

# **B1 - Submission 1**

D3 Visualization

Global Temperature

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Link: <https://huangxuankun.github.io/D3-Global-Temperature-Trend-Visualization/>

# Dataset

The original dataset are used.

## Dataset Pre-processing

Pre-processing with python script is performed to:

- Extract seasonal data with regards to Global, Northern and Southern Hemisphere.
- Extract annual data of the year from Jan to Dec with regards to Global, Northern and Southern

The processing script source code can be viewed: [Code](#)

### Processed Dataset 1 (CSV): Annual Temperature By Hemispheres

Consists of 360 rows and 3 columns

Column	Data type	Range	Unit	Description
Year	Year	1900 - 2020	Year	
Hemisphere	String	Global, Northern, Southern	Null	The hemispheres where temperature is collected from
AnnualAvg	Float (2 dec)	-0.57 - 1.36	Degree	The average temperature of the year from Jan to Dec

### Processed Dataset 2 (CSV): Seasonal Average Temperature By Hemispheres

Consists of 360 rows and 3 columns

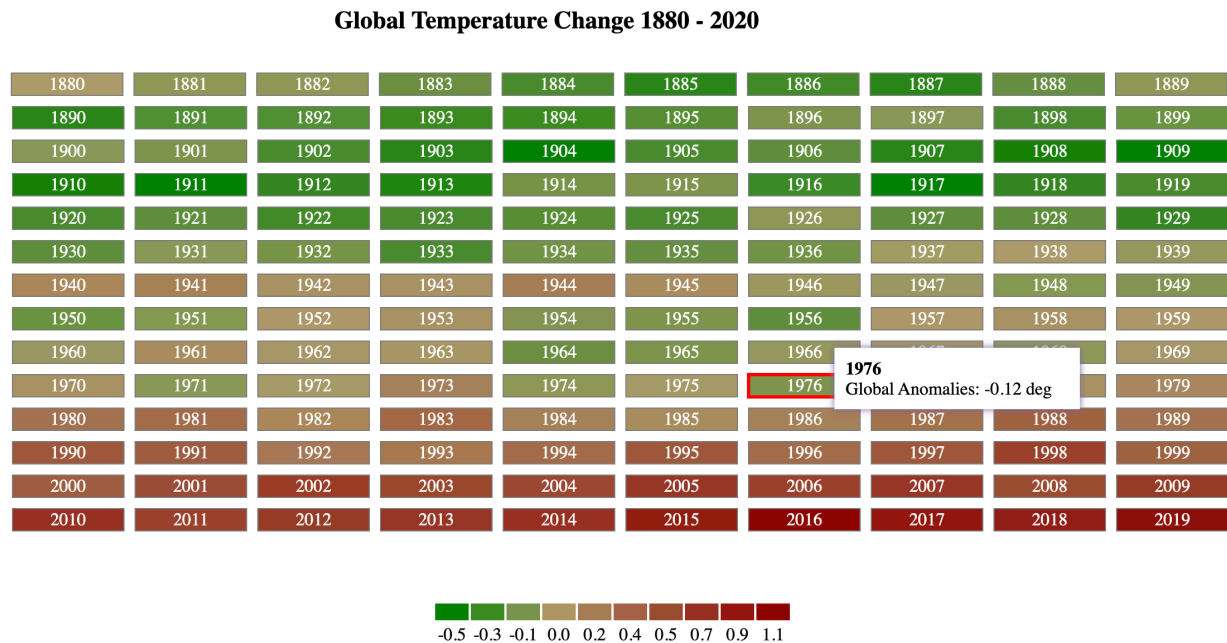
Column	Data type	Range	Unit	Description
Year	Year	1900 - 2020	Year	
Hemisphere	String	Global, Northern, Southern	Null	The hemispheres where temperature is collected from
SeasonAvg	Float (2 dec)	-0.78 - 1.68	Degree	The average temperature of the year from current season
Season	String	Winter, Spring, Summer, Autumn	Null	Winter: Dec to Feb, Spring: Mar to May, Summer: Jun to Aug, Autumn: Spet to Nov

