OTOT - Task B D3.js
NAVEEN KUMAR JAKUVA PREMKUMAR - A0212252X

Title: Earth Temperature Anomalies
Dataset Name: 10_EarthTempAnomalies.csv
Data Source: https://dataviz.comp.nus.edu.sg/datasets/10
Dataset Description:

Column Name	Variable Type	Description
year	Numerical	The Year when the temperature readings were measured. 1880 - 2020
Hemisphere	Categorical	Which division of the globe the temperature readings were measured. Totally 3 divisions : a) Global Hemisphere b) Northern Hemisphere c) Southern Hemisphere
Months from Jan to December	Numerical	Temperature anomaly data readings measured in the mid of the month. It spans from January to December.
J-D	Numerical	The monthly mean average of the temperature anomaly reading measured for the corresponding year.
D-N	Numerical	Annual mean average from Dec of year to Nov of the subsequent year.
DJF	Numerical	Winter seasonal average from Dec to Feb, often known as the boreal winter.
MAM	Numerical	Spring seasonal average from Mar to May.
JJA	Numerical	Summer seasonal average from Jun to Aug
SON	Numerical	Autumn seasonal average from Sept to Nov

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Purpose of Visualization :

This dataset has the global surface temperature change from the year 1880 to 2020. This gives us a complete idea of how the surface temperature changes year by year corresponding to the 3 hemispheres stated above. Some purpose of the visualizations is given by:

a) Analyzing the trend in the global surface temperature change from 1880 to 2020.
b) Which season has an abrupt change in the global surface temperature and trying to find the root cause of it.
c) Which region of the globe is suffering from an abnormal change in global surface temperature reading.

Visualization 1 : Month Vs Temperature Anamoly Readings Diverging Bar Chart

Queries Answered :

a) **Which month of the given year has more/less anomaly in the global surface temperature change of the given hemisphere?**
b) **What is the anomaly reading associated with specific a month of given year and given hemisphere?**

Insights Found :

a) Anomaly readings of every month were negative in the year 1880 and it gradually changes and eventually the readings of every month were positive in the year 2020.
b) Northern Hemisphere has the highest surface temperature change compared to the other hemispheres (reference year 2020).

Visualization Description:

Marks: **Lines**
Channels: **Horizontal lengths and Vertical Positions, Colours**
Chart Type: **Diverging Bar Chart**

X-Axis: Temperature Anomaly Readings
Y-axis: Months spanning from January to December.

Columns used: year, Hemisphere, Columns from Jan to Dec

Can change the hemisphere using the hemisphere dropdown.
Can change the year using the year dropdown.

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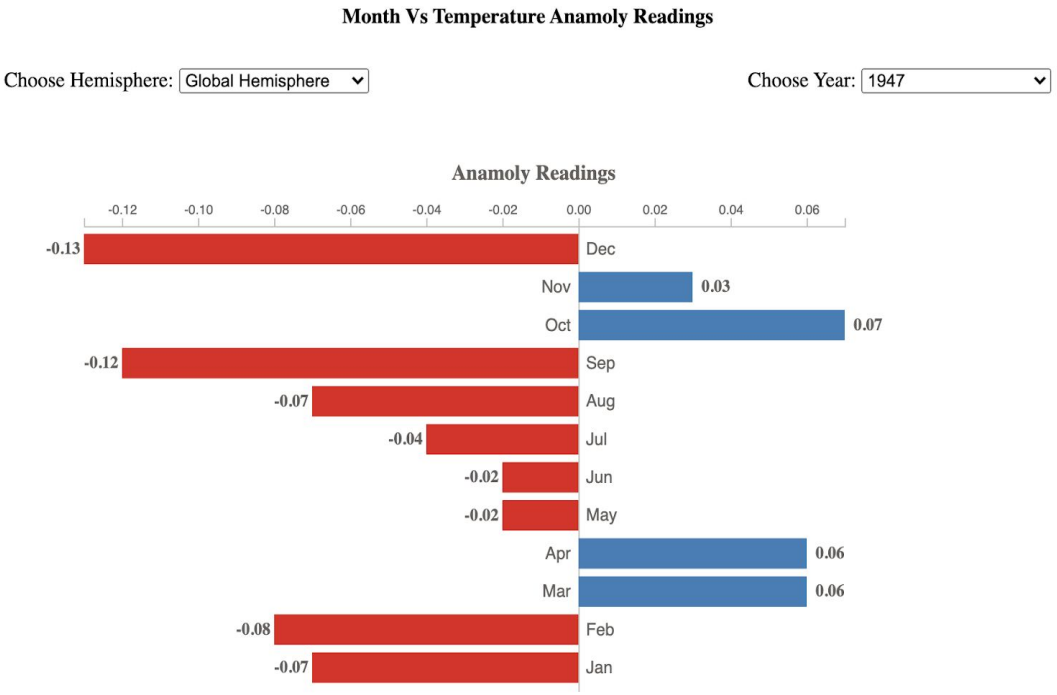

