WEATHER TRENDS

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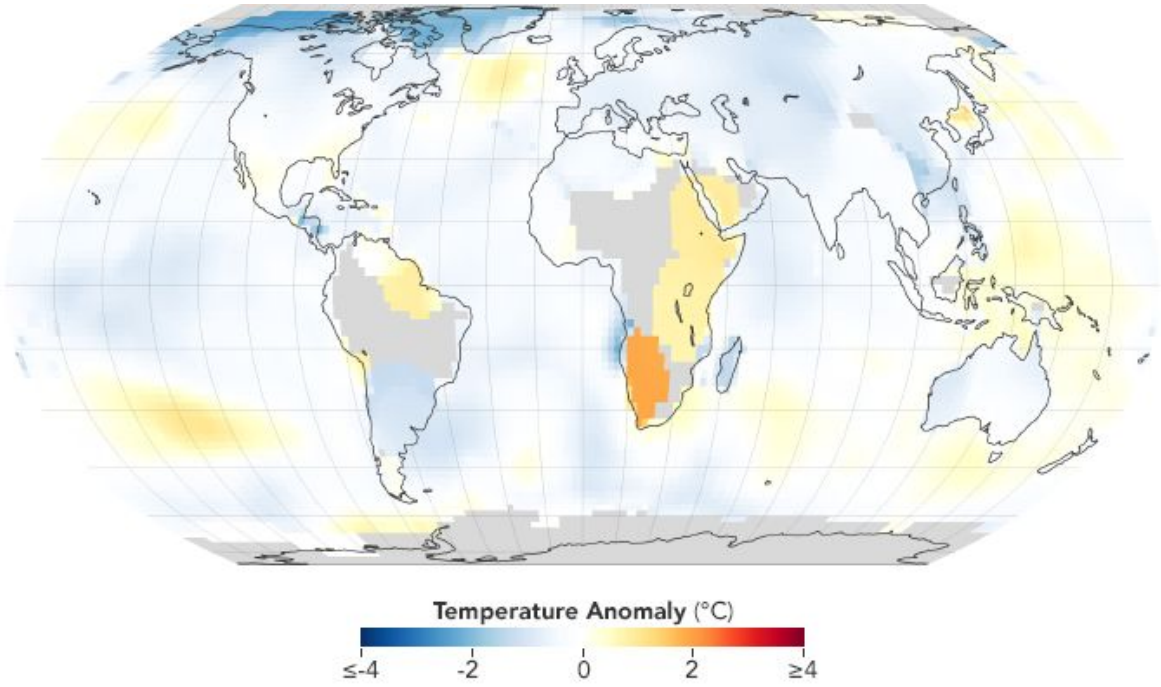
ABHIGNYA CHATARMAL



Overview

In this project, the local and global temperature has been analysed and temperature trends in Hyderabad, India and other four cities across the world (i.e, London, Boston, Sydney, Seoul)has been compared to global temperature trends.

To extract the data from the database SQL queries has been used.

Excel has been used to calculate the moving average and line charts have been added.

TOOLS USED

- **SQL**

To extract the data from the database the SQL queries have been used.

❖ **SQL QUERIES-**

1. To find the cities list from India

```
Select * from city_list where country = 'India';
```

2. I selected the city 'HYDERABAD' and then downloaded the result to CSV

```
Select * from city_data where city=
'hyderabad' AND country = 'India';
```

