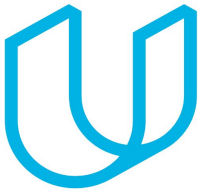


UDACITY

Data Analyst Nanodegree

Project : Explore Weather Trends

Sai Kiran Sangam

Overview

In this project, I have analyzed local temperature and global temperature data and compared the temperature trends for the Virginia Beach, United States.

Extracting data from a database using SQL

```
/* Select Local Temperature */
SELECT * FROM city_list WHERE country = 'United States';
```

To visualize city_data

```
SELECT * FROM city_data WHERE city = 'Virginia Beach' AND country = 'United States';
```

To visualize global_data

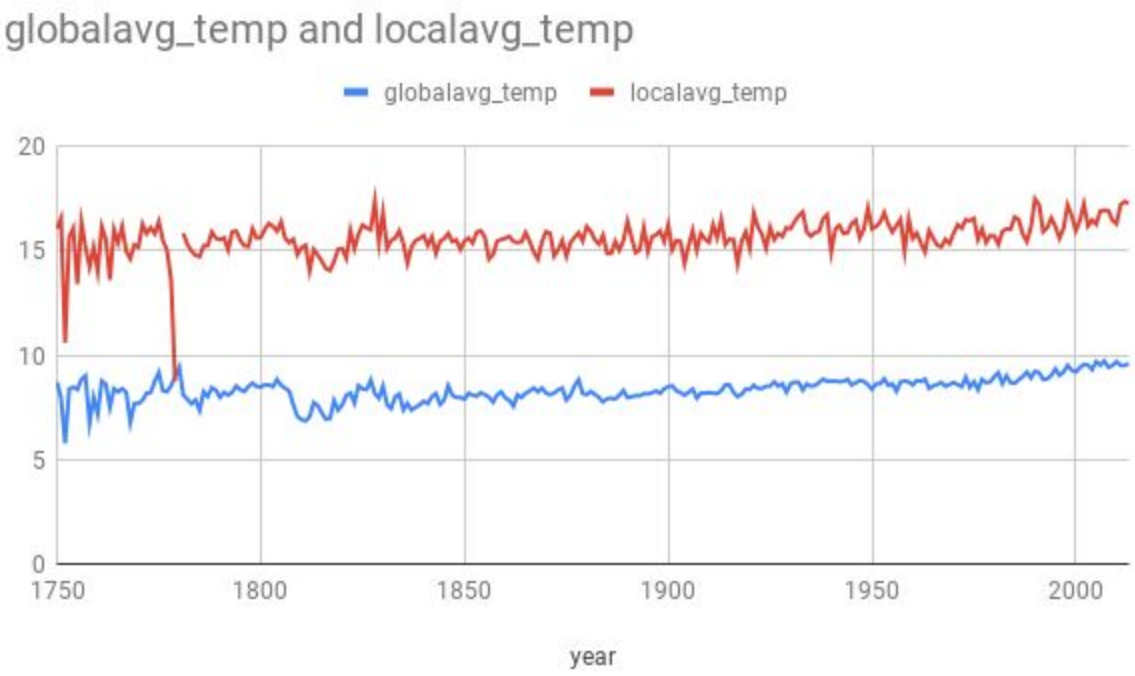
```
/* Select Global Temperature */
SELECT * FROM global_data;

/* changing the names of columns in order to have distinct columns */

ALTER TABLE city_data RENAME COLUMN avg_temp to localavg_temp;
ALTER TABLE global_data RENAME COLUMN avg_temp to globalavg_temp;

/* Join tables */
SELECT global_data.year, city_data.city, global_data.globalavg_temp,
city_data.localavg_temp from global_data, city_data
WHERE (global_data.year = city_data.year) AND (city_data.city = ‘Virginia Beach’ AND city_data.country = ‘United States’);
```

Downloaded csv file

Data Visualization

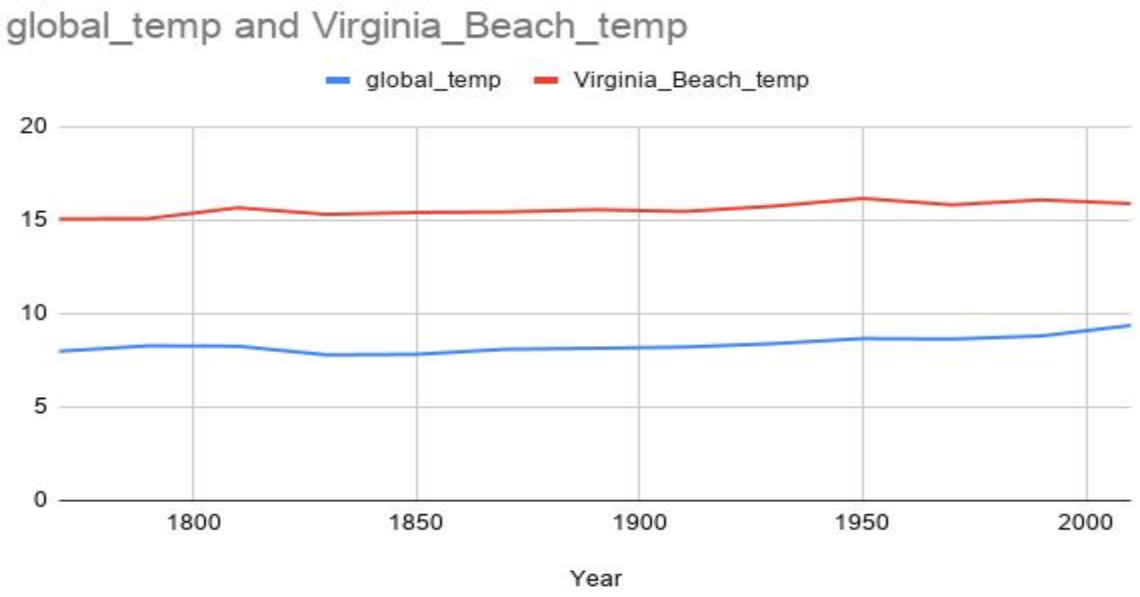
spreadsheets

- Line chart plotted using microsoft excel for Virginia Beach temperature versus Global temperature.



