Data Science Bootcamp

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Anomalies of temperatu
in RJ and rainfalls of SP

Facts about Brazil

- 212 million people (2020).
- Largest American Latin country.
- All European Union could fit twice.
- It has 60% of the global density of rain forest.
- Foulish government.
- No protection of the Amazonia forest.
- Really beautiful, people smile all the time and there is Carnival.

Drought São Paulo 2014-2017

- The lack of water ------->energy rationing + water rationing.
- Agricultural disaster.

Questions:

- How bad were the levels of precipitation in SP-203-2016?
- What about the anomalies of temperatures in SP?
- How do the anomalies of temperatures in RJ relate?

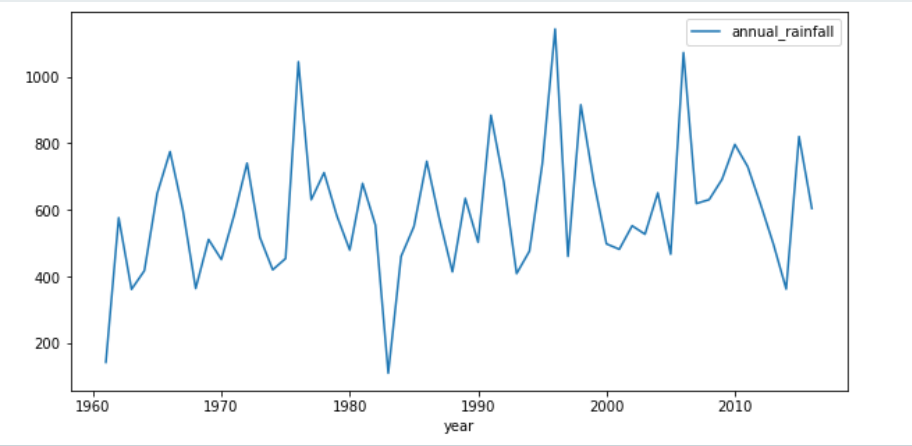
Sources

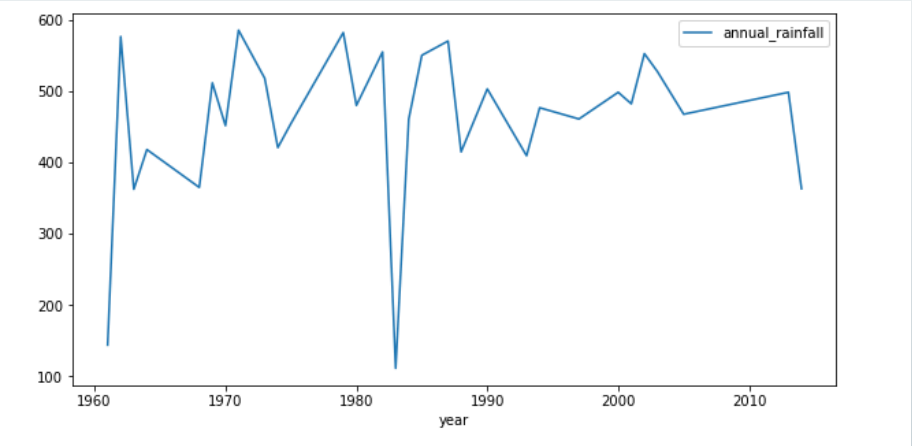
- Temperatures (monthly 1961-2017): https://data.giss.nasa.gov/gistemp/

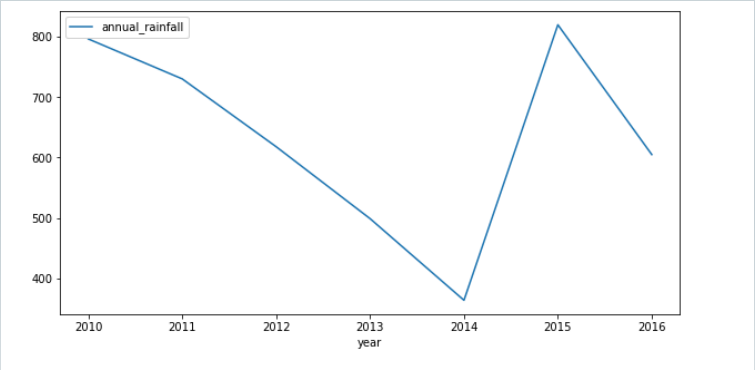
- Pluviosity SP (1961-2017): https://www.kaggle.com/arkanius/rain-intensitty-in-so-paulo/metadata

