

The Interplay of Crop Plantation and Climate Change: Cultivating Understanding for a Sustainable Future

Arash Mousavi July 2024

Agenda



- 1. Introduction
- 2. Datasets
- 3. Visualization
- 4. Result
- 5. Conclusion





3

Introduction





- how various types of crops affect the climate change
- if there is a link between the increase of country temperature and the amount of crops being harvested
- Example concepts that can be interepreted:

Introduction

- how is the temperature trend
- What crops are commonly produced
- Which crops have better effects?



Loading Datasets

Datasets

We go over datasets that are picked for this project



<u>Climate Change: Earth Surface Temperature</u> Data

Global Food & Agriculture Statistics

Published by:

Data gathered by Berkely Earth
 Laboratory

Some Factors:

- date
- Average Temperature
- AverageTemperatureUncertainty
- Country
- Latitude
- Longitude

Gathered by:

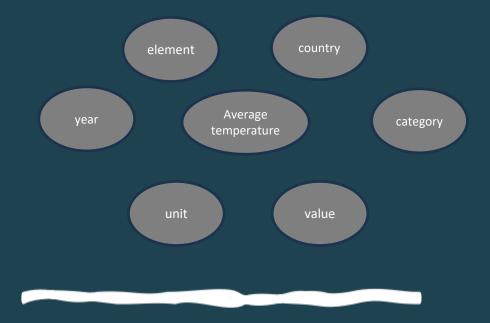
United Nations based on 1961 until 2007

Some Factors:

- country_or_area
- element_code
- element
- year
- value
- unit
- category
- value footnotes

<class 'pandas.core.frame.DataFrame'> RangeIndex: 371868 entries, 0 to 371867 Data columns (total 7 columns): Column Non-Null Count Dtype 371868 non-null object element 371868 non-null float64 year unit 371868 non-null object 371868 non-null float64 category 371868 non-null object Country 371868 non-null object average_yearly_temperature 371868 non-null float64 dtypes: float64(3), object(4) memory usage: 19.9+ MB