# Objective

1. Using interactive visualisation to show the trending of global temperature anomalies since 1880.
2. Focus on temperature change in recent years to explore how modernisation affects global temperature.
3. Explore insight by comparing temperature anomalies variation between
  - seasons (Winter, Spring, Summer, Autumn)
  - Hemispheres (Northern, Southern)

# Query 1: Show global annual temperature anomalies from 1880- 2020

Link: [https://huangxuankun.github.io/D3-Global-Temperature-Trend-Visualization/DataViz\\_1/Part2/](https://huangxuankun.github.io/D3-Global-Temperature-Trend-Visualization/DataViz_1/Part2/)



## Interactivity:

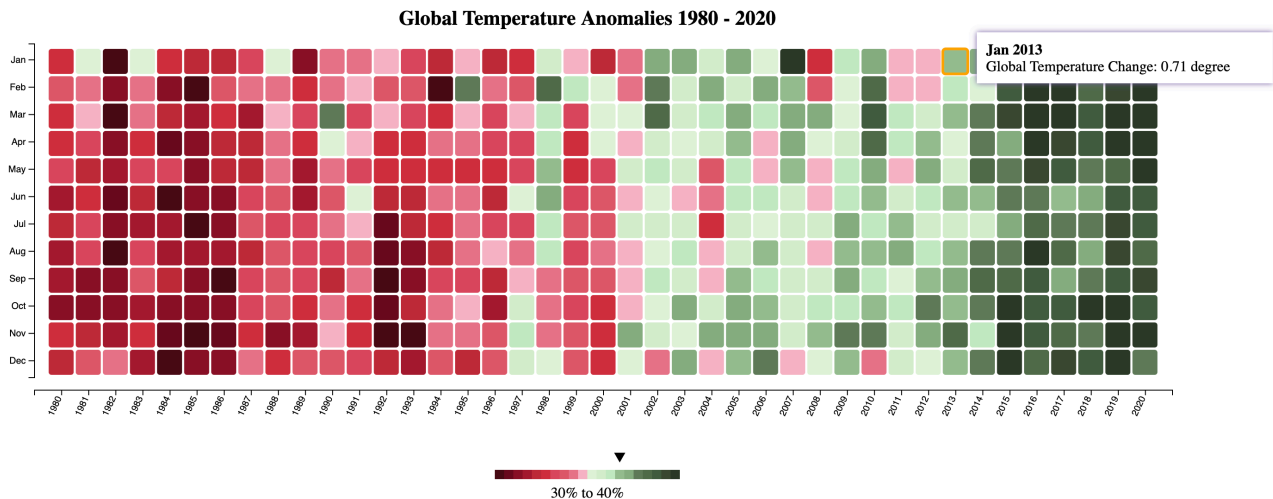
- Tooltip on hover to show the temperature anomalies with year

## Insight:

- From 1880 to 1920, the increases of anomalies is negligible. It is worth notice that from 1890 to 1910, the anomalies is even decreasing.
- However, since 1920, the anomalies increases with higher gradient.
- From 1930 to 2020, the anomalies increases from about **0** to **1.1** degree, implying the severe global warming during the era of entering modernisation.

## Query 2: Focus on visualising global **monthly** temperature anomalies from 1880 - 2020

Link: [https://huangxuankun.github.io/D3-Global-Temperature-Trend-Visualization/DataViz\\_1/Part1/](https://huangxuankun.github.io/D3-Global-Temperature-Trend-Visualization/DataViz_1/Part1/)



### Interactivity:

- Tooltip on hover to show the temperature anomalies with year
- Use color legend to show the **temperature percentage change of selected month** compare to mean temperature anomalies

### Insight:

- The anomalies **increase rapidly** since 1980 to 2000, with increases of about **0.2 to 0.5**
- The anomalies increases slower down in from 2001 to 2013, with increases of about **0.6 to 0.7**
- After 2010, the anomalies increases with a higher gradient, such that as of 2020, it increases from about **0.7 to 1.1**