- CO2 (1961-2017):
- https://www.kaggle.com/srikantsahu/co2-and-ghg-emission-data?select=emission+data.csv

The annual rainfalls in SP (1961-2017)







Exploratory analysis:

- Critical local point of minimum in 2014

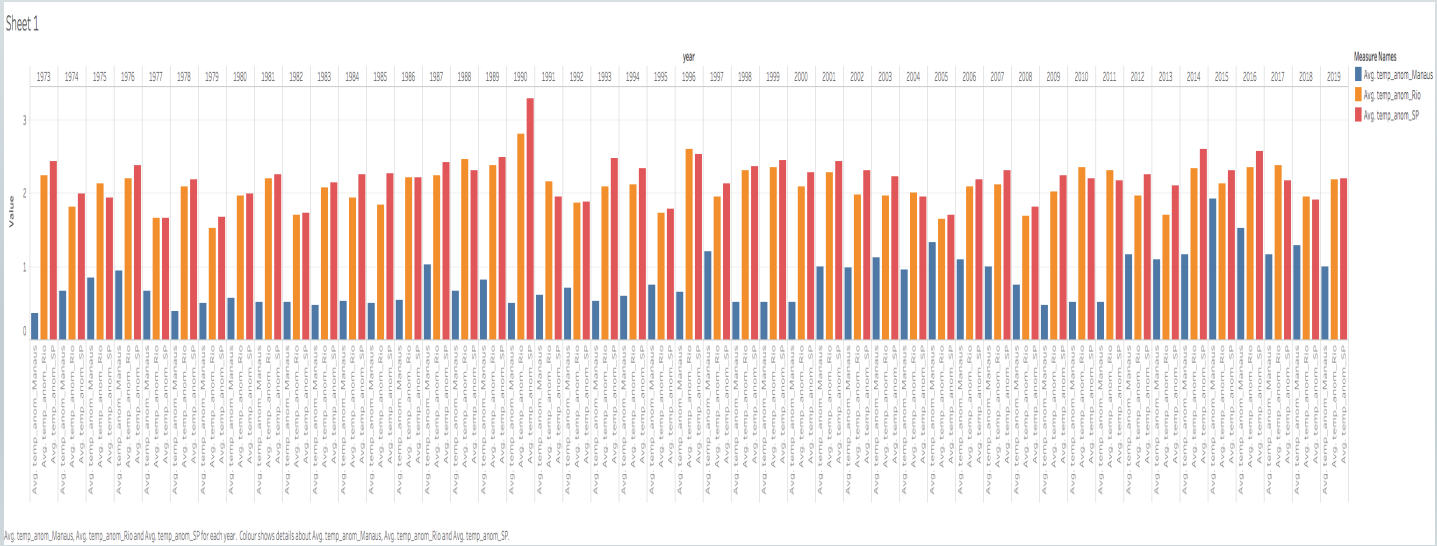
	year	annual_rainfall
49	2010.0	796.6
50	2011.0	730.4
51	2012.0	618.0
52	2013.0	498.8
53	2014.0	363.5
54	2015.0	820.1
55	2016.0	605.0

Critical minimum: 363.5

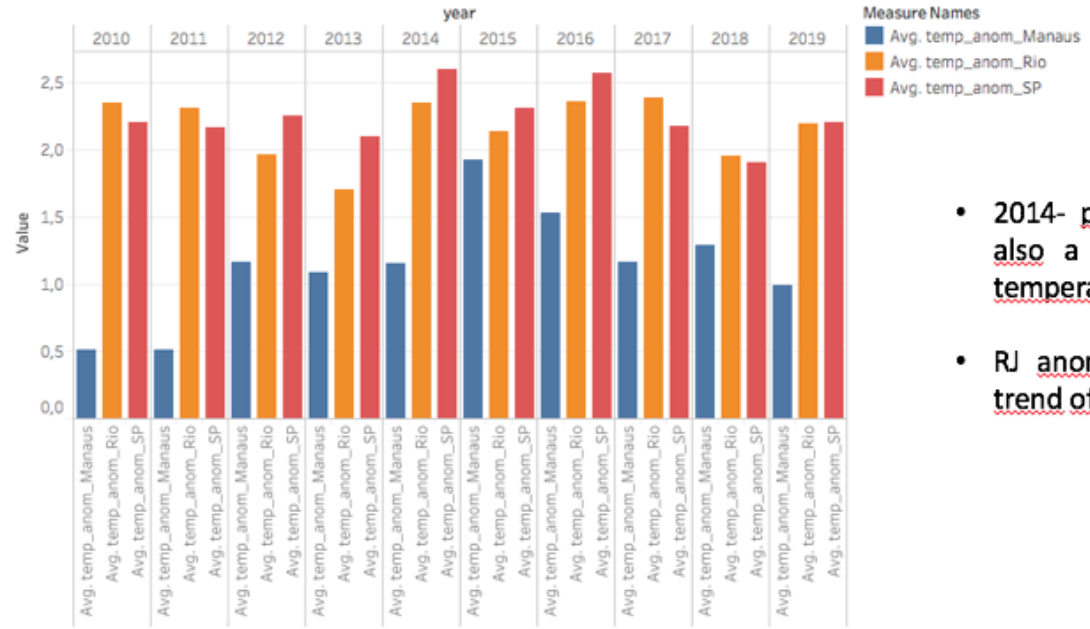
- How were the temperature anomalies registered back then?