Final Dataset Info



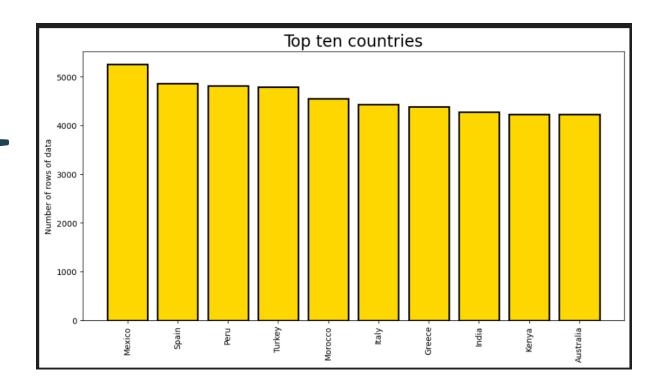
July 10, 2024 Technische Fakultät 7



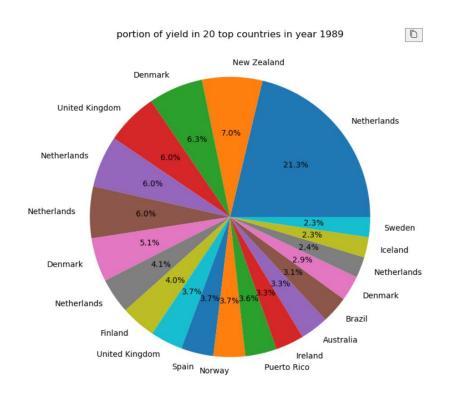
Data Visualization

Dataset Visualization

- Categorical Variable
- Based on regional indicatior





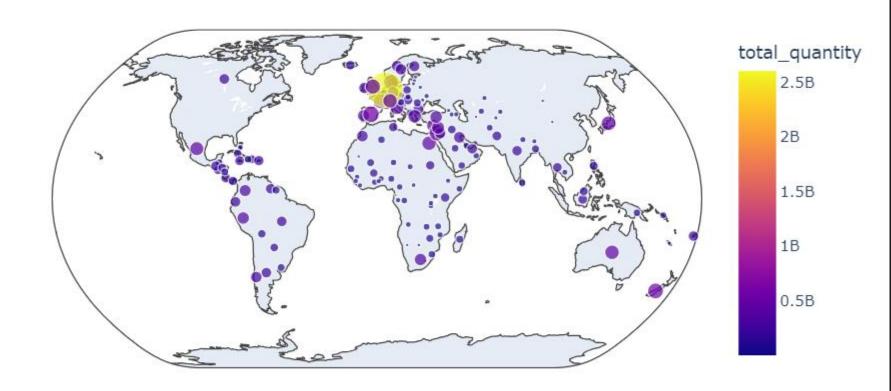


Dataset Visualization

Top 20 products by countries



Bubble Map of Sum by Country



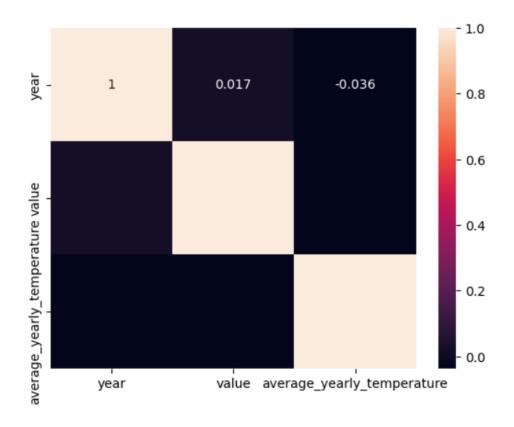


Result

Technische Fakultät 17. Januar 2024 12

Correleation Matrix for the final Data

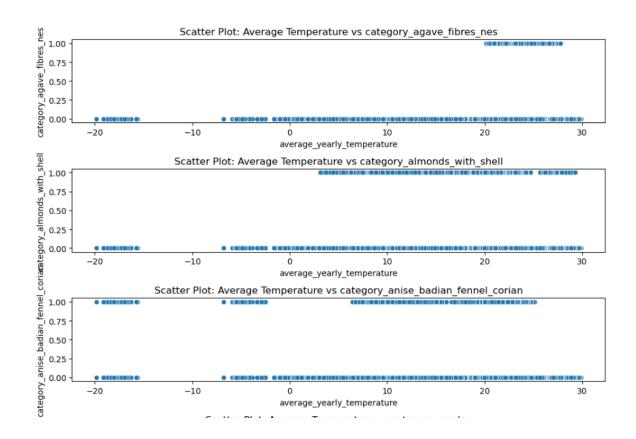
- used to summarize data
- Through this the relation between data is clarified
- The variables show the relation and trend between them





Dataset Visualization

- for visualizing the relationship between two continuous variables
- create scatter plots to see how every crop is distributed on which temperature

