RAIN & SHINE

## IS428 Visual Analytics for Business Intelligence

# Identify in-depth insights and trends of the Climate in Singapore with Interactive Visualisations

## PROBLEM & MOTIVATION

The reporting of Singapore's climate has always been **primitive,** hence, it is **challenging for users to derive in-depth insights.** In 2019, multiple news companies reported that Singapore is heating up twice as fast as the rest of the world and Professor Matthias Roth from the department of geography at National University of Singapore attributed the rising temperatures to global warming and the Urban Heat Island effect. However, **no data or charts were provided** from them to back up their claims on Singapore's climate change.

Our team aims to present Singapore's climate data in a more user-friendly and meaningful interpretation way. Through Rain&Shine, an interactive and user-friendly visualization dashboard that shows the distribution of the climate by Subzone, Region, and the whole Singapore, we hope to provide Singaporeans with knowledge and in-depth insights to Singapore's climate. Additionally, we want to identify the trends inherent within the weather data available and answer questions regarding the changes in Singapore's climate from available historical data.

## OBJECTIVES

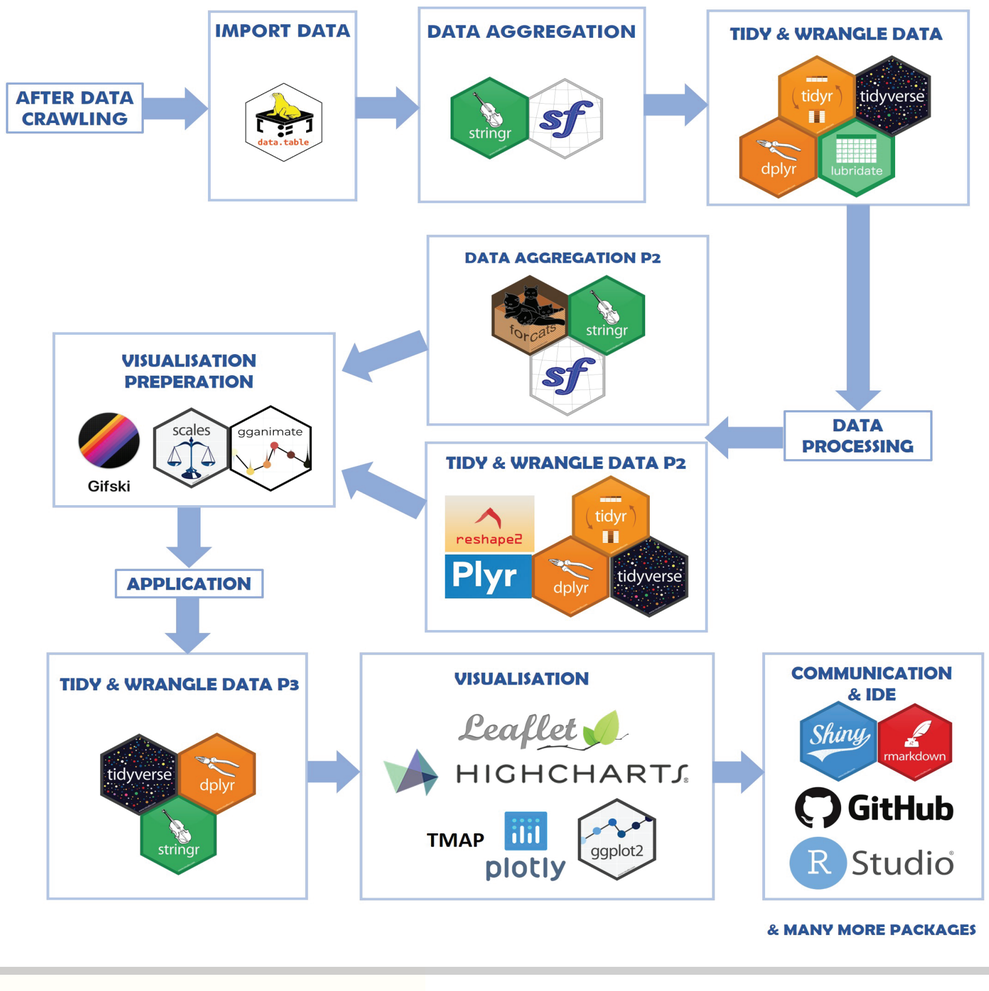
### Target Group:

General Public, people living in Singapore, and weather enthusiast.

