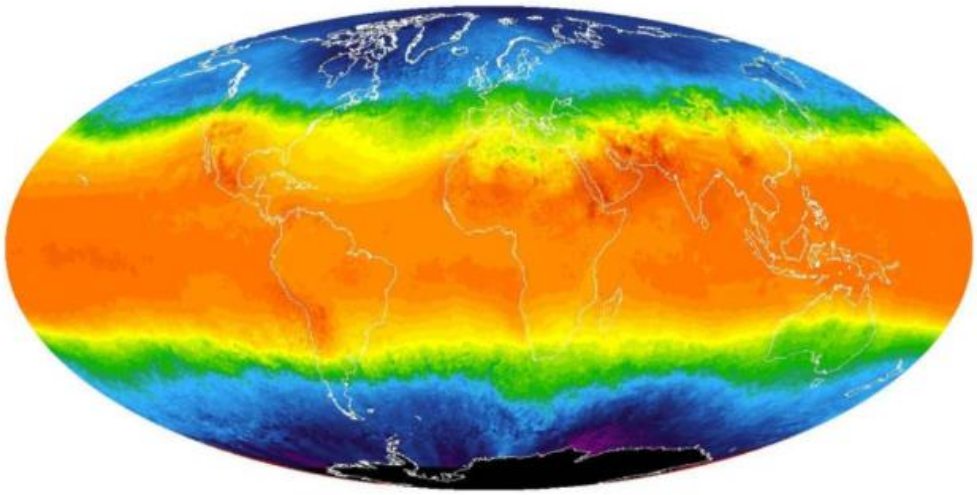
UDACITY DATA ANALYST NANODEGREE



Project Name: Explore Weather Trends

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Progress outline:

1. What tools did you use for each step? (Python,SQL,Excel,etc)

a. I used two SQL queries to extract required data from data base, queries are as follows:

i. Global Data:

```
SELECT  * FROM global_data ;
```

ii. Local Data : (Austin, USA)

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

The closet city is Austin so I took that data from database

b. The data has been analysed using Python Programming Language using IPYTHON Notebook (Jupyter)

c. The downloaded file is imported as shown:

Import necessary libraries for the project

```
import pandas as pd   # for dealing with data
import matplotlib.pyplot as plt # for visualizing data
import numpy as np # for calculating the moving average
```

Import the Data!!

```
global_temp = pd.read_csv('global_data.csv.csv')   # importing global temperature data'

city_temp = pd.read_csv('city_data.csv.csv')    #importing particular city(austin) temperature over multiple years
```

2. How did you calculate the moving average?

- Rolling average has been calculated to smooth out data and to make it easier to observe the trends when it be shown in charts.
- The rolling average has been calculated for every 10 years to each single data but the first 10
- Python was used for calculating the Moving Average using built-in functions such as rolling,mean.
- Python code for what has been explained

Perform 'Moving average' for the Global data and Local data

Moving average are used to smooth out data and to make it easier to observe long term trends and not get lost in daily variations

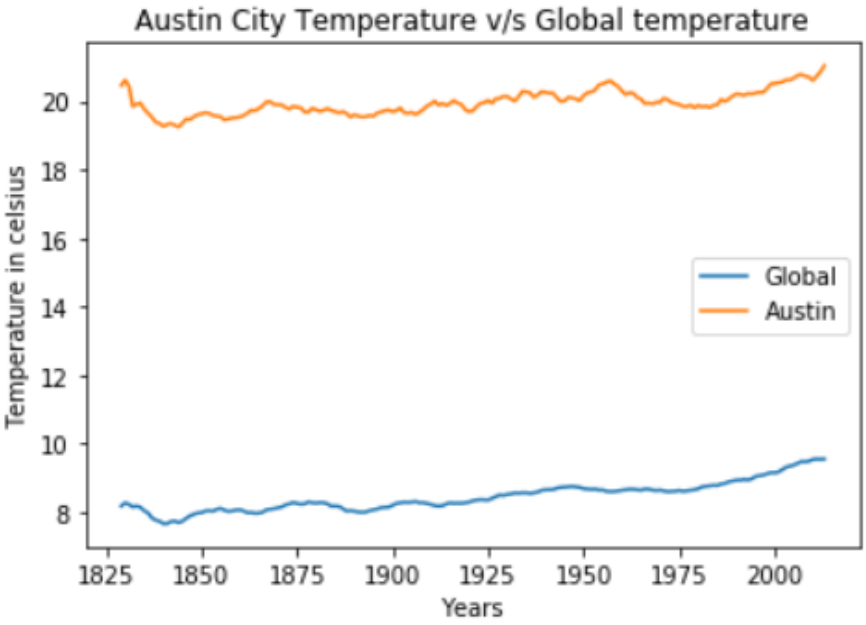
```
In [6]: glb_mv_avg = global_temp1['avg_temp'].rolling(10).mean()
        local_mv_avg = city_temp['avg_temp'].rolling(10).mean()
```