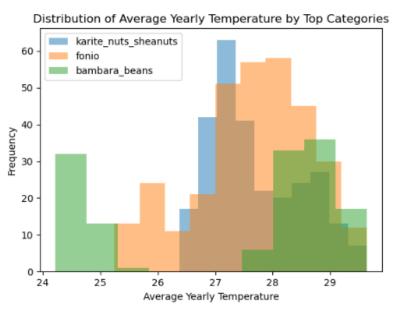


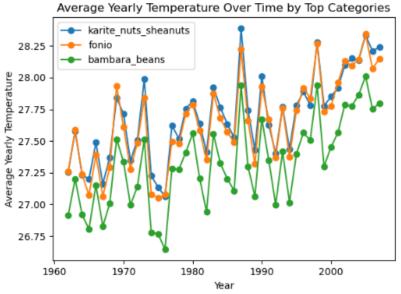


Dataset

Visualization

Checking the categories and their trends

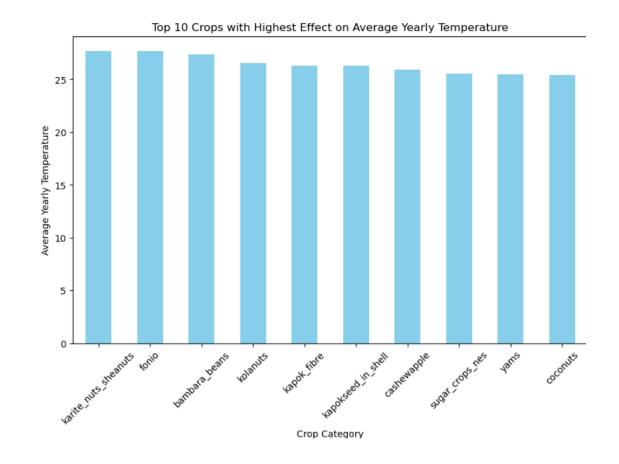






Dataset Visualization

Plotting the most effective crops

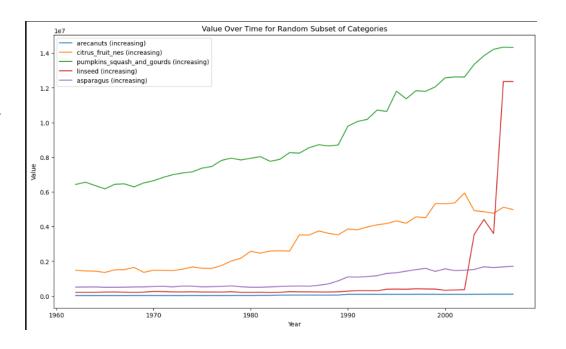




17

Dataset Visualization

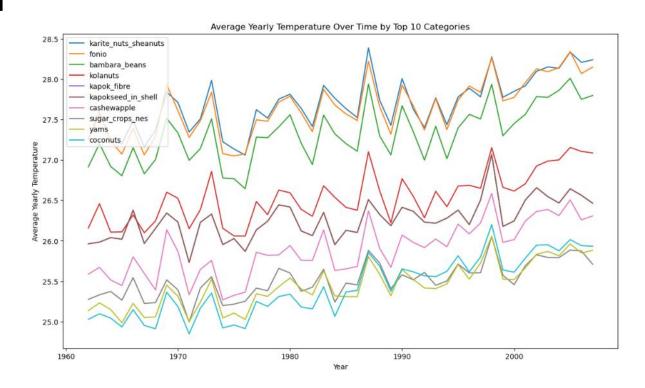
- Using time series to check the trend over time
- Here we see the value of these products over time





Dataset Visualization

Temperature time series for products



Results



19

The unexpected correlation between crops and temperature indicates a far more intricate and sophisticated look at this greatly mysterious project. As previously explained, there are several factors and elements with regard to choosing an alternative crop that will reduce the temperature to an extent but has other disadvantageous effects on the economy and geo policy. Due to this fact, a far more comprehensive research must be conducted with meticulous data regarding all the effectual aspects. To achieve such thriving goal, one must have access to way sophisticated models with a plethora of data to train Neural networks and other more advanced tools to find these intricate patterns.



20

Discussion



21

Disscussion

Possible Explanations

Fluctuation trend:

Sudden increase in temperature even with a decrease in production shows a direct effect of overall global population increase and a great effect of alternative foods and harvestings to compensate for the ever growing population of the world. Another important concept is the fact that the great increase of temperature in the world is interconnected and a surge in India's production will have indirect geo effects on European weather and nature.

Social structures and behaviors:

Better agricultural methods and modern approaches and standards such as the Netherlands methods which is a top player and most important producer makes greater difference than the less advanced and effective methods of South American countries

Hidden reasons:

Global warming is affected by various factors and the agriculture sector is indeed a key part of the industrial world, however, there are several other aspects such as production facilities and the use of fossil resources that have their significant effect on that specific period of time.

Considerations and Limitations:

Data Quality and Variability:

Acknowledging limitations related to data accuracy, completeness, and consistency across diverse countries is crucial.

Multifactorial Nature:

Economic status alone may not fully explain infection rates; various factors like population density, governance, and cultural norms like eating certain crops might contribute significantly



Thanks for your attention