-
- Moving Averages for 20 years are calculated for globalavg_temp and localavg_temp to smooth out data and make it easier to observe long term trends after plotting the line chart.
- =AVERAGE(range of 20 years)

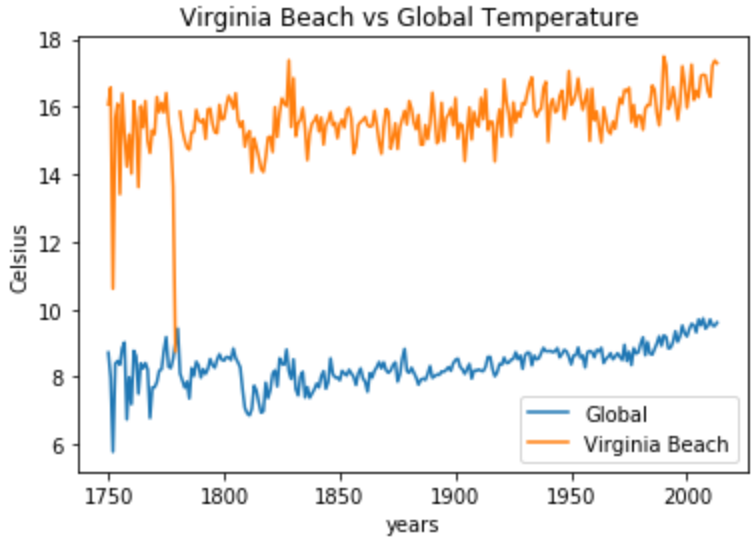
- Line chart plotted for moving averages



Jupyter Notebook(Python)

```
import pandas as pd
import matplotlib.pyplot as plt
import numpy as np


result = pd.read_csv('result.csv')


result.info()   # 1 missing value for loacalavg_temp
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 264 entries, 0 to 263
Data columns (total 4 columns):
year              264 non-null int64
city              264 non-null object
globalavg_temp    264 non-null float64
localavg_temp     263 non-null float64
dtypes: float64(2), int64(1), object(1)
memory usage: 8.3+ KB
```

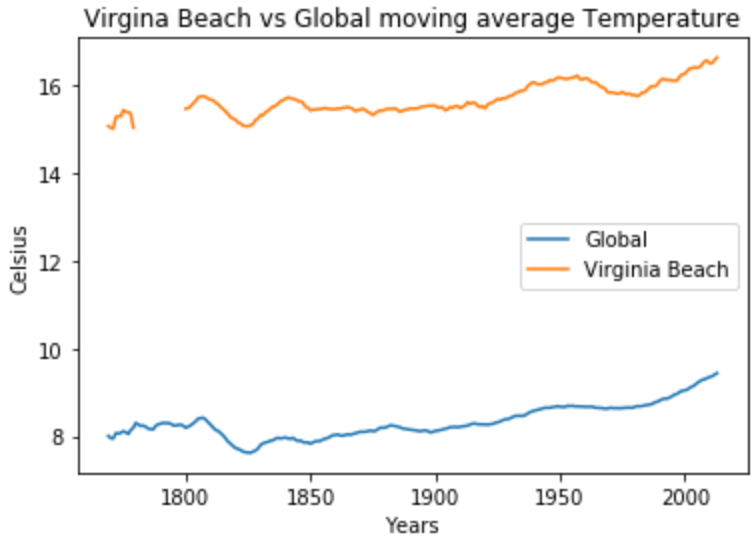
```
globalavg_temp = result['globalavg_temp']
localavg_temp = result['localavg_temp']

plt.plot(result['year'],globalavg_temp, label = 'Global')
plt.plot(result['year'], localavg_temp, label = 'Virginia Beach')
plt.legend()
plt.xlabel("years")
plt.ylabel("Celsius")
plt.title("Virginia Beach vs Global Temperature ")
```



- Moving Averages for 10 years

```
global_mavgtemp = result['globalavg_temp'].rolling(20).mean()
local_mavgtemp = result['localavg_temp'].rolling(20).mean()

plt.plot(result['year'], global_mavgtemp, label = 'Global')
plt.plot(result['year'], local_mavgtemp, label = 'Virginia Beach')
plt.legend()
plt.xlabel("Years")
```

plt.ylabel("Celsius")
plt.title(" Virgina Beach vs Global moving average Temperature")



Observations

- The trend line shows global average temperature is increasing over the years
- The Virginia Beach minimum temperature was 8.76 °C and maximum temperature was 17.49 °C.
- The Global minimum temperature was 5.78 °C and maximum temperature was 9.73 °C.
- Global average temperature is 8.36 °C and Virginia Beach average temperature is 15.65 °C
- Comparing the Global average temperature and Virginia Beach average temperature then we can see Virginia Beach is hotter than Global average temperature.
- The Line Chart shows that the temperature of the world is on a constant rise.

Conclusion

In conclusion, we can outline that the global temperature has been increasing exponentially and Virginia Beach temperatures are also increasing at a similar rate.