EXPLORE WEATHER TRENDS PROJECT

Date:02/06/2020

STEP 1 :Extraction of Data From Database

- Extraction of data from SQL.
- Next from the temperatures database, I extracted city data, global data.
- City data and global data was extracted from temperatures database.
- I created a query to check the which cities are available in India.
  SELECT * FROM city_list WHERE country LIKE 'India'
- City was selected as Delhi.
- Using the below query to extract global data.
  SELECT * FROM global_data
- The below query shows extracting by city's data.

  SELECT * FROM city_data
  WHERE city = 'Delhi' AND country = 'India';
- In the below query I combined the two different data sets into one.
  SELECT global_data.year,global_data.avg_temp as global_temp,city_data.avg_temp as city_temp
  FROM global_data
  JOIN city_data
  ON global_data.year = city_data.year
  WHERE city = 'New Delhi'

Step 2: To plot my results I have used jupyter notebook .

In [4]:
```
import numpy as np
import pandas as pd
from matplotlib import pyplot as plt

#Reading the csv file that was created using SQL
df = pd.read_csv(r"C:\Users\siddh\Downloads\results.csv")
df
```

Out[4]:

	year	global_temp	city_temp
0	1796	8.27	25.03
1	1797	8.51	26.71
2	1798	8.67	24.29
3	1799	8.51	25.28
4	1800	8.48	25.21
...	...	...	...
213	2009	9.51	26.55
214	2010	9.70	26.52
215	2011	9.52	25.63
216	2012	9.51	25.89
217	2013	9.61	26.71

218 rows × 3 columns

In [28]:
```
# Create Function to calculate moving avarage
def moving_average(rolling_range, my_data):
    moving_avg=my_data.rolling(window=rolling_range, on='city_temp').mean().dropna()
    return moving_avg
```

```
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    moving_avg=my_data.rolling(window=rolling_range, on='city_temp').mean().dropna()
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moving_avg_graph = moving_average(30, df)
```
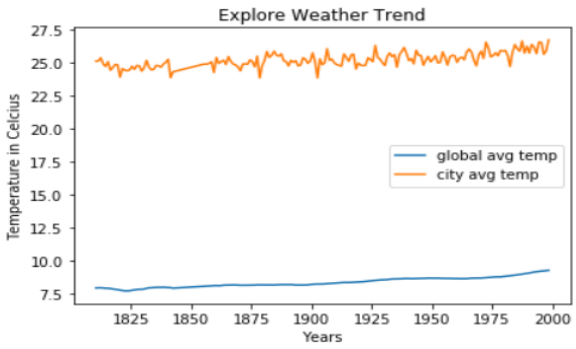

n [15]:
```
#Use of Matplotlib library for visualization
plt.plot(moving_avg_graph['year'], moving_avg_graph['global_temp'],label='global avg temp')
plt.plot(moving_avg_graph['year'], moving_avg_graph['city_temp'],label='city avg temp')

plt.title('Explore Weather Trend')
plt.legend()
plt.ylabel('Temperature in Celcius')
plt.xlabel('Years')
plt.show()
```



Step 3: Observations

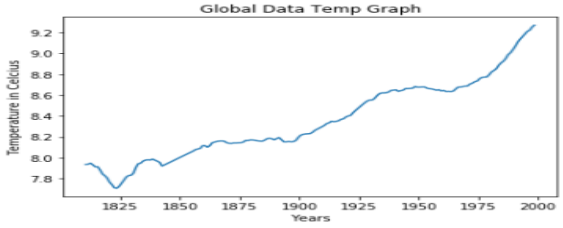
1. Using moving average function I started changing the values until I got a smooth graph. There was a pretty unstable graph between the years 10 to 100, beyond that I was able to get a smooth graph.

2. Looking at the graph I viewed that Delhi city temperature was much hotter as compared to global average temperature. This is due to the fact that the average temperatures of Delhi is much higher than the global temperatures.

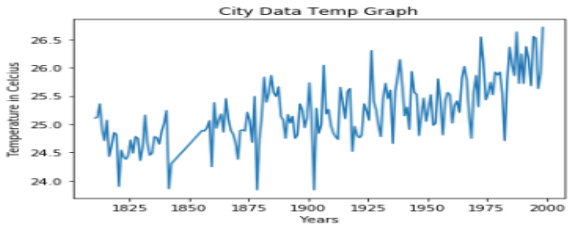
3. From the graph I observed that there has been an increase in the global temperature over the years without a drop in temperature.

4. On the other hand the Delhi's temperature is quite increasing with time. There has also been years when there can been a dip in temperature. Hence the average temperature of Delhi is quite fluctuating.

```
In [4]: plt.plot(moving_avg_graph['year'], moving_avg_graph['global_temp'],label='global avg temp')
        plt.xlabel('Years')
        plt.ylabel('Temperature in Celcius')
        plt.title('Global Data Temp Graph')

Out[4]: Text(0.5, 1.0, 'Global Data Temp Graph')
```




```
In [5]: plt.plot(moving_avg_graph['year'], moving_avg_graph['city_temp'],label='city avg temp')
        plt.xlabel('Years')
        plt.ylabel('Temperature in Celcius')
        plt.title('City Data Temp Graph')

Out[5]: Text(0.5, 1.0, 'City Data Temp Graph')
```



5. I tried to plotting graph of global data because we see that we can't infer much from the above graph as the line is less inclined. Om plotting it separately I found that with increase in years there was also a increase in global average temperature and the increase was quite regular without much drop in temperature.

6. From the Delhi's graph I observed that for some years there has been increase in temperature while some years there has been decreasing. Between the years from 1890 to 1895 and from 1905 to 1910 there was quite drop in city temperature by 2.5-3 Celsius.

7. I further find out the maximum and minimum temperature of Delhi. The maximum temp recorded was 26.71 Celsius which was in the year 2013.