We aim to provide an interactive visualization dashboard to assist General Public, people living in Singapore with understanding the weather of our country with visualization information such as:

1. Insights on the Rainfall Precipitation of the whole of Singapore and each subzone with rainfall station from 1990 to 2019.
2. Insights on the Temperature of the whole of Singapore and each subzone with temperature station from 1990 to 2019.
3. Insights on the relationship of the Rainfall Precipitation and Temperature in the different months yearly.

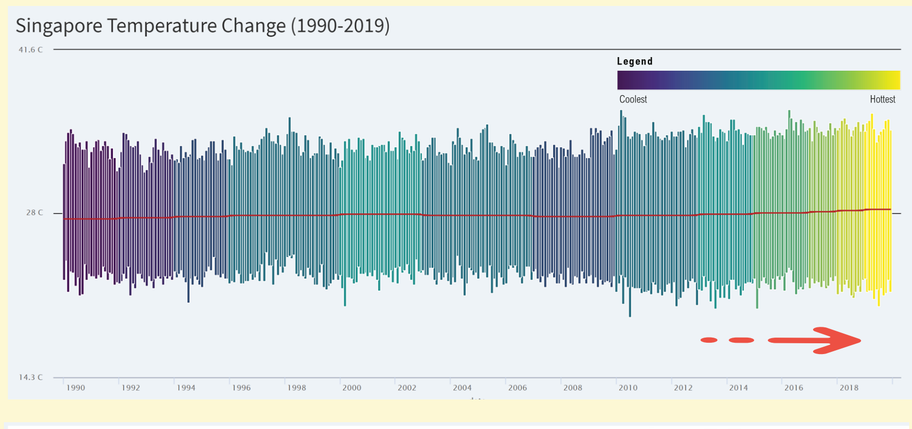
## TOOLS & TECHNOLOGY USED




## KEY FINDINGS

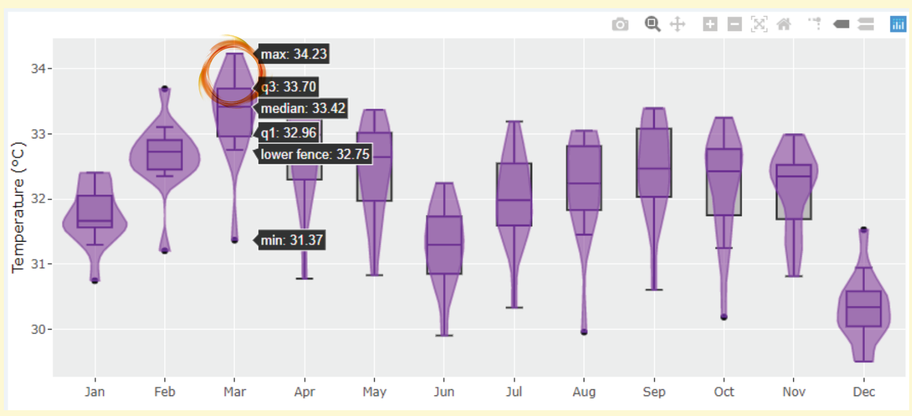
1

Singapore's temperature is gradually turning warmer in the recent 10 years.
The trendline is gradually increaing and the colors are slowly turning from **purple** to **yellow** since 2010.



