EXPLORE WEATHER TRENDS

ANALYZE & COMPARE TEMP

ABSTRACT

This is the Data Analyst Nanodegree Program's first project. After extracting data from SQL, I must study and compare my local city's and global temperature trends for this project. I need to use a line chart to show the data and share at least four trending observations.

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OVERVIEW:

I need to make a graphic representation of the local and worldwide temperature trends for this project. Udacity provides a Temperature Database that used to extract global and local city temperature data. I started by extracting data from the database and saving it to a CSV file. After that, I calculated a 10-year moving average and constructed a line chart that compares local and global temperature trends. Finally, I wrote observations.

TOOLS:

- SQL: For extracting data from database.
- CSV: Download SQL data in CSV file.
- Excel: For Calculating Moving Average & Creating Line Charts

TECHNIQUES: SQL Commands, Moving Average, Line Charts

OUTLINE:

STEP1: EXTRACTING DATA WITH THE HELP OF SQL QUERIES.

For extracting temperature data for the global and local city, Udacity provide three tables: city list, city data, and global data.

I used LEFT JOIN Function to retrieve year, city avg_temp and global avg_temp from two different tables city_table & Global_data table.

```
SELECT c.year, c.avg_temp AS City_temp, g.avg_temp AS Global_temp
FROM city_data as c
LEFT JOIN global_data AS g ON c.year=g.year
WHERE c.country='United States' AND c.city='San Jose'
```

I am pulling records from the city data table (year,avg_temp) and matching records (avg_temp) from the global data dataset using the Left Join function. After that, I use where clause to just get data from my local city. I am doing this with the Where Clause, where the Country and City are "United States" and "San Jose," respectively.

After executing this command for my city "San Jose" and Country "United States" and I am getting 165 records.

STEP2: CALCULATING MOVING AVERAGE

I used Excel File for calculating moving average and creating Line Chart.

Excel file I have three rows one for year, second for Avg Temp of City and last one Avg Temp of Global Data with total no of 165 rows.

	A	B	C
1	year	city_temp	global_temp
2	1849	14.12	7.98
3	1850	13.8	7.9
4	1851	14.39	8.18
5	1852	13.81	8.1
6	1853	14.4	8.04
7	1854	13.98	8.21
8	1855	14.2	8.11

- **MOVING AVERAGE:** For creating a Moving Average value of city and global data I added two more columns in Excel sheet with name City_MA and Global_MA respectively.

  I am calculating 10 Years moving average. For avg_city column I applied formula on 11th Row of City_MA column.

  =AVERAGE(B2:B11)

  After that I copied this formula and pasted to all the rows below in City_MA column. For avg_global column I used same approach with =AVERAGE(C2:C11) formula.

  Now my Excel sheet have 10 years Moving Average for City and Global temp.

|	A	B	C	D	E
1	year	city_temp	global_temp	City_MA	Global_MA
2	1849	14.12	7.98		
3	1850	13.8	7.9		
4	1851	14.39	8.18		
5	1852	13.81	8.1		
6	1853	14.4	8.04		
7	1854	13.98	8.21		
8	1855	14.2	8.11		
9	1856	14.1	8		
10	1857	14.78	7.76		
11	1858	14.19	8.1	14.177	8.038
12	1859	13.71	8.25	14.136	8.065
13	1860	13.81	7.96	14.137	8.071
14	1861	14.88	7.85	14.186	8.038
15	1862	14.43	7.56	14.248	7.984
16	1863	14.43	8.11	14.251	7.991

- **KEY CONSIDERATION:** If we have to visually represent our trend data with the help of charts, we do with the help of Line Chart. So, for this project also I created three separate Line Charts for Global Temp Data, City Temp Data, and comparison between these two.
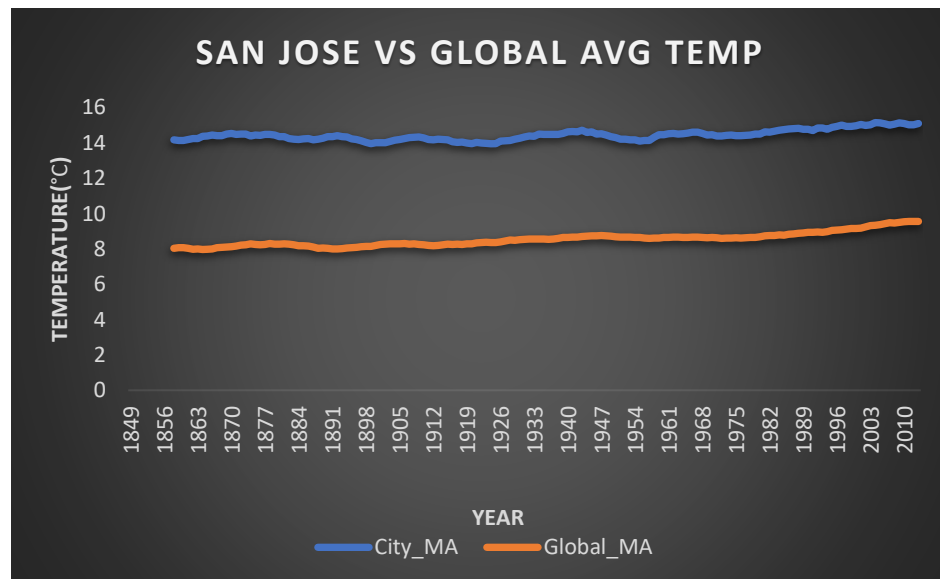
STEP3: CREATING LINE CHARTS