3. To get the global average temperature and then downloaded the results to CSV

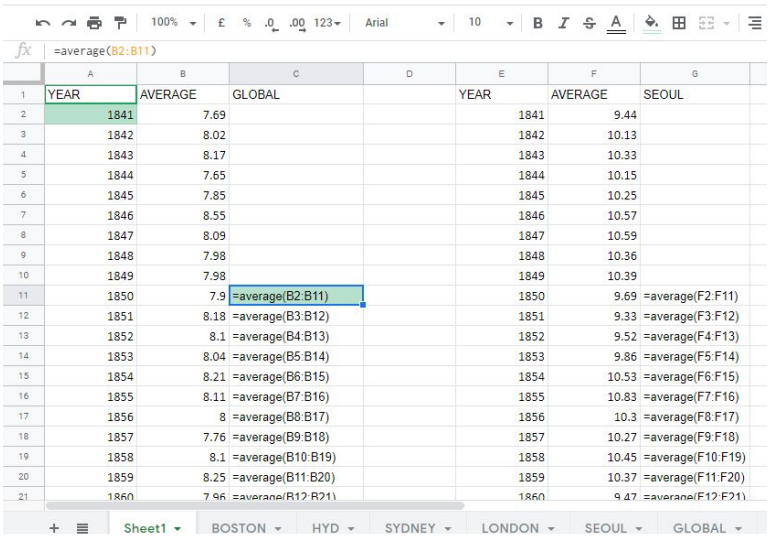
```
Select * from global_data;
```

4. For each city the SQL query has been executed separately and downloaded the results to CSV

```
select * from city_list where country='South Korea';

select * from city_data where city='Seoul' AND
country='South Korea';

select * from city_list where country='Australia';

select * from city_data where city='Sydney';

select * from city_list where country='United States';

select * from city_data where city='Boston' AND
country = 'United States';

Select * from city_data where city='London';
```

- # EXCEL

❖ MOVING AVERAGE



=average(B2:B11)

	A	B	C	D	E	F	G
1	YEAR	AVERAGE	GLOBAL		YEAR	AVERAGE	SEOUL
2	1841	7.69			1841	9.44	
3	1842	8.02			1842	10.13	
4	1843	8.17			1843	10.33	
5	1844	7.65			1844	10.15	
6	1845	7.85			1845	10.25	
7	1846	8.55			1846	10.57	
8	1847	8.09			1847	10.59	
9	1848	7.98			1848	10.36	
10	1849	7.98			1849	10.39	
11	1850	7.9	=average(B2:B11)		1850	9.69	=average(F2:F11)
12	1851	8.18	=average(B3:B12)		1851	9.33	=average(F3:F12)
13	1852	8.1	=average(B4:B13)		1852	9.52	=average(F4:F13)
14	1853	8.04	=average(B5:B14)		1853	9.86	=average(F5:F14)
15	1854	8.21	=average(B6:B15)		1854	10.53	=average(F6:F15)
16	1855	8.11	=average(B7:B16)		1855	10.83	=average(F7:F16)
17	1856	8	=average(B8:B17)		1856	10.3	=average(F8:F17)
18	1857	7.76	=average(B9:B18)		1857	10.27	=average(F9:F18)
19	1858	8.1	=average(B10:B19)		1858	10.45	=average(F10:F19)
20	1859	8.25	=average(B11:B20)		1859	10.37	=average(F11:F20)
21	1860	7.96	=average(B12:B21)		1860	9.47	=average(F12:F21)

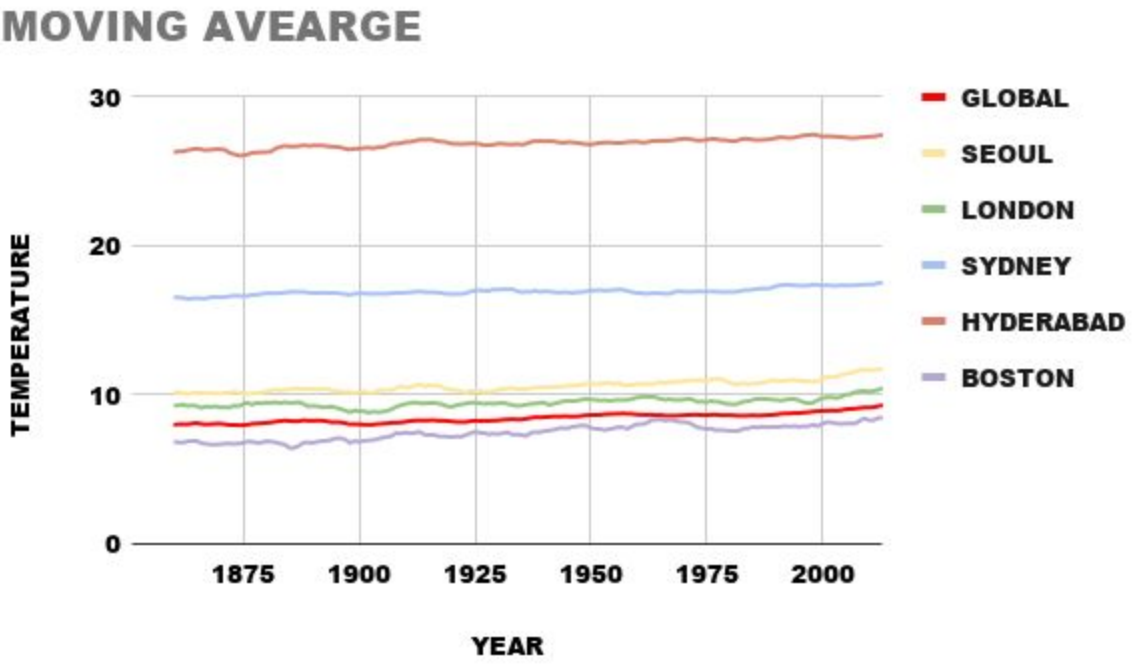
Sheet1 | BOSTON | HYD | SYDNEY | LONDON | SEOUL | GLOBAL