3. What were your key considerations when deciding how to visualise the trends?

The key consideration was to determine in the timeframe for data visualisation. Looking at the local temperature data for Austin, the data covers period between **1825** to **2013** , where in the global temperature data covers the period between **1750** and **2015.** Therefore, the analysis was performed for the range between **1825** to **2013.** To map local and global temperature data the above method is used it is shown as below:

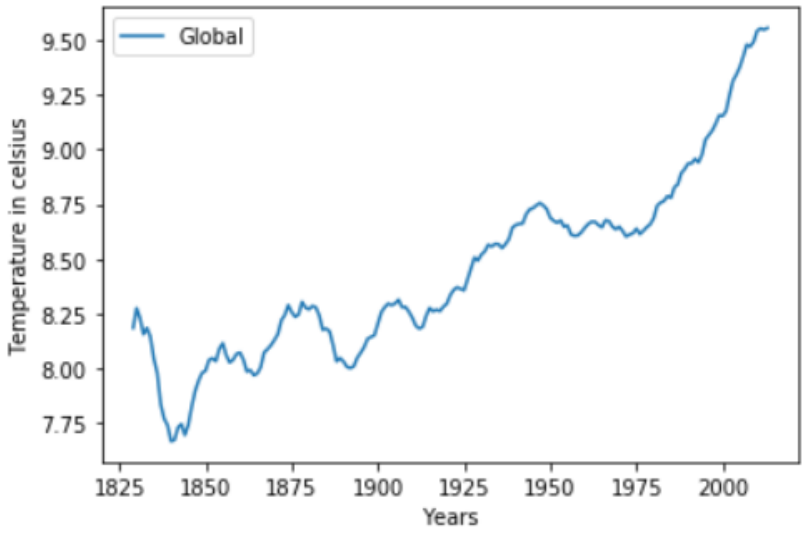
```
In [3]: global_temp1 = global_temp[70:264]

In [4]: global_temp1
```

Line chart is as follow:

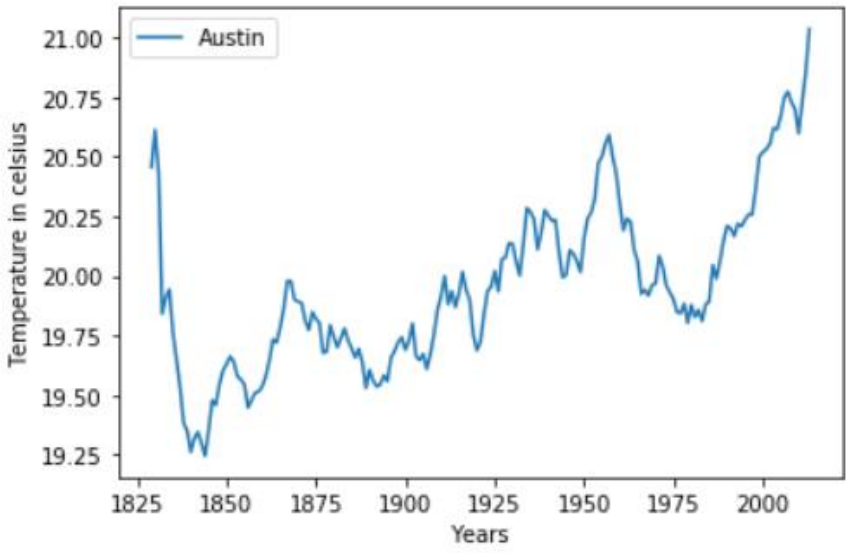


Austin city temperature v/s Global temperature

The other charts are as follows:



Global average temperature



Austin city average temperature

Observations:

- By noticing the chart it shows that the temperature is raising over the years due to climate change.
- The Global temperature started to raise 'exponentially' since the middle of 1800 which happened to be the same data as oil mining
- Since 1975 the temperature is raising without any stops
- The difference between year 1800 and ~ 2010 in temperature is more than 2 degrees in the global average chart (increasing)
- The difference between year 1800 and ~ 2010 in temperature is more than 3 degrees in the Austin city average chart (increasing)
- Austin city temperature dropped in 1975 then started increasing
- Austin city is getting hotter over time
- The change of the climate between Austin and globe is slightly small, both are of them are increasing.