Visualization 2 : Year Vs Monthly Mean Average Temperature Anamoly Readings

Queries Answered :

a) **Any trend in the monthly mean average temperature anamoly readings from the year 1880 to 2020?**
b) **What is the monthly mean average temperature anomaly reading of the given year ?**

Insights Found :

a) There is an increasing trend in the monthly mean average temperature anomaly readings from the year 1880 to 2020 in all the three hemispheres.
b) Northern Hemishpere has recorded the high monthly mean average temperature anomaly readings compared to the other hemispheres.

Visualization Description:

Marks: **Lines, Points**
Channels: **Horizontal and Vertical Positions, Colours**
Chart Type: **Line Chart**

X-Axis: Year
Y-axis: Monthly Mean Average Temperature Anomaly Readings
***Each Hemisphere has been given different colours**

Columns used: year, Hemisphere, J-D

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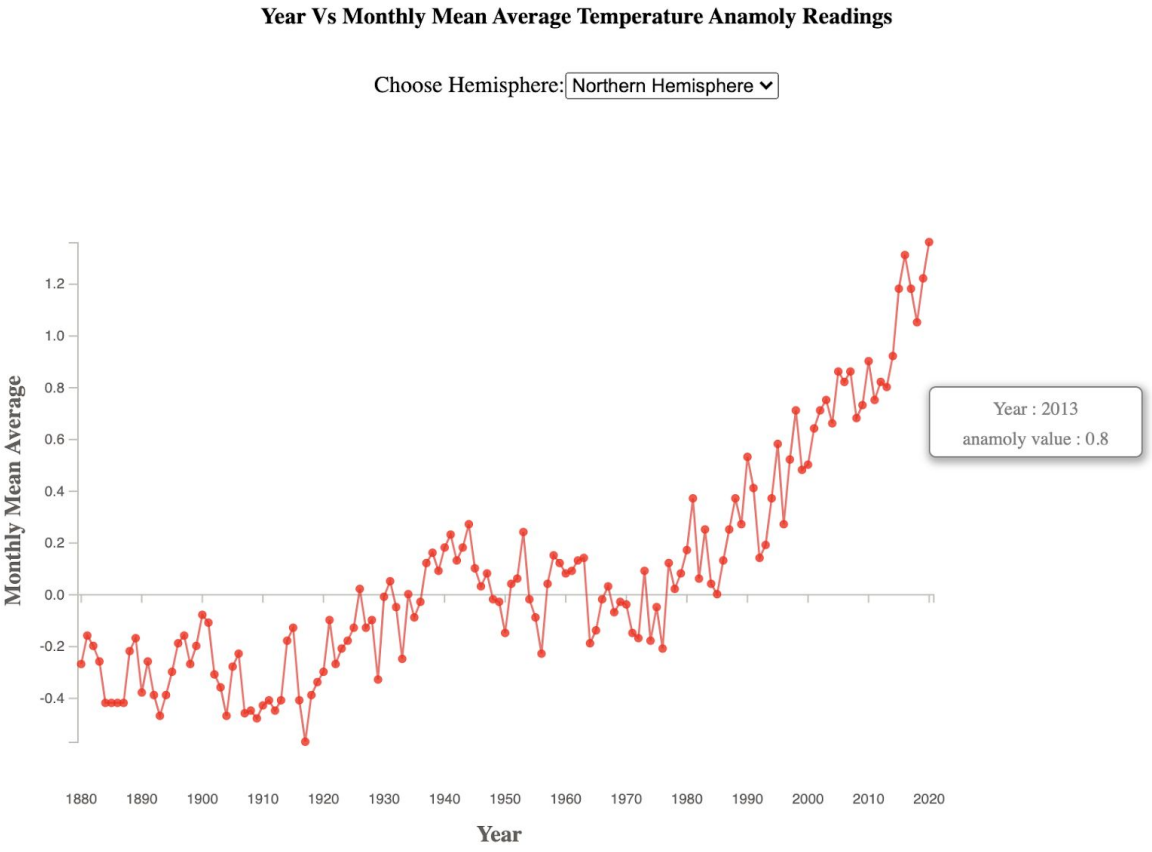
Can change the hemisphere using the hemisphere dropdown.
Hovering on dots shows the exact anomaly value in the particular year.



