends

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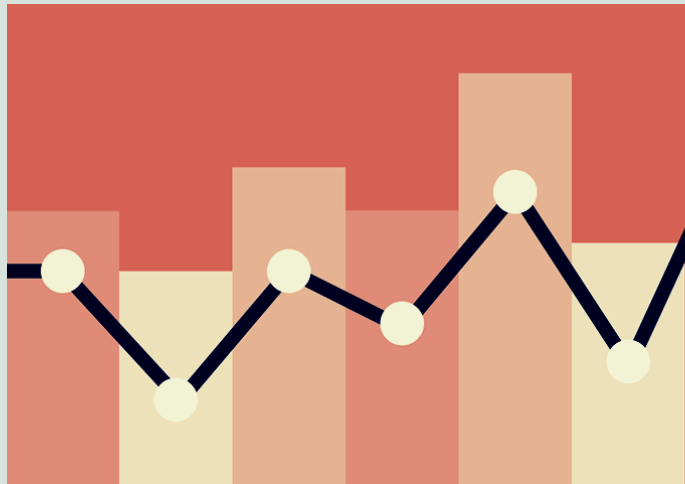


About Project

This project is submitted by Udacity to compare the average temperature of my country with the average global temperature and provide a visualization of the data and calculated the moving average

To do this, follow these steps:

QUERY 1

EXTRACT CITY_DATA

```
Select avg_temp, year, city
From city_data
where city='Beirut'
```

QUERY 2

EXTRACT GLOBAL_DATA

```
Select * from global_data
```

QUERY 3

JOIN TABLES

```
Select
B.year,
B.avg_temp As avg_beirut_temp,
G.avg_temp As avg_global_temp
From city_data AS B
Join global_data AS G
On B.year = G.year
Where B.city = 'Beirut' and B.year>=
1807;
```

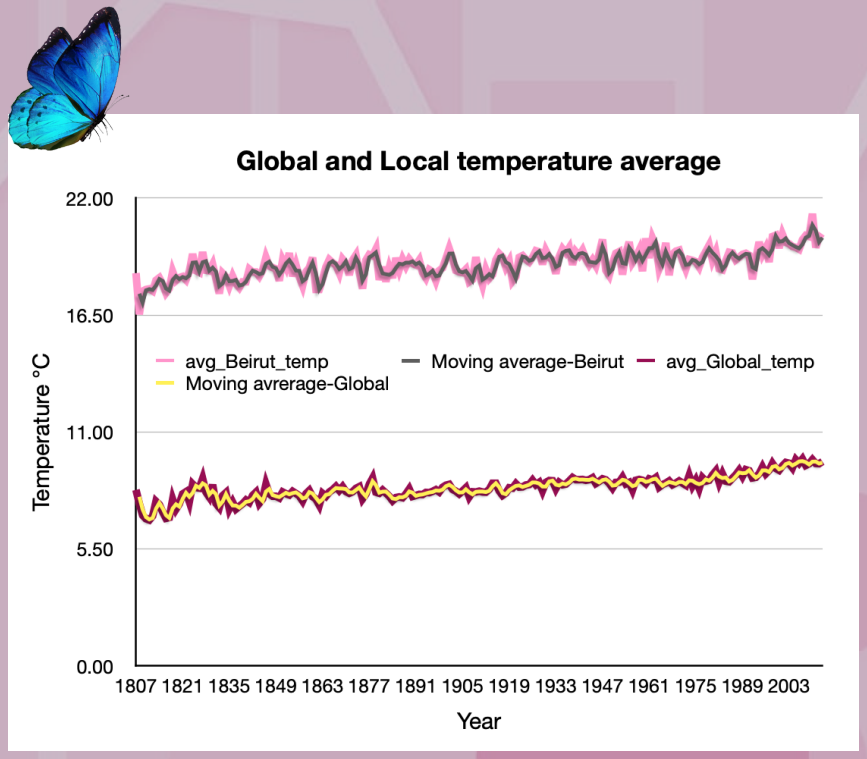
Queries result:

Join tables

year	avg_beirut_temp	avg_global_temp
1807	18.47	8.28
1808	16.53	7.63
1809	17.62	7.08
1810	17.70	6.92
1811	17.73	6.86
1812	17.63	7.05
1813	18.13	7.74
1814	18.25	7.59
1815	17.95	7.24
1816	17.54	6.94
1817	17.75	6.98
1818	18.54	7.83

In this table, two tables were joined:
1- city_data
2- global_data
After renaming the column "avg_temp"
and I chose the year "1807"
in order to avoid the empty cells using "Query 3"

step 2



DATA VISUALIZATION OF THE LINE CHART:

1- IN THIS GRAPH, THE FIRST THING WE NOTICE IS THE EXTREME DIFFERENCE IN TEMPERATURE BETWEEN THE CITY OF BEIRUT AND GLOBAL TEMPERATURES.

