Project 1

Exploring Weather Trends

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Outline

I compared both Rosario's and Córdoba's distance to Buenos Aires since those were the only two Argentine cities that appeared on the database and I live in Buenos Aires. I chose to use Rosario as reference since it's approximately 180 km from Buenos Aires (174 miles) and Córdoba is around 700 km (435 miles). However there was not much difference between both temperatures.

I used SQL to extract the needed data from the database and to calculate the moving average taking into account groups of 5 years. I used Postgres Rolling Average tutorial* but changed query to take into account 5 and not 7 years.

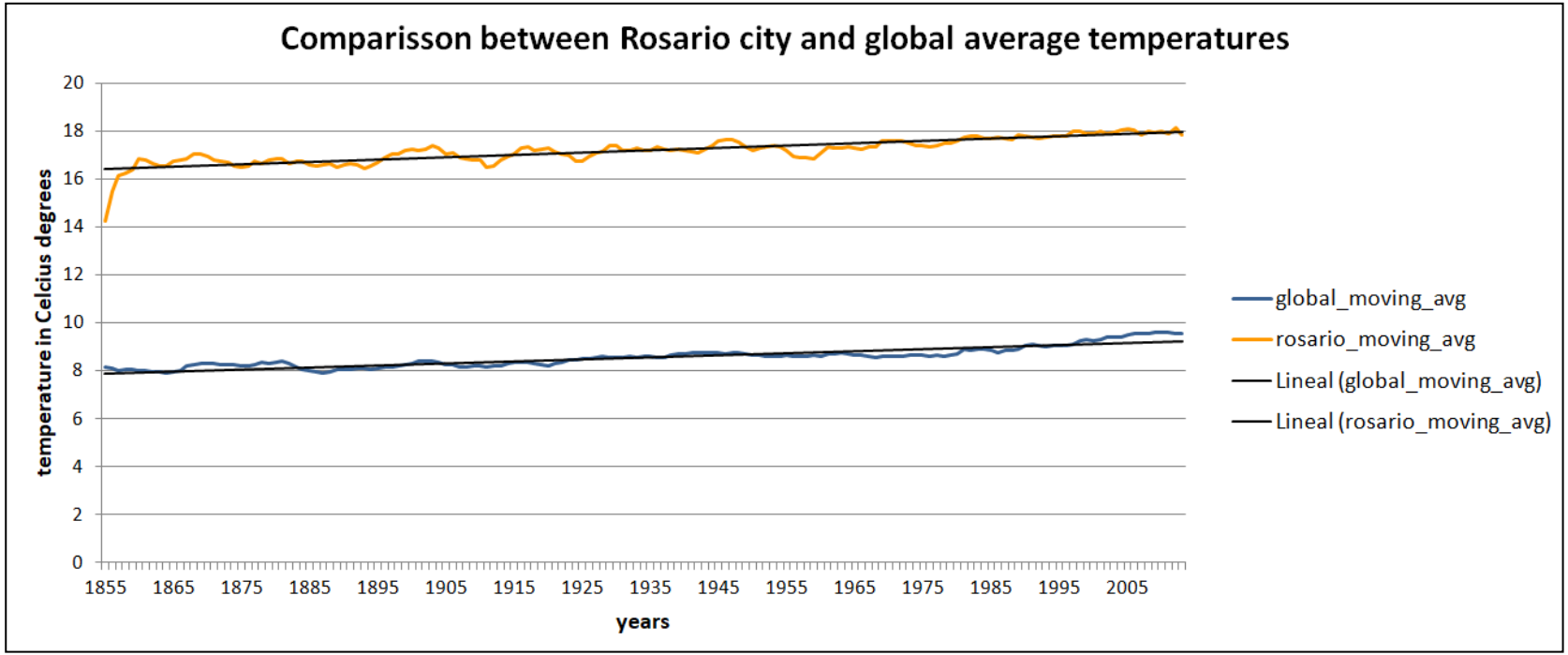
Once in Excel, I cleaned data since I noticed that Global data started on 1700 and both Rosario and Cordoba started on 1855. Also global data finished in 2015 and both argentine cities data finish in 2013. This could have also been done with SQL with a BETWEEN clause but I noticed once I was on Excel so I cleaned it there.

```
SELECT          *,
                AVG(avg_temp)
                OVER (ORDER BY year ASC
                ROWS BETWEEN 4 PRECEDING AND CURRENT ROW) AS rosario_moving_avg
FROM city_data
WHERE city = 'Rosario'

SELECT          *,
                AVG(avg_temp)
                OVER (ORDER BY year ASC
                ROWS BETWEEN 4 PRECEDING AND CURRENT ROW) AS global_moving_avg
FROM global_data
```

* https://www.periscopedata.com/blog/rolling-average

Line Chart: Comparison between Rosario city and global average temperatures



1. Is your city hotter or cooler on average compared to the global average?

From the graph it can be seen that ***Rosario is not only hotter on average than global average but almost its double***.

Taking into account a 5 number comparison between global's and Rosario's average, it can be seen that the difference considering global average minus Rosario's average divided by 2 doesn't even reach to 1 centigrade showing that Rosario's average temperature is almost global's average double.

