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GitHub Link:
https://github.com/anaskhan55/ads_assignment3

Climate Change

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Abstract

World faces flood and drought more often than anyone can believe in different parts of the country year after year and the cycle seems to continue infinitely. I've created this dataset to find out if there is anything we can learn from history and if we can co-relate in with global weather patterns and climate change.

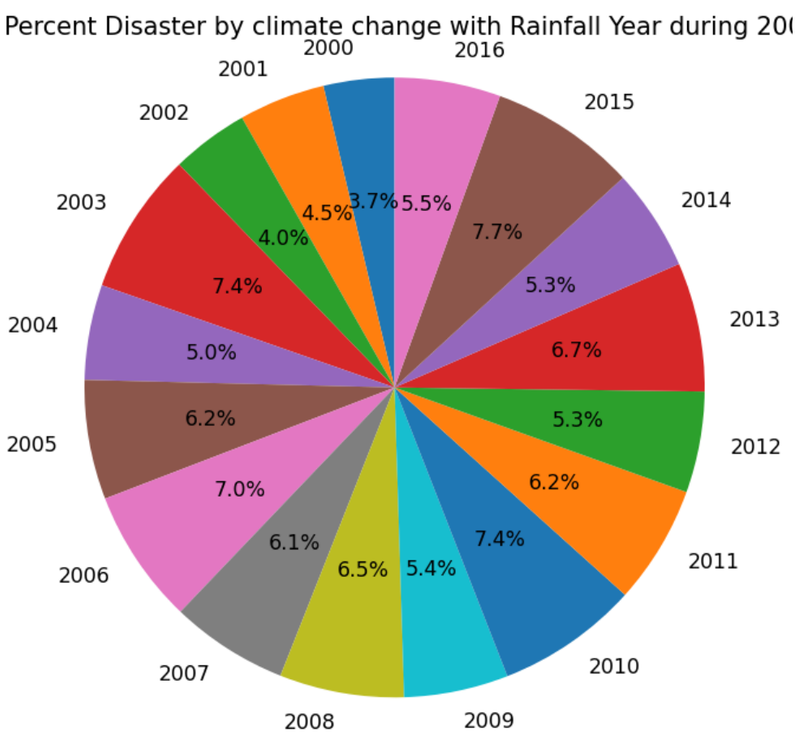
Introduction

The world is experiencing increasingly frequent occurrences of both floods and droughts in various regions year after year, perpetuating an ongoing cycle that seems to be endless. In an attempt to understand if there are any insights to be gained from historical data and if there is a correlation with global weather patterns and climate change.

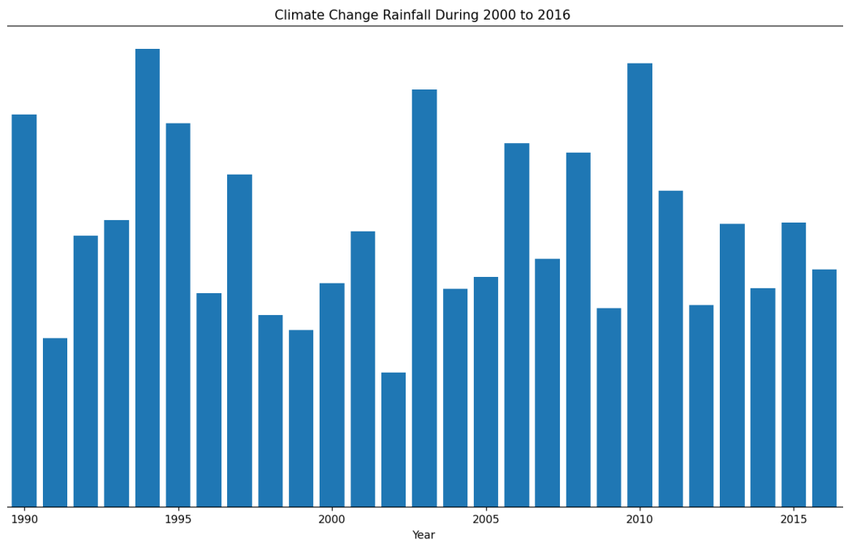
Clustring

K-means clustering is an iterative algorithm that partitions a given dataset into K distinct clusters, where K represents the desired number of clusters specified by the user. The algorithm starts by randomly initializing K cluster centroids in the feature space. It then assigns each data point to the nearest centroid based on a distance metric, commonly Euclidean distance. After assigning all the data points to clusters, the algorithm recalculates the centroids by taking the mean of all the data points within each cluster. This process iterates until convergence, where the cluster assignments and centroids no longer change significantly.