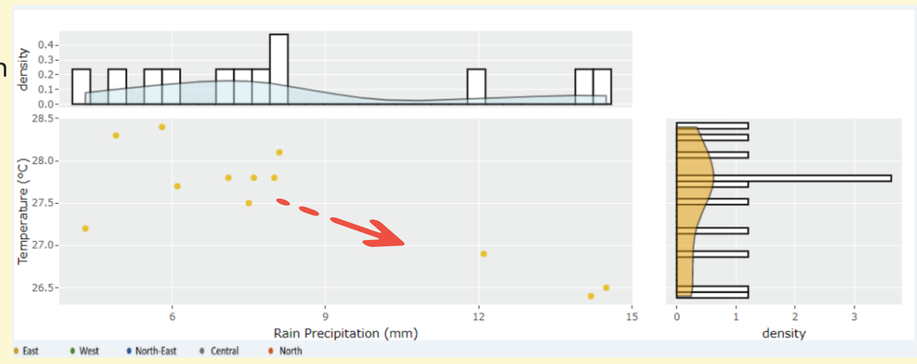

2

In year 2009 to 2018, the maximum temperature has never hit 34°c, however in 2019, the maximum temperature was above 34°c.
Filters: Measurement = Maximum Temperature, Year = 2019



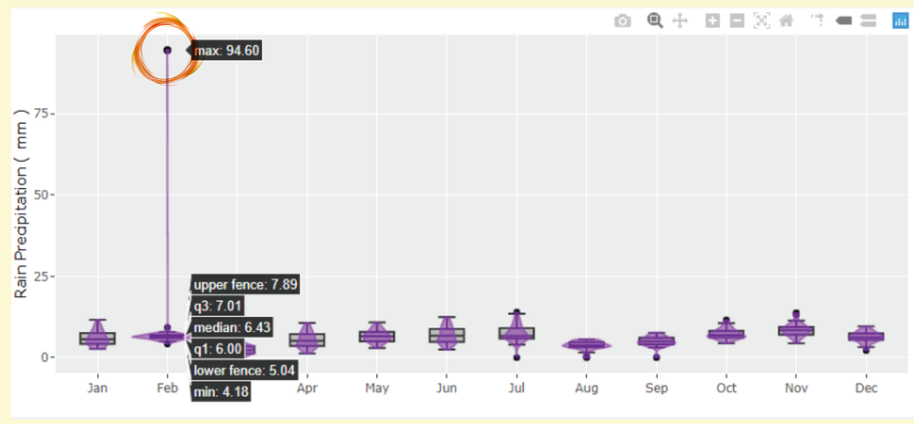

3

Trend: As the rain precipitation (mm) amount increases in the month, the temperature in the month is likely to decreases.
Filter: Year = 2017, Region = All




4

Anomaly: On average, the maximum total daily rain precipitation (mm) is around 30mm, however in 2016 Feb, the daily rainfall hit 94.6mm. Filter: Measurement = Total Daily Rainfall, Year = 2009




## FUTURE WORK

### Isopleth Map

Since our current weather map is represented in a choropleth map, through further research, our team plans to transfer the data to be displayed in an isopleth map.

### Informative Pages

Our team would add more fun fact pages in our dashboard to inform users the rainiest, coldest and warmest day for each region in Singapore.

### Temperature Differences Chart

Research on the best way to plot a chart that shows the fluctuations and the changes in the rate of the temperature from 1990 till date.

## APPROACHES

### Idea Generation

Research and identify existing problems that Singapore is facing, we came across the article on Singapore heating up twice as fast as the world but with no substantial evidence. We decided to address the issue.

### Data Crawling, Preperation, Exploration

Crawl all available data from Weather.gov.sg with R, compiled all files from the crawled data into 1 file, combined individual year, month, day into a date column, removed filtered rows N.A values.

### Plan Visualisation

Explore the Weather.gov.sg for data and charts. Understand the charts presented and improve from their lackings through research.

### Implementation

Leverage on R packages like Leaflets, GGPlot2 Plotly, HighCharts, ShinyApp to display the interactive visualisation dashboard.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SPECIAL THANKS TO:
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