**EXPLORE WEATHER TRENDS**

* SQL Queries to extract the data from the database are:

1. **To extract whole data from city\_data:** SELECT \*

FROM city\_data;

1. **To extract whole data from city\_list:** SELECT \*

FROM city\_list;

1. **To extract whole data from global\_data:** SELECT \*

FROM global\_data;

1. **To extract data related to near by city i.e. Delhi:** SELECT \*

FROM city\_data

WHERE city='Delhi';

* Comparison of Delhi Temperature and Global Temperature:

Both the temperatures were taken in 25 year moving average form. In both cases averages of 25 years are taken from 1750 to 2015 in global temperature and 1772 to 2013 in case of Delhi.

**Observations:**

1. Delhi is hotter compared to the global temperature. It is about 20 0C than the average global temperature.
2. Whole world is becoming hotter by years due to global warming. Average global temperature is changed to 8.75 0C in 1774 to 9.27 0C in 2013. For Delhi its, 24.58 0C in 1820 to 26.07 0C in 2013.
3. In the graph it can be seen that variation around the mean of average temperature during the years in 18th century was more while in 21st century the graph is steadier and is growing upwards. That means the weather is more variant during the 18th century.
4. Delhi graph is more variant than global. Hence it can be seen that if we consider only a small area, seasons affects more to that as compared to whole planet.

**Correlation Coefficient:** Correlation coefficient is a statistical measure used to predict the change in one variable with the changes made in another variable. In positive coefficient, both the variables increases or decreases in tandem. In negative coefficient, if one increases other decreases and vice-versa. Its value is between +1 and -1. More it is near the zero, less is the correlation. It is maximum at both the ones.

**Correlation coefficient (R) = n∑dg - (∑d)(∑g)**

**√{n∑d2 – (∑d)2 } √{n∑g2 – (∑g)2 }**

Where d= 25 year moving average of Delhi temperature.

g= 25 year moving average of global temperature.

n= number of years whose data is considered

Here , R= 0.8082

i.e. There is strong correlation between the global and Delhi temperature values and Delhi temperature can be predicted if we know the global data.

Using the linear relation: d = a + bg;

Where, **b= n (∑dg) - ∑d ∑g**  = 0.863

**n ∑g2  - (∑g)2**

a= d̅ - b g̅ = 17.869

putting the values of a and b in linear relation equation, we get **d= 17.869+0.863g**.

Now this relation can be used to estimate the value of Delhi temperature if we know the global temperature.

For Example, if g=8.5, then d= 17.869+0.863\* 8.5 = 25.20 0C.