Anomalies temperatures

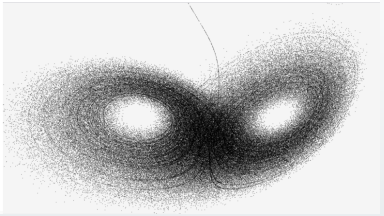
- Anomaly temperature: absolute deviation from the median registered by each location(3 cities: SP, RJ, Manaus)



Anomalies of temperatures



- 2014- pick of the drough in SP is also a maximum local point for temperature anomalies.
- RJ anomalies seem to follow the trend of the anomalies of SP. How?

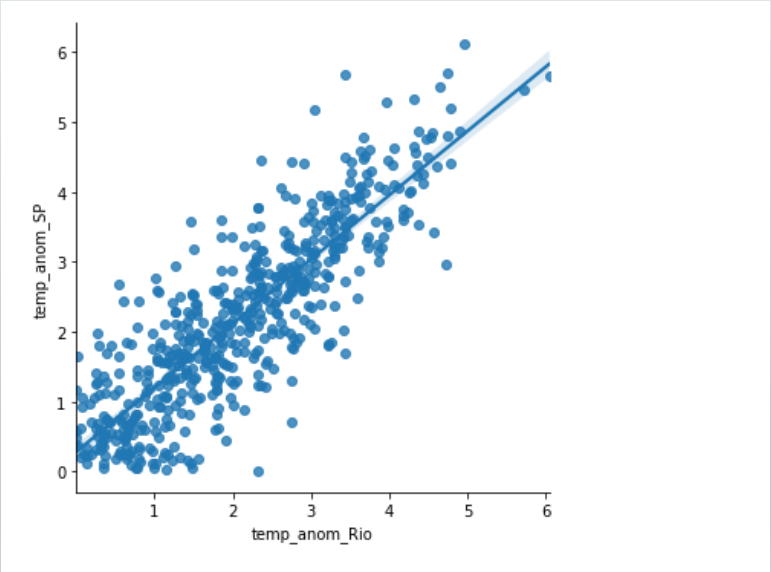


Statistical tests and predictions:

- The annual total precipitation and the averaged annual temperature do not show good evidences of correlation.
- Exogenous variables are missing: deflorestation, termohilinic circulation, atmospheric pressure, Golf stream.
- Mathematical equations for climate models are highly nonlinear.
- Dataset is too sparse.

Anomalies temperatures Anomalies RJ/SP

- High correlations: Spearman=87%



05]:

	features	values
1	temp_anom_SP	1.025049
2	avtemp_Manaus	0.029714
0	avtemp_SP	-0.021538
3	temp_anom_Manaus	-0.059482

Studying the anomaly temp Rio >0.62

- 0.62- critical anomaly averaged globally noticed in 2010 (critical warm year)

- At a level of precision 89% and accuracy 87% under the hypothesis of the model and under the replication of the the observed temperatures we expect high registers with anomalies greater than 0.62

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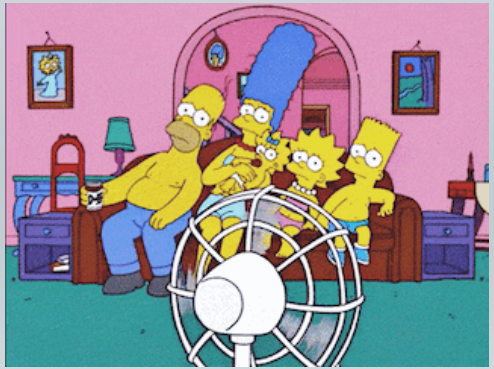

Merci, muito obrigado et