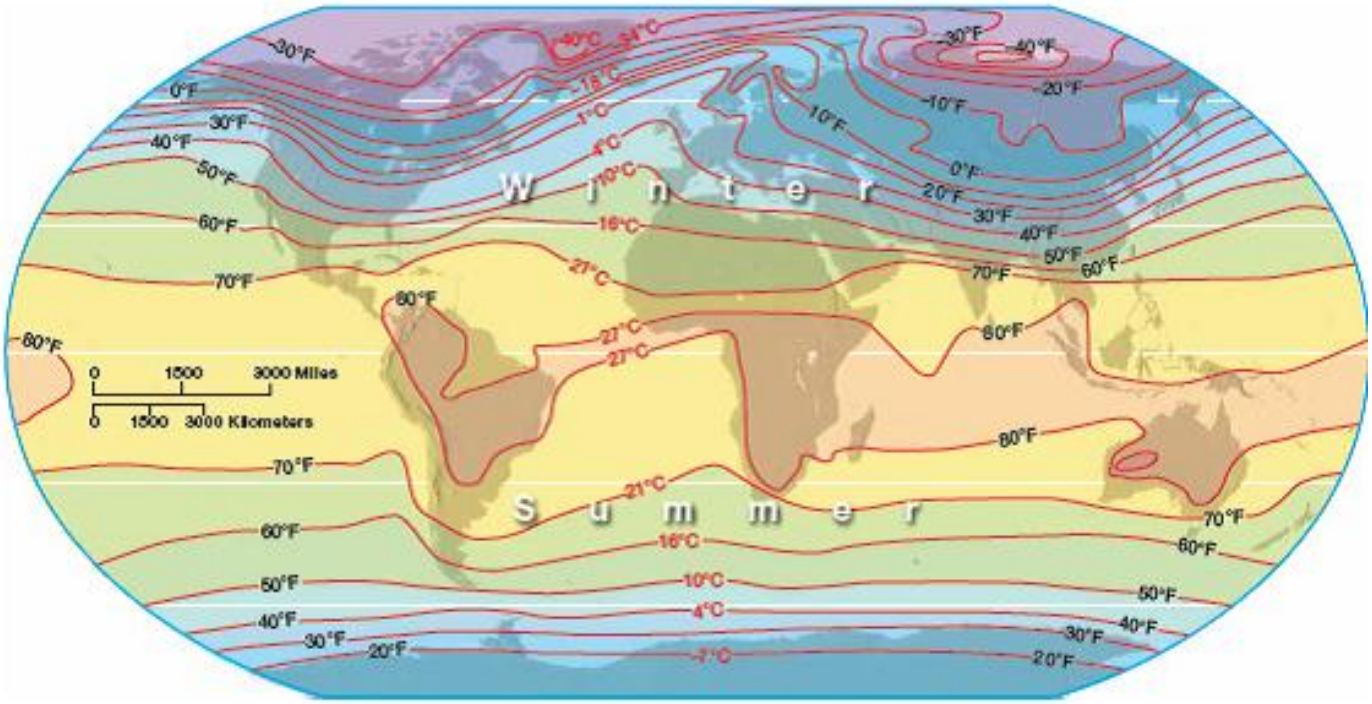


Temperature contrasts around the world

23/12/2020 to 09/01/2021

Javier Olcoz Macayo

mrjolma@gmail.com

Data Science

The Bridge

General Vision

In this project we have studied how does the temperature change around the world focusing on the relation it has with the latitude. The heating of the Earth's surface it's due to the solar radiation income. Part of this is reflected by the atmosphere but a big quantity penetrates into the surface. This radiation is transformed into energy and released as infrared rays that produces heat. That energy is maintained due to the greenhouse effect. Depending on the latitude, the amount of solar radiation income changes and that implies changes on the temperature. What I have done is to study that changes and see which is the better way to study it.

Goals

Because of the distribution of my data I have done almost everything from options C, B and A. From option C, I have documented the steps, used trello, collected the data, cleaned it, represented in a pie chart the time needed for each section, answered the questions asked in option C. From option B, I've made histograms from the columns of the dataset that I considered more significative, drown the correlation matrixes of the sidnificative datasets and I've used Matplotlib. From option A, I've saved each graph in a local file (.png or .jpg), I've used modules for each funcionality, I've used seaborn aswell for some graphs and answered the questions asked.

Specifications

Software

The program has been created for Windows. Python 3 needed (pandas, numpy, matplotlib.pyplot, seaborn). Folders organised as given.

Hardware

8GB RAM, i5 or higher microprocessor, 17.7 MB memory free on hard disc.

Requirements

No requirements are needed, all the data is given in the essay.

Steps

I. Research the context

I was interested in climate change and searching for information about it, I discovered the Nasa website from where I downloaded the data. I deepen into the topic and I started seeing things that could be interesant such as the differences between the cold and warm zone of the planet and how climate affects the temperature. So it was there when i started setting the hypothesis, which are:

1. It is better to study the hot zone of the planet with robust statistics.

2. The big amount of climates in the South Hemisphere makes the latitude not the only variable that the temperature depends on.

II. Get Data

I downloaded the data from the Nasa website and readed in excel to see if the data were appropiate or not for the proyect.

After validating the data, I overturned it to python and started working.