Visualization 3 : Hemisphere Vs Seasonal Average Temperature Anomaly

Queries Answered :

a) **Which hemisphere has more / less average temperature anomaly for a given season ?**
b) **What is the average temperature anomaly value for a given hemisphere and given season from the year 1880 to 2020 ?**

Insights Found :

a) Northern hemisphere has the highest temperature anomaly for all the seasons.
b) In Autumn season northern hemisphere has recorded its highest temperature anomaly.
c) Souther hemisphere has the lowest temperature anomaly for all the seasons.

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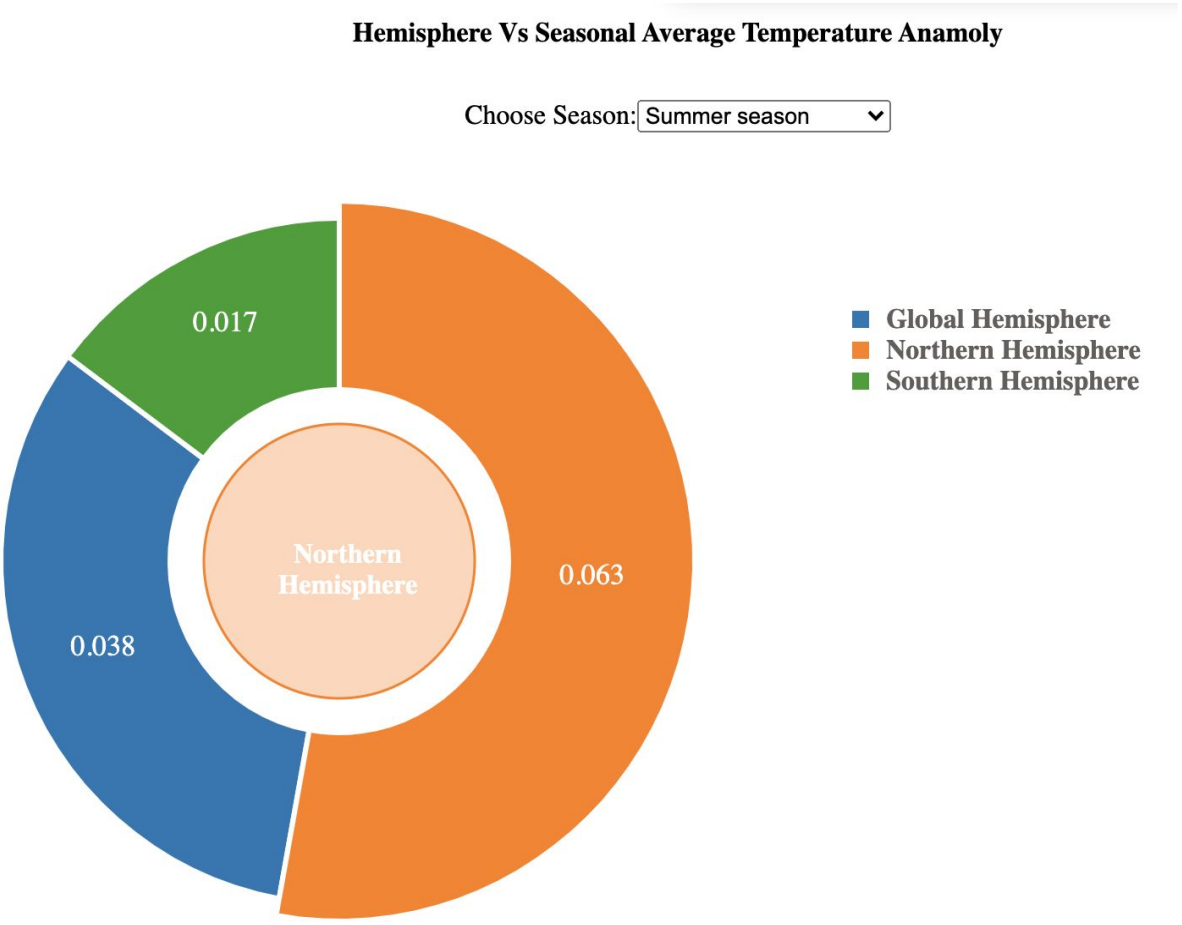
Visualization Description:

Marks: **Points**
Channels: **Colours and Area**
Chart Type: **Donut Chart**

Columns used: DJF, MAM, JJA, SON, Hemisphere

The categorical variable hemisphere forms arcs in the donut chart based on the one of numerical variable DJF, MAM, JJA, SON value at given moment.

