

EXPLORE WEATHER TRENDS

1. TOOLS

- a. SQL - For data extraction
- b. Python
 - i. Pandas - For moving average calculation
 - ii. Matplotlib - For data visualization
- c. Jupyter Notebook

2. STEPS

- a. SQL query for data fetching. Inner Join on the tables and city_avg and global_avg for same years are extracted to CSV.

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

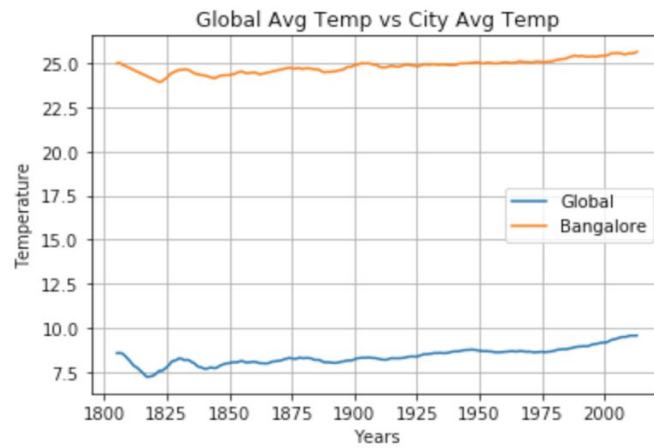
```
select city_data.avg_temp as city_avg,  
global_data.avg_temp as global_avg, global_data.year  
from global_data join city_data on  
global_data.year= city_data.year where city =  
'Bangalore';
```

- b. Using *rolling()* and *mean()* functions in **Pandas**, rolling avg for global avg temp and local avg temp is calculated. Window used for calculation is 10 yrs. Since the initial values in the window will **NaN**, those are dropped using *dropna()* function as filling with any other values affects the mean temperature.

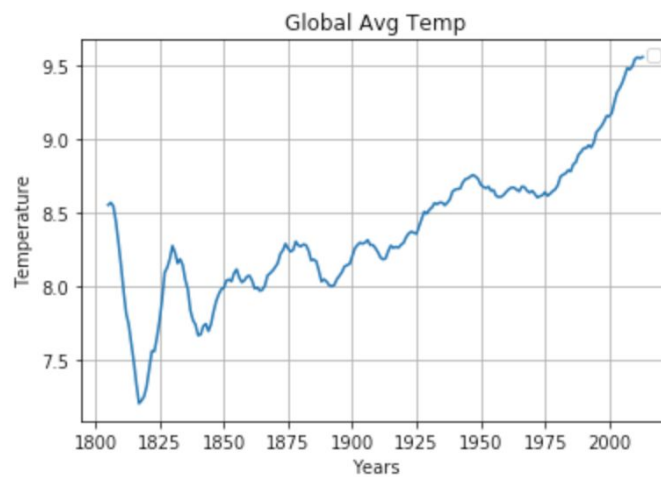
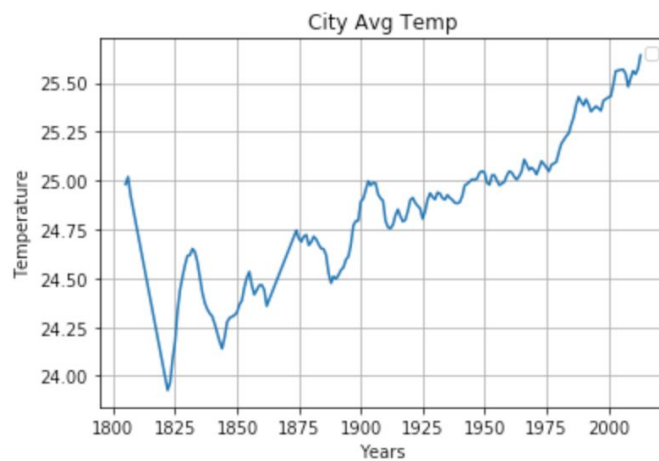
```
global_mov_avg = df['global_avg'].rolling(10).mean().dropna()  
global_mov_avg
```

```
city_mov_avg = df['city_avg'].rolling(10).mean().dropna()  
city_mov_avg
```

- c. Plotted the **Line chart** between avg temperature vs years for both global avg temperature and city avg temperature



- d. Separately plotting City avg temp and Global Avg temp



3. OBSERVATIONS

- Global avg temperature shows an upward trend over the last 2 centuries.
- Global avg temperature has gone upwards consistently after 1975
- Bangalore city avg temperature has risen by 0.5 degree Celsius during 1950 - 2000
- There is constant increase in global avg temperature, which can be concluded to global warming.
- Bangalore city avg temperature is much greater than the global avg temperature making it hotter place.
- Bangalore city avg temperature is roughly around 2.5 times of global avg temperature after 1900's

4. REFERENCES

- a. <https://pandas.pydata.org/pandas-docs/stable/index.html>
- b. <https://matplotlib.org/3.1.1/gallery/index.html>