III. Data Wrangling

The data was quite easy to work with, as I could expect because they come from the NASA. The columns were good structured and the visualitation was perfect from the beggining to the end. The only problema was the amount of NaN results that we had in our dataset.

IV. Data Mining / Clean Data

The first thing I had to do was to see if the data for every latitude were significative, I mean, at least 50 valid data per latitude. Then I calculate some statistics for each latitude in order to demonstrate my hypothesis.

After that I clean divide the dataframes into months dataframes and calcúlate the mean and median for each one. I group those means and medians into dataframes and work with them in order to offer better graphics.

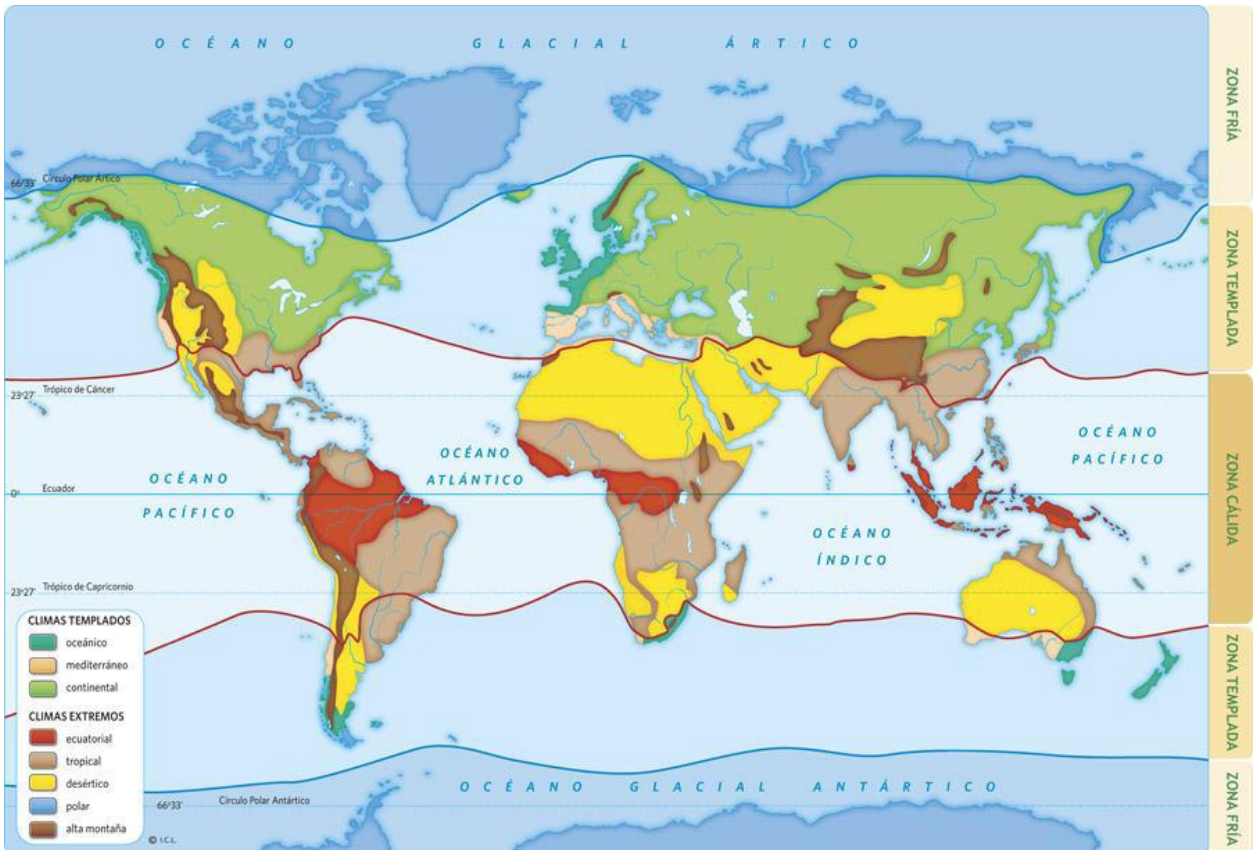
V. Visualitation

Once I had all the data cleaned and ready to see the results, I graph all the data I needed to see if my hipothesis were correct.

Conclussions

I could see that my first hypothesis was not right, the mean and the median was almost the same for every latitude in the planet and the std and the IQR were only different in the Equator. The correlation matrix made me see that this differences are bigger at nighttime.

The second hypothesis was demonstrated. By looking at every graph of the std or the IQR, I could see that in the latitudes from S 23.5º to S 60º the graphs were fuzzy so that means that the latitude was not the only relevant variable.


OCÉANO GLACIAL ÁRTICO
66°33' Círculo Polar Ártico
23°27' Trópico de Cáncer
0° Ecuador
23°27' Trópico de Capricornio
66°33' Círculo Polar Antártico
OCÉANO PACÍFICO
OCÉANO ATLÁNTICO
OCÉANO ÍNDICO
OCÉANO PACÍFICO
OCÉANO GLACIAL ANTÁRTICO
CLIMAS TEMPLADOS
oceánico
mediterráneo
continental
CLIMAS EXTREMOS
ecuatorial
tropical
desértico
polar
alta montaña
© I.C.L.
ZONA FRÍA
ZONA TEMPLADA
ZONA CÁLIDA
ZONA TEMPLADA
ZONA FRÍA