# Query 3: Visualises annual temperature anomalies with respect to **seasons** and **hemispheres**.

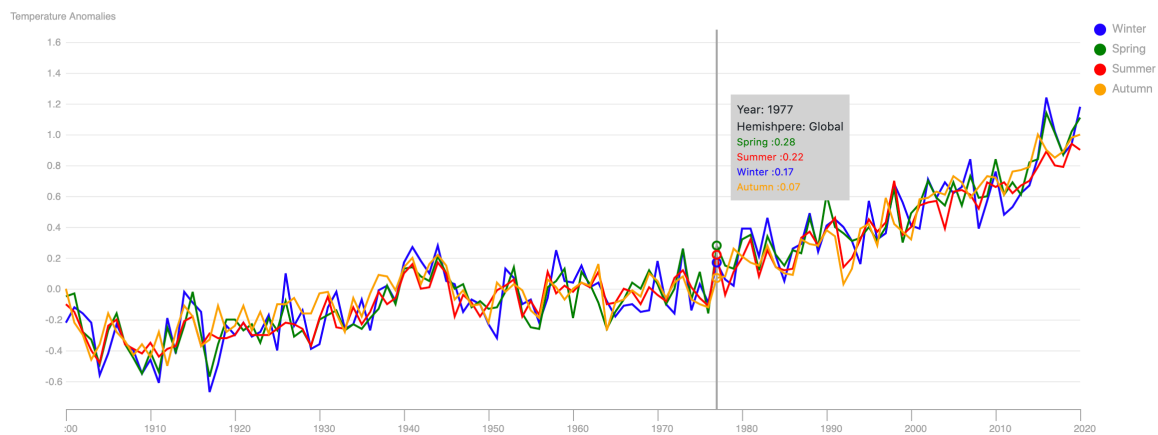
Link: [https://huangxuankun.github.io/D3-Global-Temperature-Trend-Visualization/DataViz\\_1/Part3/](https://huangxuankun.github.io/D3-Global-Temperature-Trend-Visualization/DataViz_1/Part3/)

## Seasonal Average Temperature Anomalies 1900 - 2020

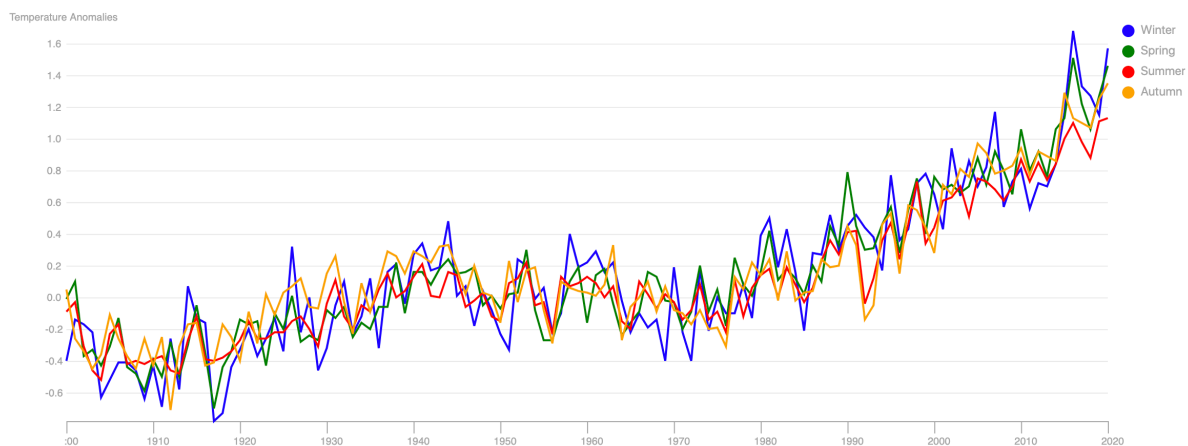
Temperature Anomalies average computed from Jan to Dec of the year

Northern = half that lies north of the Equator. Southern = half that lies south of the Equator

