

Exploring Weather Trends

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Summary

This project will be analysed the temperature of **local (Mecca)** and global. Then, it will compare the temperature between **local (Mecca)** and global.

Extract the data

In this part, I'll use SQL to extract data of temperatures of **Mecca** and global

Query

- `SELECT * FROM global_data;`

```
In [1]: from IPython import display
from base64 import b64decode
base64Img = "iVBORw0KGgoAAAANSUgAABE4AAQFCAYAAACvo40jAAAAAXNSR0IArs4c6QAAARnQU1BAACxjwv8YQUAAAAJcEhZcwAAFi"
display, Image(b64decode(base64Img))
```

Out[1]:

Input

HISTORY

MENU

SCHEMA

city_data

city_list

global_data

1

2

SELECT * FROM global_data;

Success!

EVALUATE

year	avg_temp
1750	8.72
1751	7.98
1752	5.78
1753	8.39
1754	8.47
1755	8.36
1756	8.85
1757	9.02

- `SELECT year, city, avg_temp FROM FROM city_data WHERE city = 'Mecca';`

```
In [2]: base64Img = "iVBORw0KGgoAAAANSUgAABEUgAABEUAAAP6CAYAAAB2IOOWAAAAAXNSR0IArs4c6QAAARnQU1BAACxjwv8YQUAAAAJcEhZcwAAFi"
display, Image(b64decode(base64Img))
```

Out[2]:

Input

HISTORY

MENU

SCHEMA

city_data

year

city

country

avg_temp

1

2

SELECT year, city, avg_temp FROM city_data WHERE city = 'Mecca';

Success!

EVALUATE

year	city	avg_temp
1843	Mecca	25.16
1844	Mecca	19.05
1845	Mecca	22.46
1846	Mecca	
1847	Mecca	
1848	Mecca	

Exploring CSV files

```
In [3]: #import pandas library
import pandas as pd
```

```
In [4]: #read csv files
localTemp = pd.read_csv('Mecca_temp.csv', encoding='utf-8')
globalTemp = pd.read_csv('global_temp.csv', encoding='utf-8')
```

Explore dataset of local and global temperatures

```
In [5]: localTemp.head()
```

	year	city	avg_temp
0	1843	Mecca	25.16
1	1844	Mecca	19.05
2	1845	Mecca	22.46
3	1846	Mecca	NaN
4	1847	Mecca	NaN

```
In [6]: globalTemp.head()
```

	year	avg_temp
0	1750	8.72
1	1751	7.98
2	1752	5.78
3	1753	8.39
4	1754	8.47

```
In [7]: localTemp.isnull().sum()
```

year	0
city	0
avg_temp	15
dtype:	int64

```
In [8]: globalTemp.isnull().sum()
```

year	0
avg_temp	0
dtype:	int64

```
In [9]: localTemp[localTemp.isna().any(axis=1)]
```

	year	city	avg_temp
3	1846	Mecca	NaN
4	1847	Mecca	NaN
5	1848	Mecca	NaN
6	1849	Mecca	NaN
7	1850	Mecca	NaN
8	1851	Mecca	NaN
9	1852	Mecca	NaN
10	1853	Mecca	NaN
11	1854	Mecca	NaN
12	1855	Mecca	NaN
13	1856	Mecca	NaN
14	1857	Mecca	NaN
15	1858	Mecca	NaN
16	1859	Mecca	NaN
17	1860	Mecca	NaN

As it can be seen table, the null value from 3 to 17. So for local data, I'll drop records from 1 to 17. Then I'll deal with data from year 1861 until 2013. Also, global data will be used from 1861 to 2013.

Cleaning local data

As can be seen previously, the dataset of local temperatures has 15 records missing. So, I'll drop those records from data to calculate moving average.

```
In [10]: localTemp = localTemp[18:]
```

```
In [11]: localTemp.head()
```

	year	city	avg_temp
18	1861	Mecca	23.98
19	1862	Mecca	24.13
20	1863	Mecca	22.87
21	1864	Mecca	25.43
22	1865	Mecca	25.60

```
In [12]: globalTemp = globalTemp[111:]
```

```
In [13]: globalTemp.head()
```

	year	avg_temp
111	1861	7.85
112	1862	7.56
113	1863	8.11
114	1864	7.98
115	1865	8.18

```
In [14]: localTmpeMovAvg = localTemp['avg_temp'].rolling(10).mean()
globalTmpeMovAvg = globalTemp['avg_temp'].rolling(10).mean()
```

```
In [15]: localTmpeMovAvg.describe()
```

count	144.000000
mean	25.669924
std	0.363178
min	24.935000
25%	25.393750
50%	25.663000
75%	25.812250
max	26.800000
Name:	avg_temp, dtype: float64

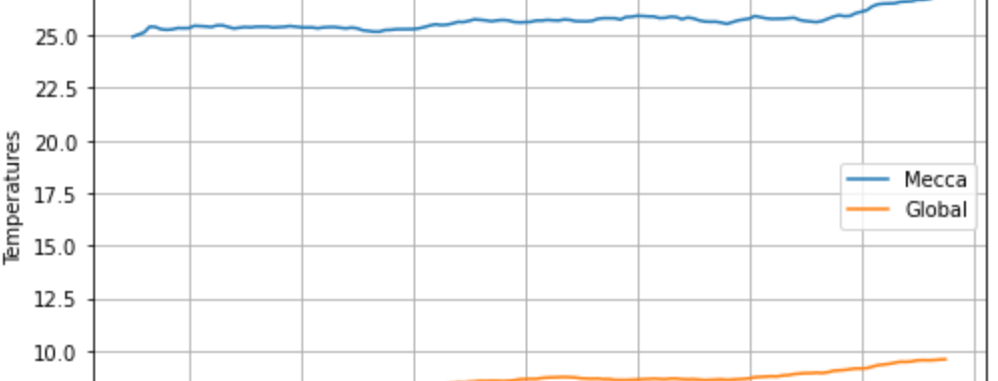
```
In [16]: globalTmpeMovAvg.describe()
```

count	146.000000
mean	8.595979
std	0.396115
min	8.000000
25%	8.275500
50%	8.611500
75%	8.743750
max	9.594000
Name:	avg_temp, dtype: float64

Line chart

```
In [17]: #import tool of visualization
import matplotlib.pyplot as plt
```

```
In [18]: #Local and global line chart
plt.figure(figsize=(8, 4))
plt.plot(localTemp['year'], localTmpeMovAvg, label='Mecca')
plt.plot(globalTemp['year'], globalTmpeMovAvg, label='Global')
plt.legend()
plt.xlabel("Years")
plt.ylabel("Temperatures")
plt.title("Mecca and Global Average Temperatures")
plt.grid(True)
plt.show()
```



observations

- It can be seen descriptive of Mecca temprture, the highest average of temperature is 26.800 and the lowest is 24.935. However, the highest average temperature of global is 9.594 and the lowest temperature is 8.595.
- As it can be seen in the line chart, Mecca is hotter than global. Also, the line chart shows Mecca is always hotter over time.
- The temperatures of Mecca is ups and downs until 1995 then Temperatures are incresed to highest. However, the global temperatures ups and downs until 1980 then it rise to highest.

- From line chart, both Mecca and global are getting hotter over last hundreds years.