UDACITY – DATA ANALYST NANODEGREE

PROJECT 1 - EXPLORING WEATHER TRENDS

Neha Ranganath
Bangalore, India
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Overview:

Global and city-wise yearly average temperature data has been provided. The objective of the project is to extract relevant data and compare global temperature data to the temperature data of a particular city. As a part of this requirement, 7 year moving average of yearly temperature has been calculated and line graphs have been plotted.

Objectives:

1. Extract the relevant data from the database
2. Calculate moving averages for the global temperature data and the city temperature data
3. Plot line graphs for the extracted data
4. Highlight key observations comparing global temperature data to the selected city temperature data

Tools Used:

1. SQL: To extract the data from the database

2. Microsoft Excel: To calculate moving averages of global and city temperatures and to plot line charts.

Procedure:

STEP 1

Extraction of data from the database

1. Find the nearest city to me in the list from the ***city_list*** table

SQL Query:

To check for value 'Bangalore' in the ***city_list*** table

```
SELECT *
FROM city_list
WHERE City='Bangalore';
```

2. Extract city temperature data from ***city_data*** and global temperature data from ***global_data*** to a common result set and exporting to a CSV file.

SQL Query:

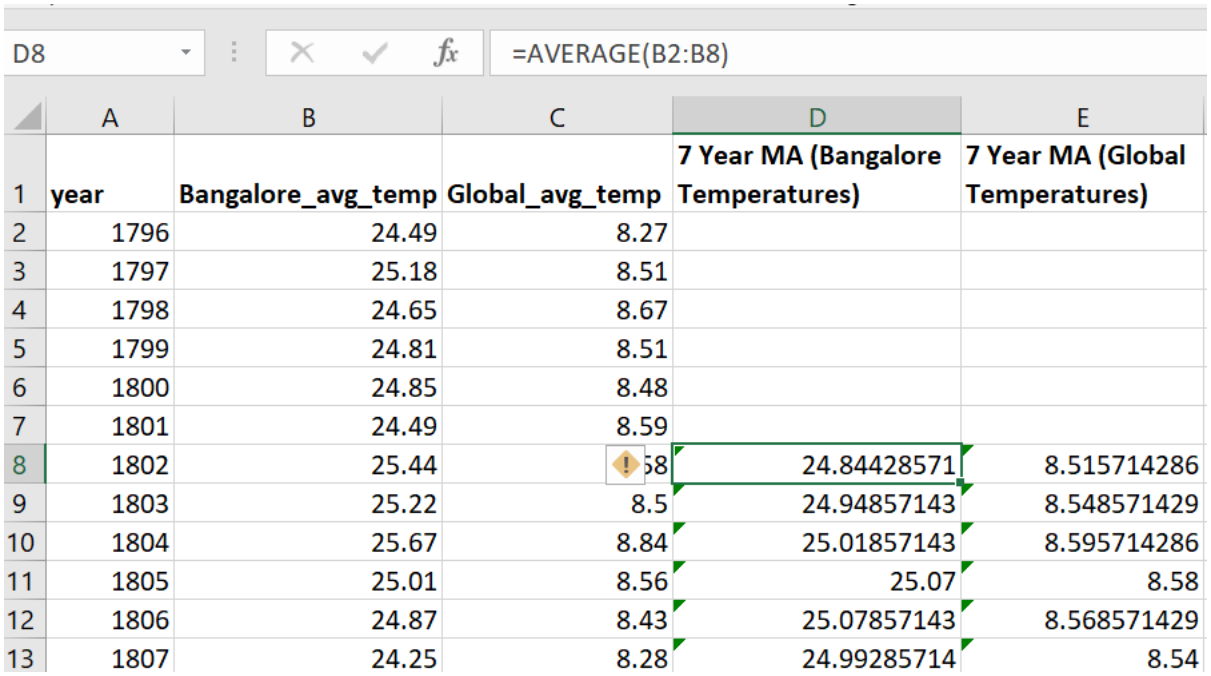
```
SELECT cd.year, cd.avg_temp AS city_avg_temp, gd.avg_temp AS global_avg_temp
FROM city_data cd
JOIN city_list cl ON cl.city=cd.city
JOIN global_data gd ON cd.year=gd.year
WHERE cd.city='Bangalore' AND cd.avg_temp IS NOT NULL;
```

/*adding IS NOT NULL to remove rows where city temperature value was null from the calculations*/

STEP 2

Calculate 7 year moving average values for global temperature data and city data using the AVERAGE() function on Microsoft Excel.