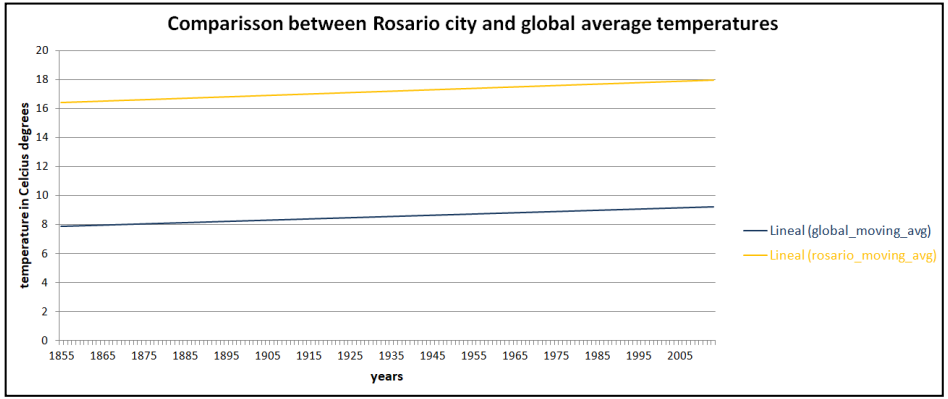
	global_moving_avg	rosario_moving_avg	Rosario/2	global-Rosario/2
Min	7.89	14.22	7.11	0.78
Q1	8.23	16.80	8.40	0.17
Q2 - Median	8.55	17.20	8.60	0.05
Q3	8.73	17.57	8.78	0.05
Max	9.58	18.14	9.07	0.51
Range	1.69	3.92	1.96	0.27
Average	8.55	17.17	8.59	0.03

2. How do the changes in your city's temperatures over time compare to the changes in the global average?

By looking into both tendency lines on the graph it can be seen that ***in both cases temperatures have been rising steadily***.

However, there is a difference in global temperature from the first 1855 data of 8.128º to 9.57º in 2013 of 1,442º and a range of 1.69 from min to max temperatures during these years; while on Rosario, the first 14,22º and last 17.834º have a difference of 3,614º and range is 3.92.

This means that the relationship of Rosario's average being the global's one double remains through time.



3. What about the last 20 years?

	Global	Rosario
1993	9.01	17.75
2013	9.57	17.83
Range	1.69	3.92
Difference	0.56	0.08
Percentage	33.29	2.09

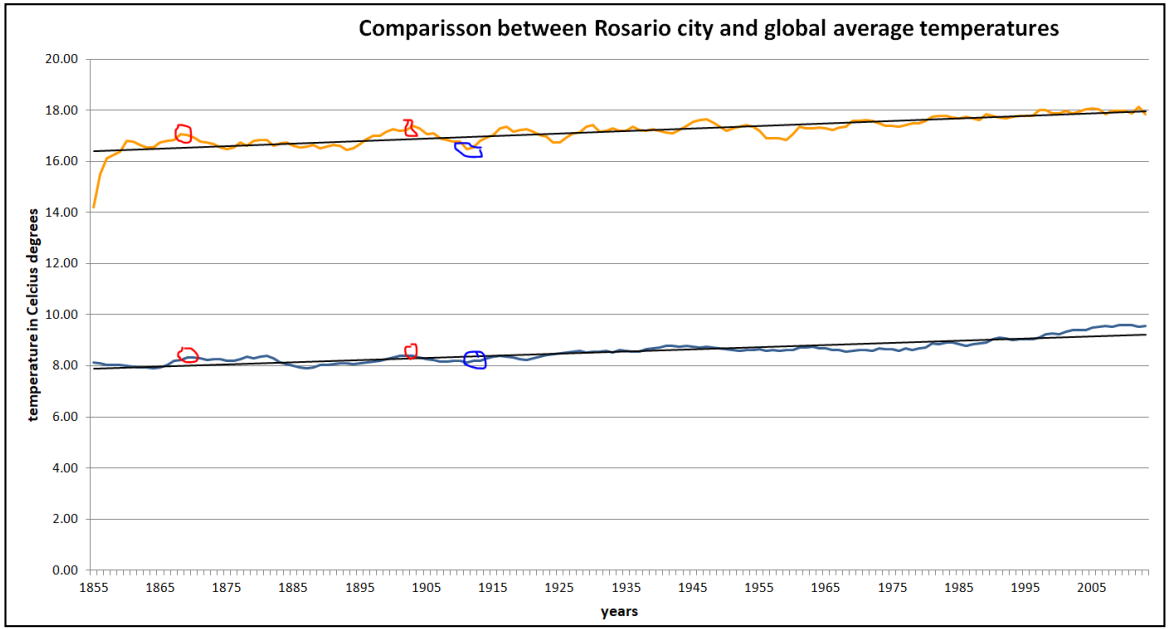
By inspecting temperatures from 1993 and comparing to 2013 both for Rosario and global average, it can be seen that although 5 number summary shows a steady relationship between both temperatures from 1855 and 2013, if we take into account the last 20 years of the database, global average has increased a lot faster during these last years compared to the change in Rosario's temperature.

Global average shows an increment of 0.56 degrees between 1993 and 2013 while Rosario just 0.08. Being that Rosario's temperature's range is 3.92, that difference only represents a 2.09% of range while the 0.56 degrees global increment represents a 33.29% of 1.69 global temperature's range.

4. Are there cooler or hotter years for both global and Rosario?

It can be seen that although variation is not always the same, most times when temperature increases on Global, it also does on Rosario and vice versa implying that Rosario is not extent from global trends.

Examples of this can be year 1868 showing an increase in temperature for global from 8.20º to 8.23º and on Rosario from 16.83º to 17.05º or year 1902 showing an increase on both global and Rosario too from previous years.



The same can be seen on temperature decrease such as year 1911 going to 8.14º from previous year's 8.18º on global and 16.49º on Rosario from previous 16.78º.