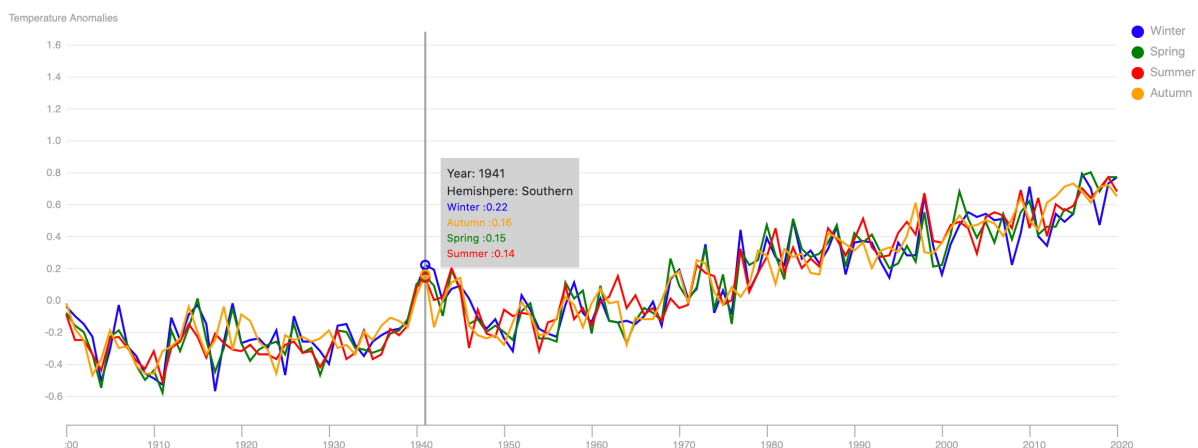
☒ Global ☐ Northern ☐ Southern



☐ Global ☒ Northern ☐ Southern



☐ Global ☐ Northern ☒ Southern



## Interactivity & Animation:

- On hover show tooltips with seasonal temperature anomalies
- Switching between Global, Northern and Southern Hemispheres with animation

## Insight:

Insight 1: Northern hemisphere has **higher temperature anomalies** than southern hemisphere

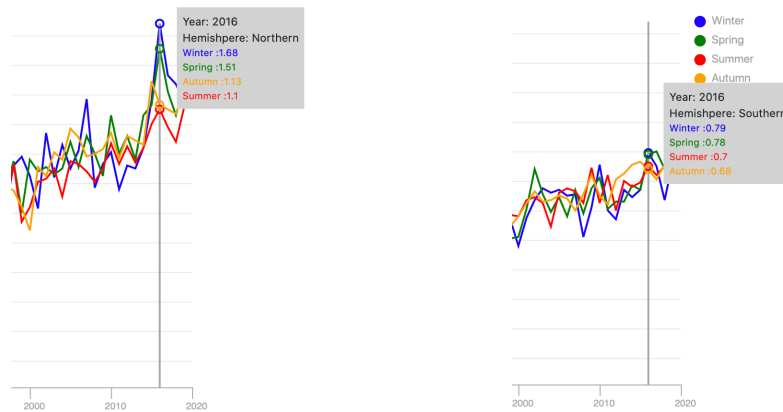


Figure 3.1: Northern hemisphere vs Southern hemisphere

Insight 2: Northern hemisphere has **higher seasonal anomalies variation**.

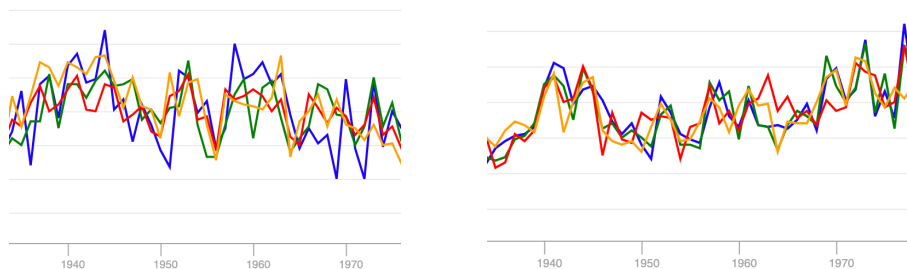


Figure 3.2: Northern hemisphere vs Southern hemisphere

Insight 3: Southern hemisphere has **closer seasonal anomalies trending** than Northern hemisphere