Since, the timeline of different cities were different to make it the same timeline for all the cities, the observation starts from the year 1841. After downloading the results to CSV, the CSV is opened in Excel to calculate the moving average of 10 years.

❖ LINE CHART

After calculating the moving average of all the cities (Hyderabad, London, Seoul, Sydney, Boston) and the global average. The line chart is created to compare the cities with the global moving average temperature.

OBSERVATION



- In the above graph, the global average temperature lies in the range between 7 degrees to 9 degrees. The global average temperature indicates the average temperature of the entire surface planet. The moving average is calculated for 10 years. The moving average of the first 10 years (1841-1850) is 7.988 degrees and the moving average of the last ten years (2004-2013) is 9.556 degrees. The graph shows a slight increase in the temperature in the last decade.
- **Boston average temperature** lies slightly below the global average temperature. It is cooler than global average temperature. The moving average of the first 10 years is 6.849 and the last moving average of 10 years is 9.023 which is lower than the global average

temperature. The difference between global average temperature and boston average temperature has been consistent the last few decades but in the year between 1950-1975 the temperature of boston was near to global average temperature. The correlation between boston average temperature and global average temperature is 0.7346634847, this shows that it has a strong positive relationship. As the global average temperature increases, the temperature of boston also increases.

- **London's average temperature** is slightly hotter than global average temperature. The mean average of London temperature is 9.573410405 which is close to global average temperature (8.528901734). The correlation between London average temperature and global average temperature is 0.583771736 which is considered moderately correlated. As we can see in the graph as the global average temperature increases the London average temperature also increases.
- **Seoul average temperature** lies in a range between 10 degrees and 12 degrees which indicates that it is slightly hotter than global average temperature. The correlation between the Seoul average temperature and the global average temperature is 0.7046157687 which indicates the strong positive linear relationship. As the temperature increases the global temperature also increases.
- **Sydney average temperature** lies in the range between 16 degrees and 18 degrees and the mean average temperature is 17.00421965 which is hotter than global average temperature. The difference between the global average temperature and Sydney temperature has been consistent over the past few hundred years. The correlation

between the sydney average temperature and global average temperature is 0.7543434932 which indicates the strong positive linear relationship.

- **Hyderabad's average temperature** shows that it is the hottest city. The global and hyderabad average temperature shows huge differences. The mean of hyderabad temperature is 26.94086705 which clearly indicates that it is hotter than global average temperature. The difference between global and hyderabad average temperature has been consistent over the last hundred years. The correlation between the global and hyderabad average temperature is 0.7451613332 which shows the strong positive linear relationship.

CONCLUSION

- Hyderabad is very hot compared to global average temperature and Boston is slightly colder than global average temperature.
- There is a positive linear relationship between the local and global average temperatures. As the temperature increases, the global average temperature also increases.
- As time passes, the temperature of cities is increasing.
- The overall trend shows that the world is getting hotter as the the time passes.

ATTRIBUTES

https://www.udemy.com/course/the-data-science-course-complete-data-science-bootcamp/learn/lecture/10764432#overview