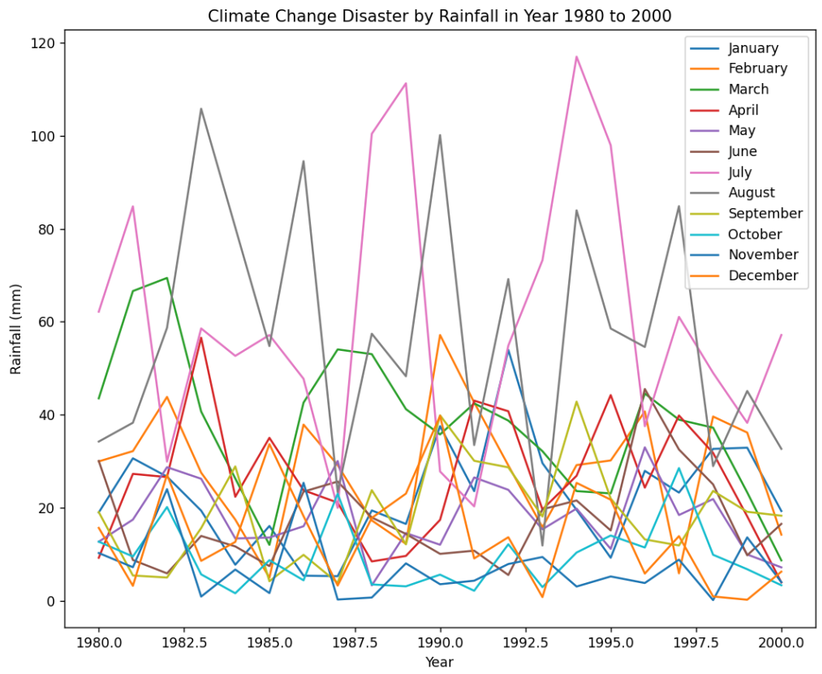
Climate Disaster



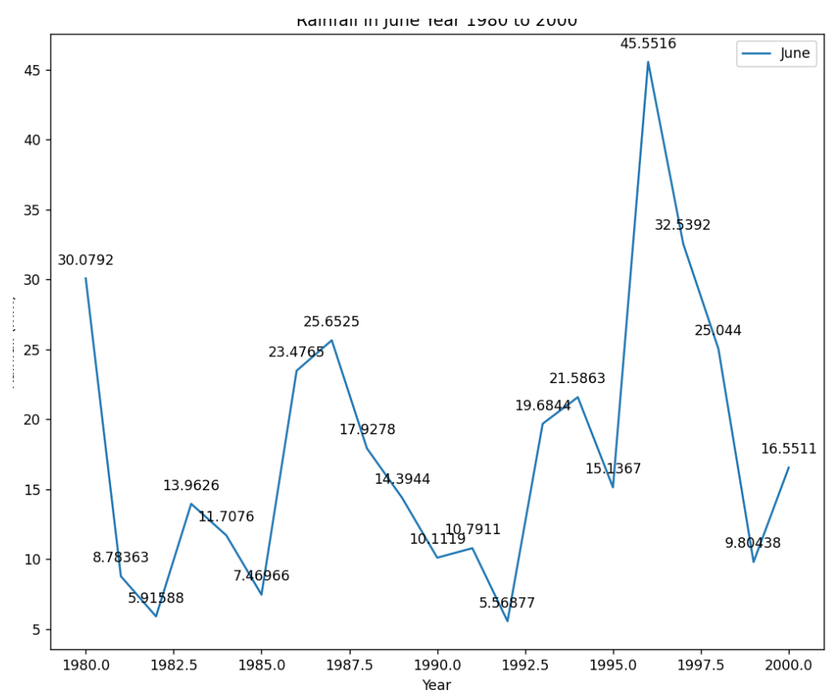
Through a bar graph, This allows you to observe temporal rainfall trends and variations between different years. The height of each bar in the graph represents the amount of rainfall



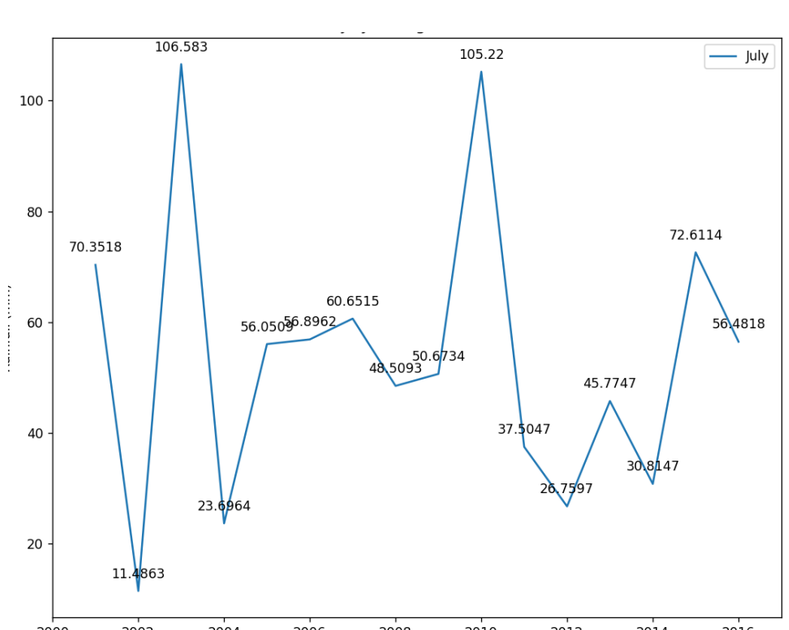
Climate change disaster by rainfall in year 1980 to 2000