- **10-YEARS GLOBAL MOVING AVERAGE:** Create Line chart with the help of Year and City_MA columns.
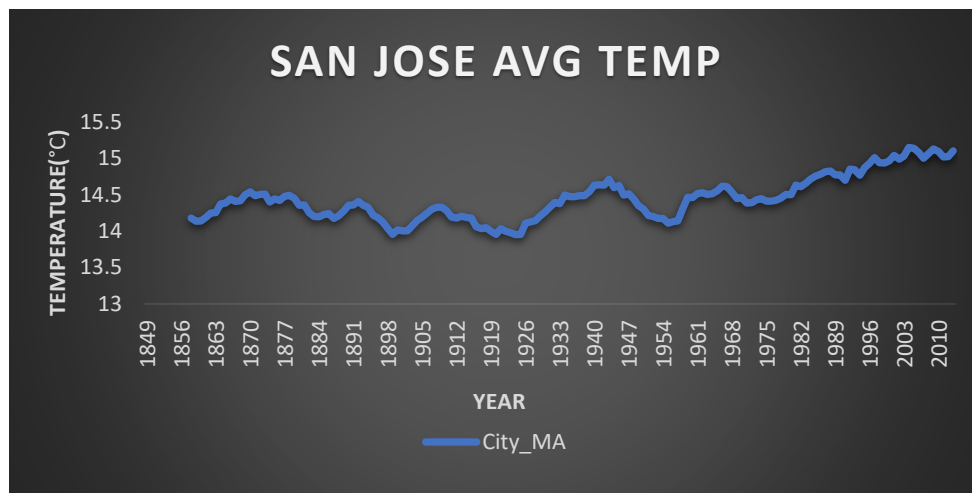
- **10-YEARS CITY MOVING AVERAGE:** Create Line chart with the help of Year and Global_MA columns.
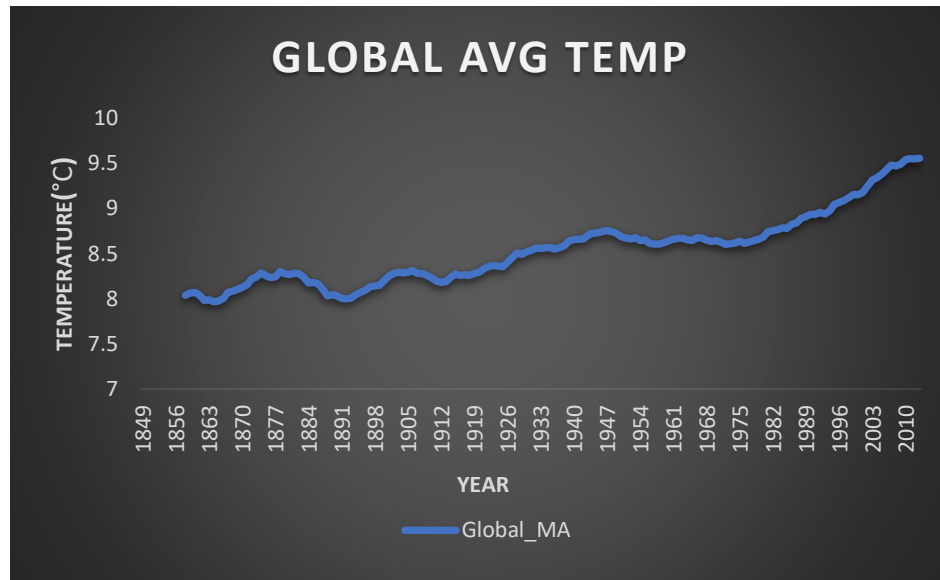
- **10-YEARS CITY & GLOBAL MOVING AVERAGE:** Create Line chart with the help of Year, City_MA & Global_MA columns.

OBSERVATIONS:

1. The temperature in my city decreased to 13.951°C in 1924, but afterwards increased until 1943. It dipped to 14.131°C again in 1955, but it has been steadily rising since 1975. My city's moving average temperature ranges from 13.951°C to 15.148°C.
2. The global temperature is steadily rising. There is no drop like my city. The temperature ranges between 7.968°C and 9.556°C for the Global Moving Average.

3. There are no similarities between the statistics from Global and my city.
4. The average temperature difference between the global and my local city is roughly 5.6°C.
5. After 1935, the temperature in my city was always over 14°C.
6. My city is getting hotter, and the temperature in my city, as well as globally, is rising day by day.
7. I tried to make a Moving Average for periods longer than ten years (20, 25, and 50), but the graphic remained the same for all periods.

REFRENCES:

- https://knowledge.udacity.com/?nanodegree=nd002&page=1&project=330&rubric=1125
- https://stackoverflow.com/questions/387453/how-do-you-display-code-snippets-in-ms-word-preserving-format-and-syntax-highlig
- https://www.youtube.com/watch?v=iG6lN9aBrcM