Example: =AVERAGE(B2:B8)



D8 =AVERAGE(B2:B8)

	A	B	C	D	E
1	year	Bangalore_avg_temp	Global_avg_temp	7 Year MA (Bangalore Temperatures)	7 Year MA (Global Temperatures)
2	1796	24.49	8.27		
3	1797	25.18	8.51		
4	1798	24.65	8.67		
5	1799	24.81	8.51		
6	1800	24.85	8.48		
7	1801	24.49	8.59		
8	1802	25.44	58	24.84428571	8.515714286
9	1803	25.22	8.5	24.94857143	8.548571429
10	1804	25.67	8.84	25.01857143	8.595714286
11	1805	25.01	8.56	25.07	8.58
12	1806	24.87	8.43	25.07857143	8.568571429
13	1807	24.25	8.28	24.99285714	8.54

The same steps were followed for the remaining city and global temperature data values.

STEP 3

Plotting line graphs on Microsoft Excel.

X-Axis: Year

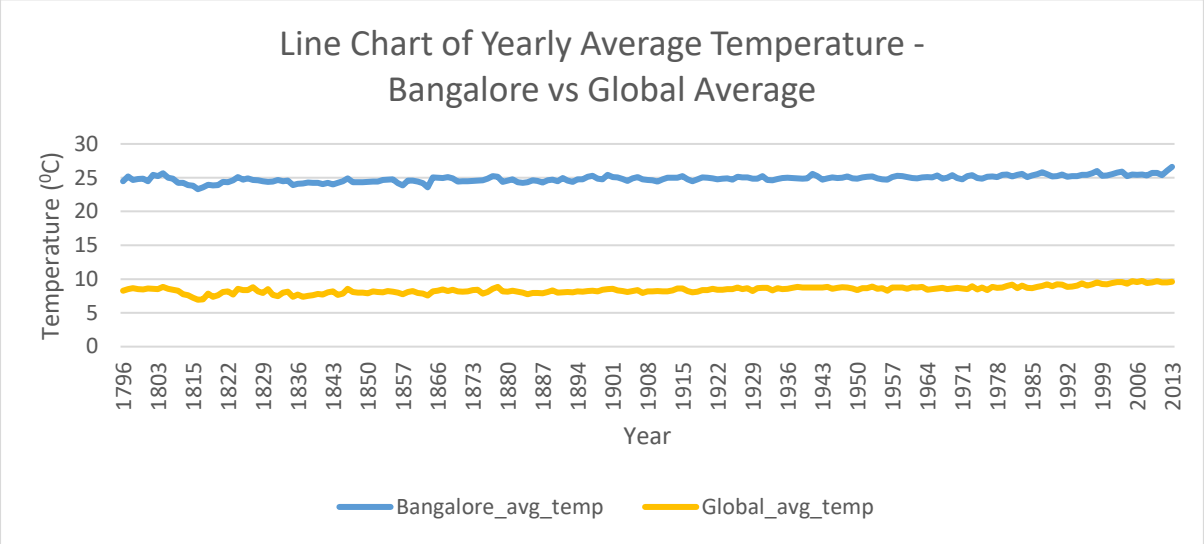
Y-Axis: Temperature (°C)

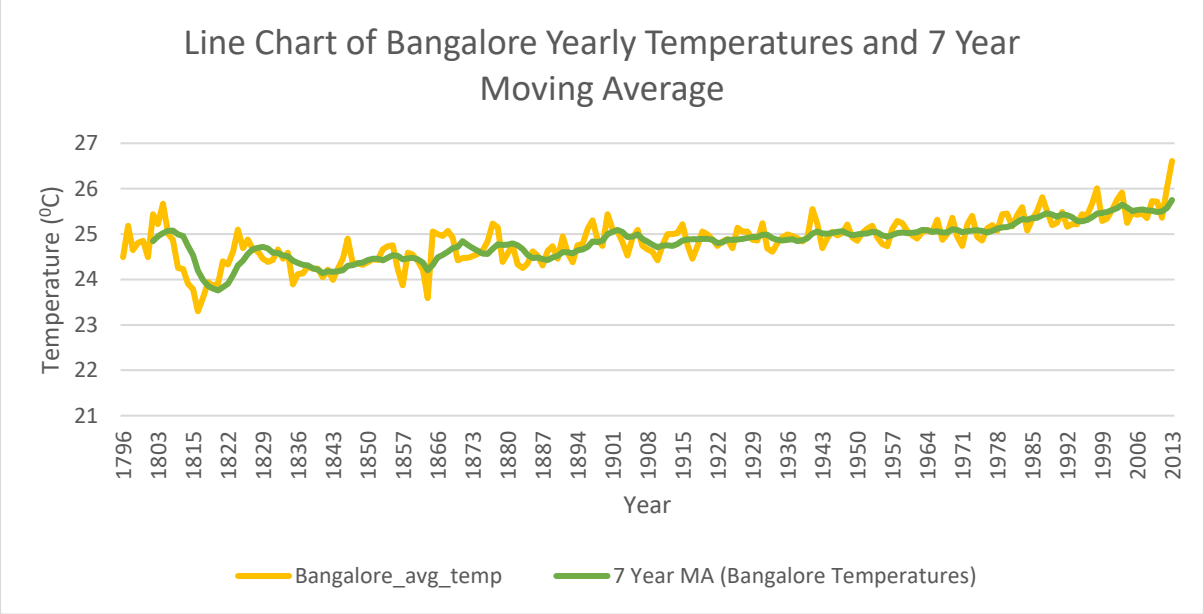
Legend is indicated for each of the following line charts:

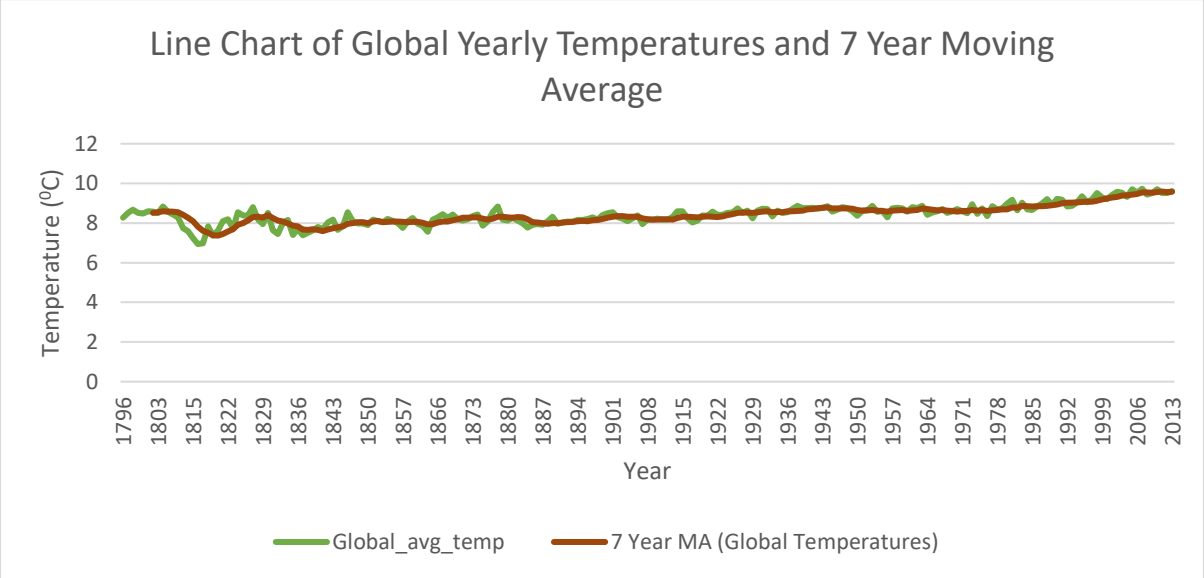
1. Yearly Average Temperature - Bangalore vs Global Average

2. Bangalore Yearly Temperatures and 7 Year Moving Average

3. Global Yearly Temperatures and 7 Year Moving Average


Line Chart of Yearly Average Temperature - Bangalore vs Global Average
Temperature (⁰C)
30
25
20
15
10
5
0
1796 1803 1815 1822 1829 1836 1843 1850 1857 1866 1873 1880 1887 1894 1901 1908 1915 1922 1929 1936 1943 1950 1957 1964 1971 1978 1985 1992 1999 2006 2013
Year
Bangalore_avg_temp
Global_avg_temp


Line Chart of Bangalore Yearly Temperatures and 7 Year Moving Average
Temperature (⁰C)
27
26
25
24
23
22
21
1796 1803 1815 1822 1829 1836 1843 1850 1857 1866 1873 1880 1887 1894 1901 1908 1915 1922 1929 1936 1943 1950 1957 1964 1971 1978 1985 1992 1999 2006 2013
Year
Bangalore_avg_temp
7 Year MA (Bangalore Temperatures)


Line Chart of Global Yearly Temperatures and 7 Year Moving Average
Temperature (⁰C)
12
10
8
6
4
2
0
1796 1803 1815 1822 1829 1836 1843 1850 1857 1866 1873 1880 1887 1894 1901 1908 1915 1922 1929 1936 1943 1950 1957 1964 1971 1978 1985 1992 1999 2006 2013
Year
Global_avg_temp
7 Year MA (Global Temperatures)

Key Observations:

1. Global temperature moving average ranges from 8.5°C to 9.6°C, showing an increase of 1°C over the time period recorded.

2. Bangalore city temperature moving average value ranges from 24.8°C to 26.6°C, showing a increase of 1°C over the last 40 years.

3. There is a sharp increase in Bangalore's average temperature from 2007 to 2013.

4. Bangalore city average temperature is approximately triple the global average temperature, due to its subtropical climate.

5. Both global average temperature and city average temperature has been rising steadily over the years, as seen in the moving average values of the line plot.