2- THE AVERAGE TEMPERATURE IN BEIRUT RANGES BETWEEN 16.50 °C AND 22.00 °C.

3- THE GLOBAL AVERAGE TEMPERATURE RANGES BETWEEN 5.50° C AND 11.00° C

step 3

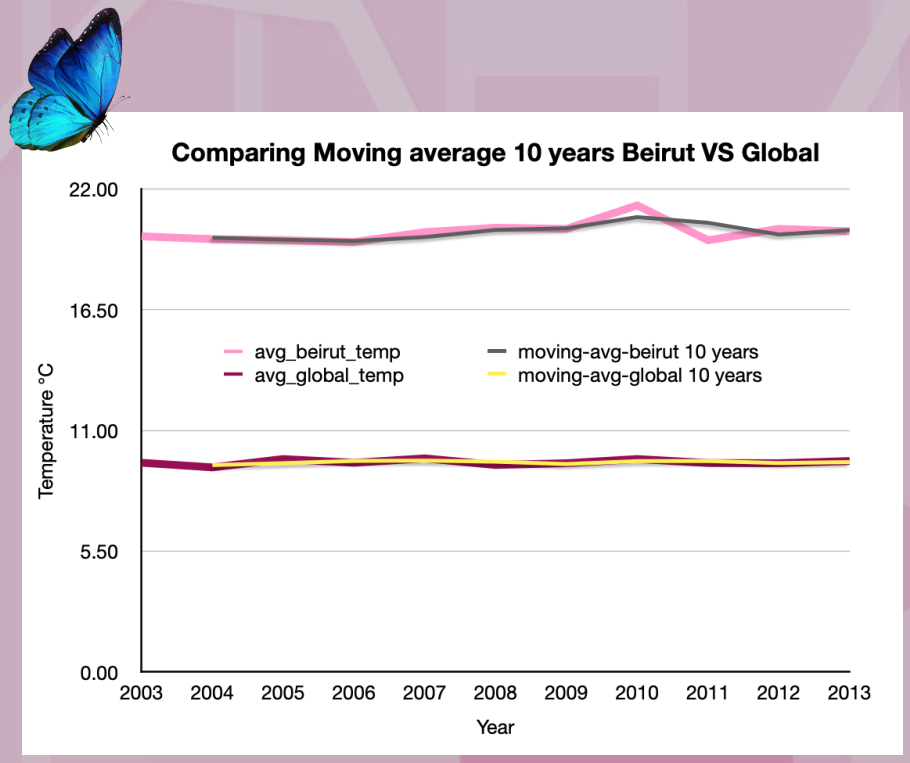
CALCULATE MOVING AVERAGE FOR 10 YEARS

Calculating Moving average

year	avg_beirut_temp	Moving-avg-Beirut	avg_global_temp	Moving-avg-Global
2003	19.85		9.53	
2004	19.72	19.79	9.32	9.43
2005	19.68	19.75	9.70	9.52
2006	19.59	19.71	9.53	9.52
2007	20.04	19.78	9.73	9.56
2008	20.24	19.85	9.43	9.54
2009	20.19	19.90	9.51	9.54
2010	21.26	20.07	9.70	9.56
2011	19.67	20.03	9.52	9.55
2012	20.19	20.04	9.51	9.55
2013	20.08	20.05	9.61	9.55

- AN AVERAGE REPRESENTS THE “MIDDLING” VALUE OF A SET OF NUMBERS. THE MOVING AVERAGE IS EXACTLY THE SAME, BUT THE AVERAGE IS CALCULATED SEVERAL TIMES FOR SEVERAL SUBSETS OF DATA, SO I CALCULATE THE MOVING AVERAGE FOR EVERY SET OF DATA IN THE LAST 10 YEARS USING THE AVRAGE METHOD PROVIDED BY NUMBERS APP IN MAC LIKE SHOWN IN THE BOTTOM OF THE IMAGE