DropDown is available to switch among the 4 seasons.



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Visualization 4 : Earth Temperature Anamoly By Hemisphere

Queries Answered :

a) **Show all the temperature anomaly readings gathered for a specific year?**

Visualization Description:

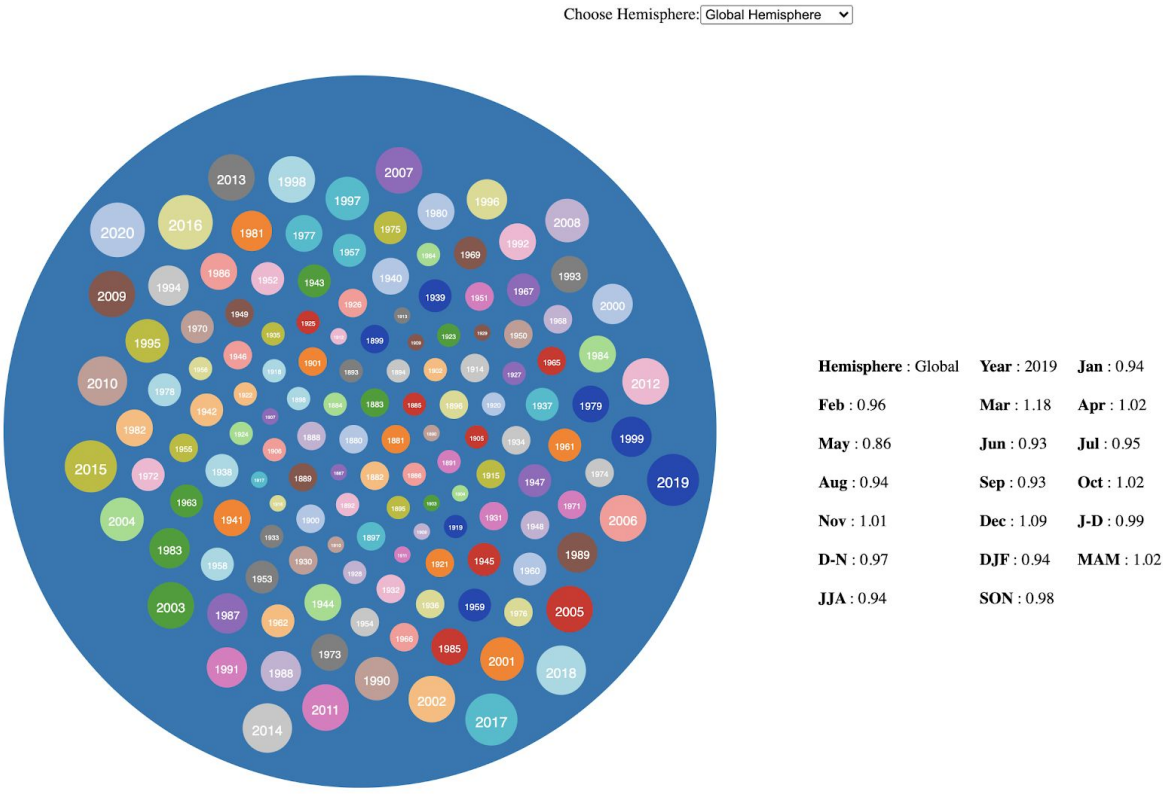
Marks: **Points**
Channels: **Area**
Chart Type: **Bubble Chart**

The area of the circle occupied by each year depends on the normalized monthly mean average temperature anomaly readings(numerical variable).

Columns used: all columns

***(Color has been added to the chart just for the purpose of aesthetic sense)**

Hovering on each Circle shows all the data collected for that specific year.
Can change the hemisphere using the hemisphere dropdown.



Hemisphere : Global	**Year** : 2019	**Jan** : 0.94
Feb : 0.96	**Mar** : 1.18	**Apr** : 1.02
May : 0.86	**Jun** : 0.93	**Jul** : 0.95
Aug : 0.94	**Sep** : 0.93	**Oct** : 1.02
Nov : 1.01	**Dec** : 1.09	**J-D** : 0.99
D-N : 0.97	**DJF** : 0.94	**MAM** : 1.02
JJA : 0.94	**SON** : 0.98	

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Steps To Run the Source code :

1) **Start the http server inside the directory EarthTemp.**

   http-server --cors (port 8080)

2) **Open submission.html file inside the directory directory EarthTemp in the browser.**