Udacity

Data Analyst Nanodegree

Project 1 : Exploring Weather Trends

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Steps taken to prepare data:

Extracting data from database

1. First, I used SQL queries to check the nearest city option available. I chose Pune from the list.
   Query: select * from city_list where country = 'India';
2. Then I used SQL queries to visualize if both global and Pune's data are available for same years. Here, I found that data for Pune city is not available for some of the years.
   Query 1: select * from city_data where city = 'Pune' and country = 'India'
   Query 2: select * from global_data
3. For comparison, I renamed local and global temp columns
   Query 1: ALTER TABLE global_data RENAME COLUMN avg_temp to global_avg_temp;
   Query 2: ALTER TABLE city_data RENAME COLUMN avg_temp to local_avg_temp;
4. Now I extracted global and local data for the years which is available for Pune city
   Query: select global_data.year, city_data.city, global_data.global_avg_temp, city_data.local_avg_temp FROM global_data, city_data WHERE ((global_data.year=city_data.year) and (city_data.city = 'Pune' and city_data.country = 'India'))
5. Once the csv file was downloaded, I opened it in Excel and calculated moving average for both local and global temperatures. I calculated moving average for 7 years.
   Formula used for global_avg_temp: =AVERAGE($C2:$C8) copied till last row
   Formula used for local_avg_temp: =AVERAGE($D2:$D8) copied till last row

F8 =AVERAGE(D2:D8)

	A	B	D	F
1	year	city	local_avg_	Pune Moving average
2	1796	Pune	24.39	#N/A
3	1797	Pune	25.17	#N/A
4	1798	Pune	24.05	#N/A
5	1799	Pune	24.68	#N/A
6	1800	Pune	24.67	#N/A
7	1801	Pune	23.94	#N/A
8	1802	Pune	25.18	24.58285714
9	1803	Pune	24.95	24.66285714
10	1804	Pune	25.33	24.68571429
11	1805	Pune	24.8	24.79285714
12	1806	Pune	24.68	24.79285714
13	1807	Pune	24	24.69714286

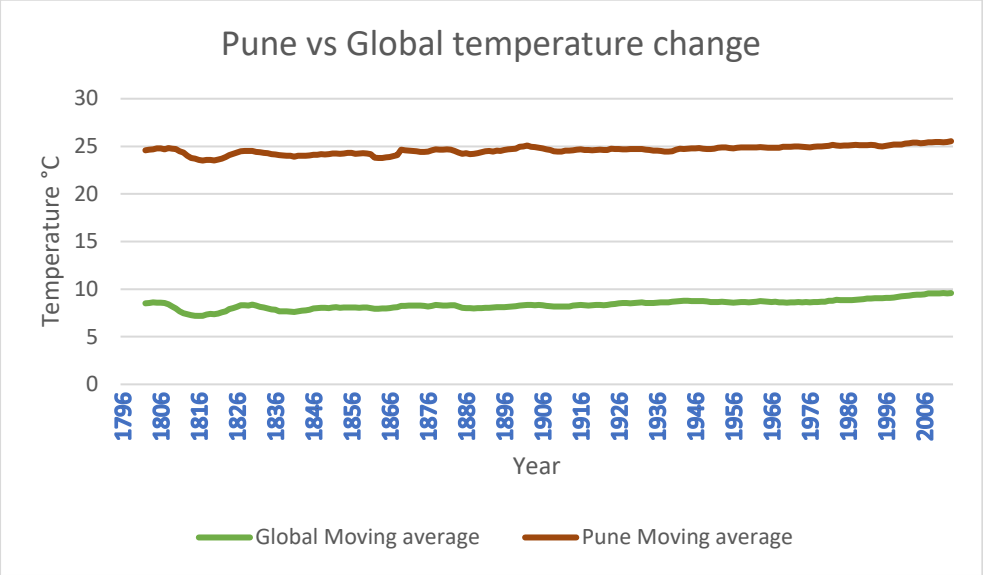
E8 =AVERAGE(C2:C8)

	A	B	C	E
1	year	city	global_av	Global Moving average
2	1796	Pune	8.27	#N/A
3	1797	Pune	8.51	#N/A
4	1798	Pune	8.67	#N/A
5	1799	Pune	8.51	#N/A
6	1800	Pune	8.48	#N/A
7	1801	Pune	8.59	#N/A
8	1802	Pune	8.58	8.515714286
9	1803	Pune	8.5	8.548571429
10	1804	Pune	8.84	8.595714286
11	1805	Pune	8.56	8.58
12	1806	Pune	8.43	8.568571429
13	1807	Pune	8.28	8.54

6. Then I plotted line charts for global and local temperatures.

City and global temp.csv

Chart:



Observations:

1. Global average temperature trend started increasing slightly from 1980. Pune's average temperature started increasing after 1998.
2. From year 1862 to 1869, Pune's average temperature dropped slightly even though global average moving temperature remained almost the same.
3. From year 1847 to year 1980, the average global temperature varied slightly while for Pune, the change in average temperature was significantly higher.
4. From 1870 to 1885, the curve's of Pune's temperature trends maintains higher variance when compared to global temperature in the line chart. Hence, we can conclude that Pune was hotter as compared to global average temperature during that time.
5. In 1803, the difference between the moving average temperature of Pune and global is:
   24.66-8.55 = 16.11
   In 2013, the difference between the moving average temperature of Pune and global is:
   25.53-9.57 15.96
   This says that overall temperature difference between Pune and global temperatures has decreased slightly in 2013 as compared to 1803.
6. The overall trends of Pune and global temperatures are increasing gradually day by day.