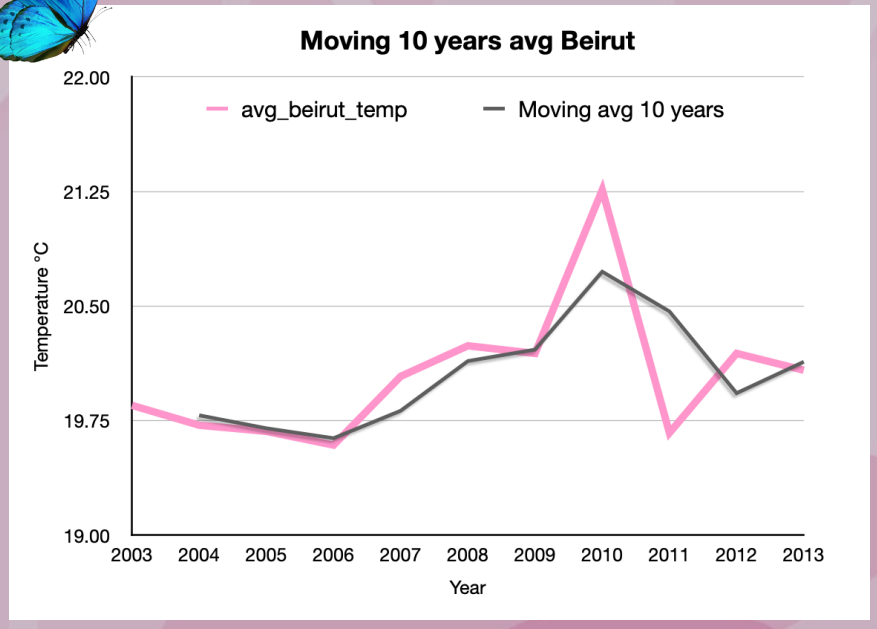
step 4



COMPARING MOVING AVERAGE FOR 10 YEARS BETWEEN BEIRUT AND GLOBAL TEMP:

- THROUGH THIS SCHEME, WE CANNOT OBTAIN AN IN-DEPTH VIEW THAT DIFFERS FROM WHAT WAS MENTIONED IN THE PREVIOUS SCHEME, SO WE WILL SEPARATE THE TWO SCHEMES FROM EACH OTHER SO THAT WE CAN GO DEEPER

COMPARING MOVING AVERAGE FOR 10 YEARS BETWEEN BEIRUT AND GLOBAL TEMP:

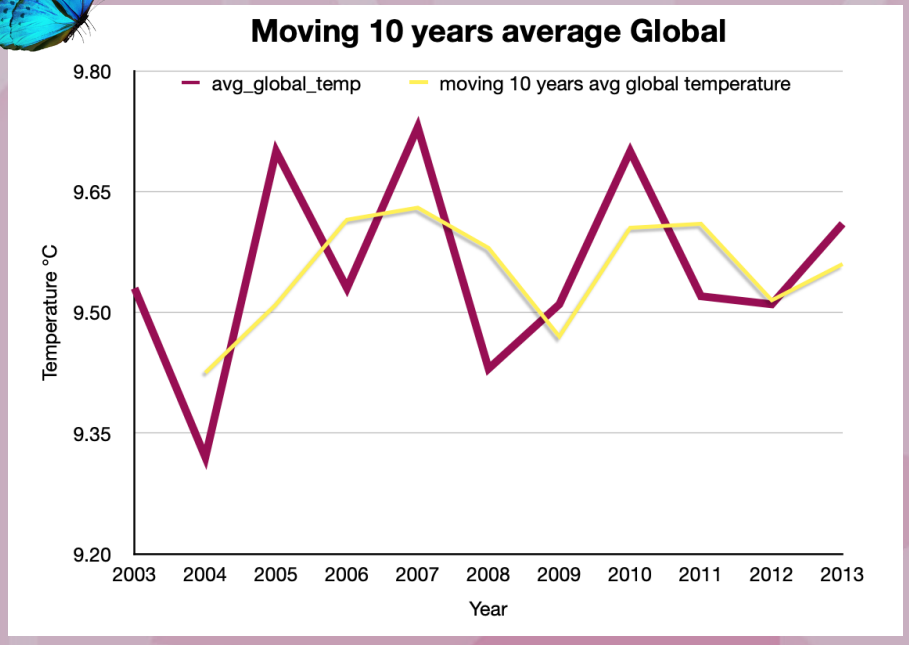


1- TEMPERATURES DECREASE FROM 2003 TO 2006

2- THE AVERAGE TEMPERATURE IN BEIRUT INCREASES GRADUALLY FROM 2006 TO 2009

3- THERE IS A SHARP ACENDING IN THE AVERAGE TEMPERATURE DURING THE WHOLE YEAR OF 2009, FOLLOWED BY A SEVERE DECREASE UNTIL 2011, AFTER WHICH IT GRADUALLY RETURNS TO THE ASCENT

COMPARING MOVING AVERAGE FOR 10 YEARS BETWEEN BEIRUT AND GLOBAL TEMP:



1- THE CHART SHOWS HOW SEVERE THE CHANGES IN GLOBAL TEMPERATURE ARE
2- THERE IS A SHARP DROP IN GLOBAL TEMPERATURE DURING THE YEAR 2003 TO 2004
3- A RAPID RISE IN GLOBAL TEMPERATURE AFTER THE YEAR 2004 TO 2005
4- A STATE OF INSTABILITY BETWEEN THE RISE AND FALL OF THE GLOBAL TEMPERATURE BETWEEN 2005 AND 2011

THE RESULT:

BY ANALYZING THE ATTACHED DATA, WE CONCLUDE THAT BEIRUT'S TEMPERATURE IS HIGH COMPARED TO THE GLOBAL AVERAGE TEMPERATURE
THERE ARE MANY CHANGES IN THE GLOBAL AND LOCAL CLIMATE AND A RISE IN TEMPERATURES OVER THE COURSE OF THE YEARS