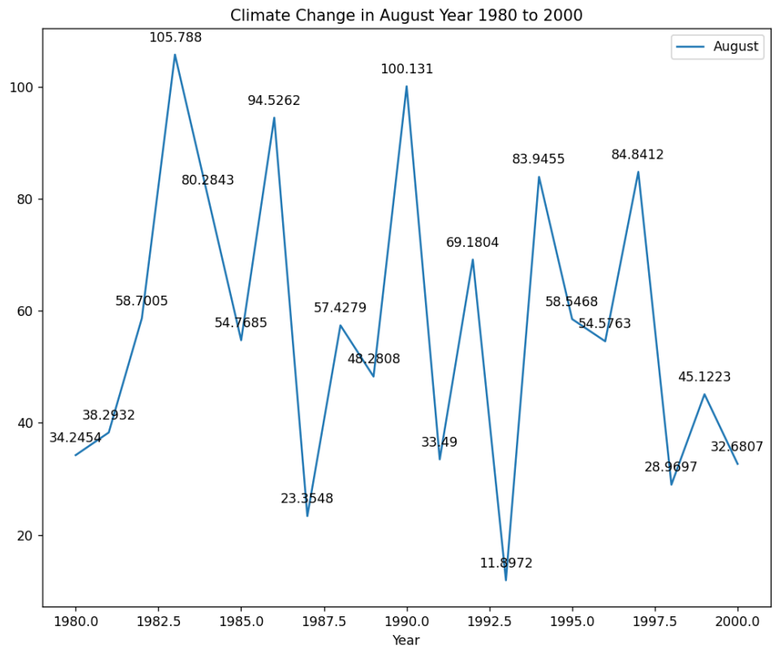
climate change by the month of june 1980 to 2000



climate change by the month of July 1980 to 2000

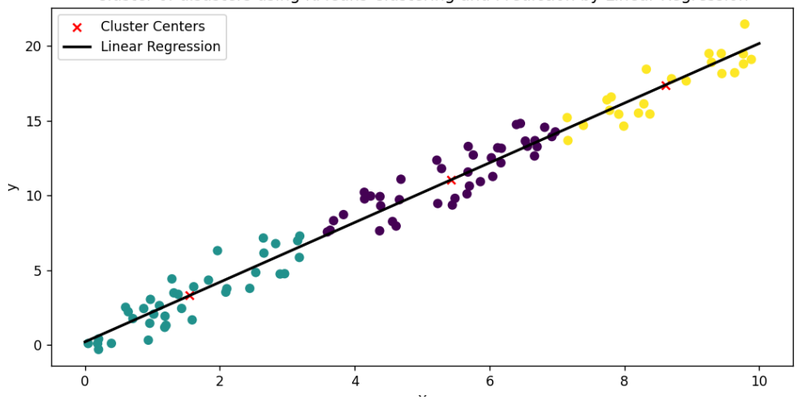


climate change by the month of august 1980 to 2000



Number of Clusters and Kmeans Prediction

- We use the text() function to display the Kmeans value on the second subplot (ax2).
- We hide the axis of the second subplot using ax2.axis('off').
- We adjust the spacing between subplots using plt.subplots_adjust().
- Finally, we adjust the spacing between the subplots to make sure they are well-positioned and well-separated. We do this using the plt.subplots_adjust() command, which lets us adjust the parameters that control the spacing and positioning of the subplots.



Conclusion

Long-term Trends: The dataset allows us to observe long-term trends in rainfall patterns. By analyzing the data over a span of 100 years, we can identify any consistent shifts or changes in rainfall amounts.
Variability: The dataset likely exhibits significant variability in rainfall from year to year.
Fluctuations in rainfall amounts over the 100-year period may indicate natural climate variability or the influence of other factors
The dataset can provide insights into the impact of climate change on rainfall. By examining long-term trends and comparing them with historical climate data, it may be possible to identify whether the observed changes in rainfall align with the expected impacts of climate change with predictions

Refrences

https://www.kaggle.com/datasets/waseemmscs92/rainfall-dataset