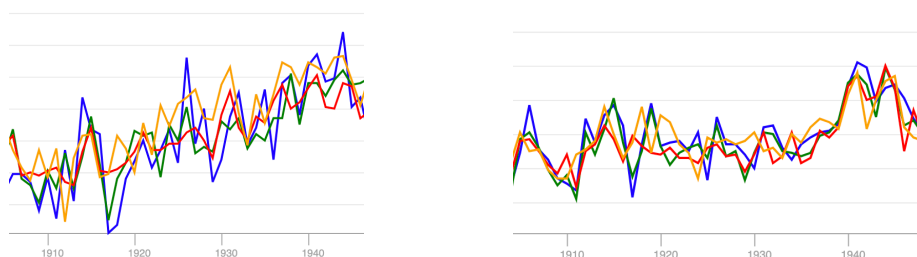


Figure 3.3: Northern hemisphere vs Southern hemisphere

## Query 4: Compare annual temperature anomalies with between hemispheres.

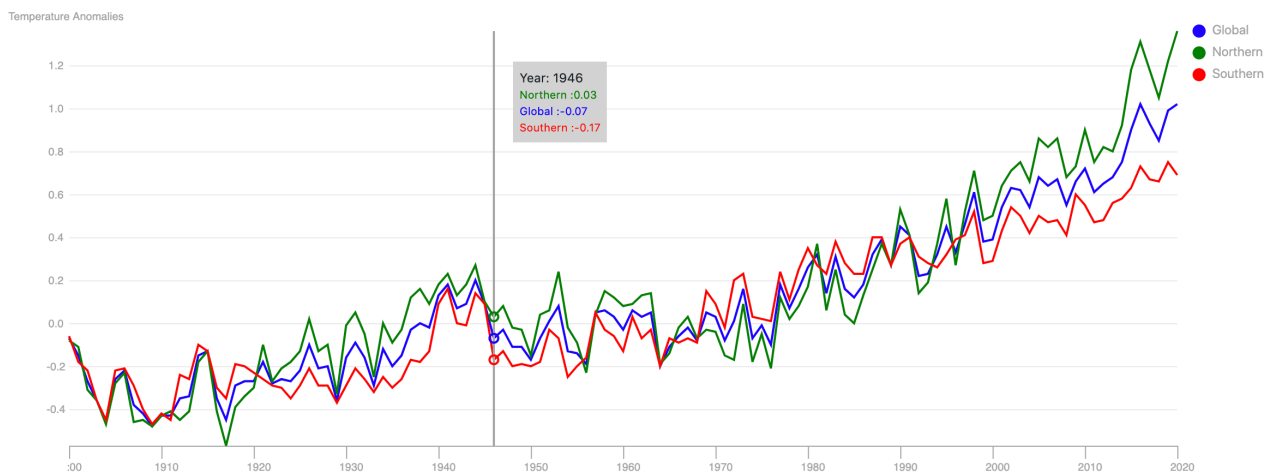
Link: [https://huangxuankun.github.io/D3-Global-Temperature-Trend-Visualization/DataViz\\_1/Part4/](https://huangxuankun.github.io/D3-Global-Temperature-Trend-Visualization/DataViz_1/Part4/)

### Annual Average Temperature Anomalies 1900 - 2020

Temperature Anomalies average computed from Jan to Dec of the year

Northern = half that lies north of the Equator.

Southern = half that lies south of the Equator



## Purpose

In previous query, we have observe the variation between hemispheres. By using annual anomalies instead of seasonal anomalies, the difference between hemispheres can be spotted easily.

## Interaction

Tooltip of detail is displayed upon mouse hover

## Insight:

Insight 1: Northern hemisphere has higher temperature anomalies

Insight 2: Before 1915, there is no obvious variation of anomalies between northern and southern hemispheres

Insight 3: After 1915, the variation of temperature anomalies between northern and southern hemispheres is increasing over year