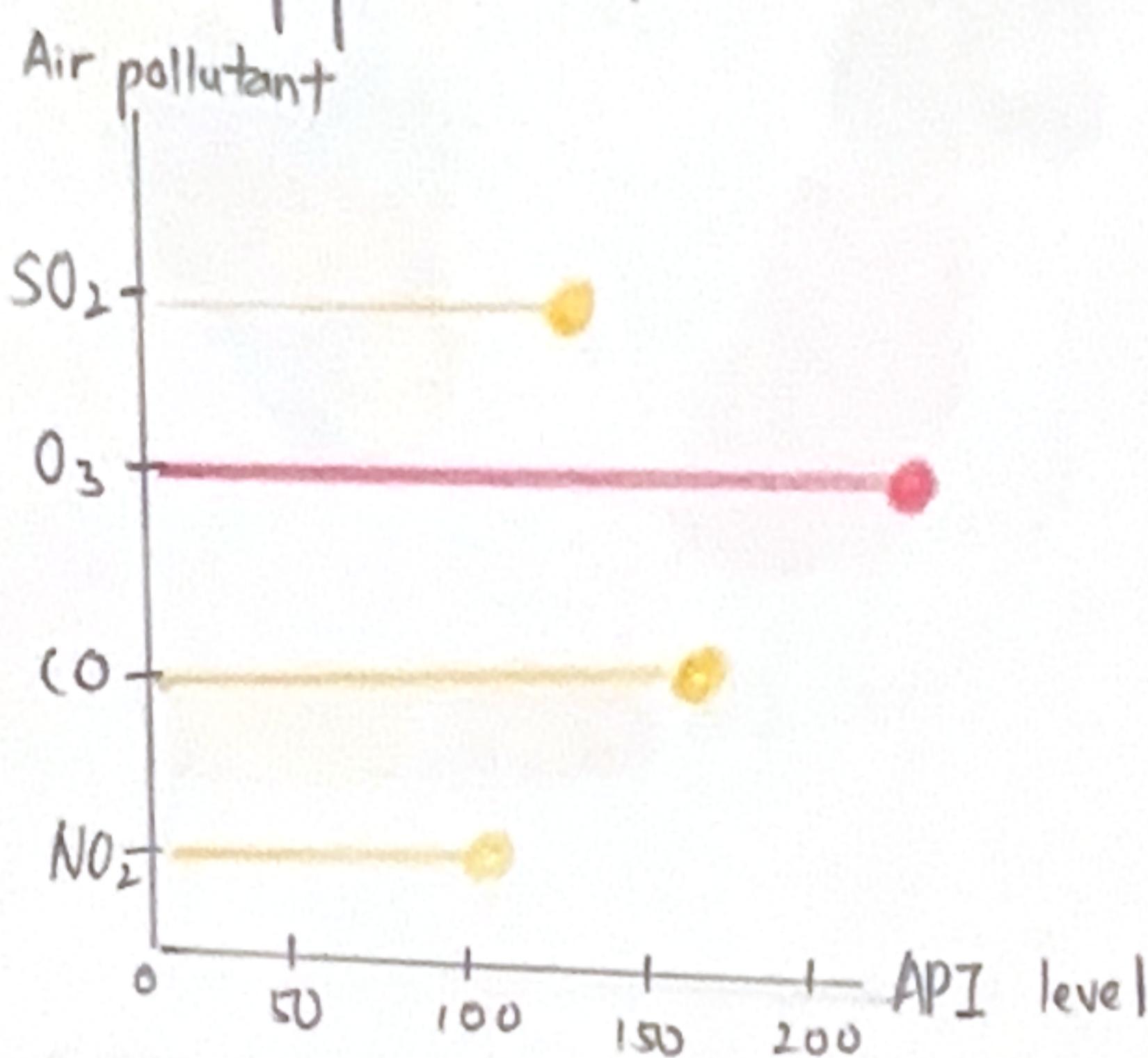


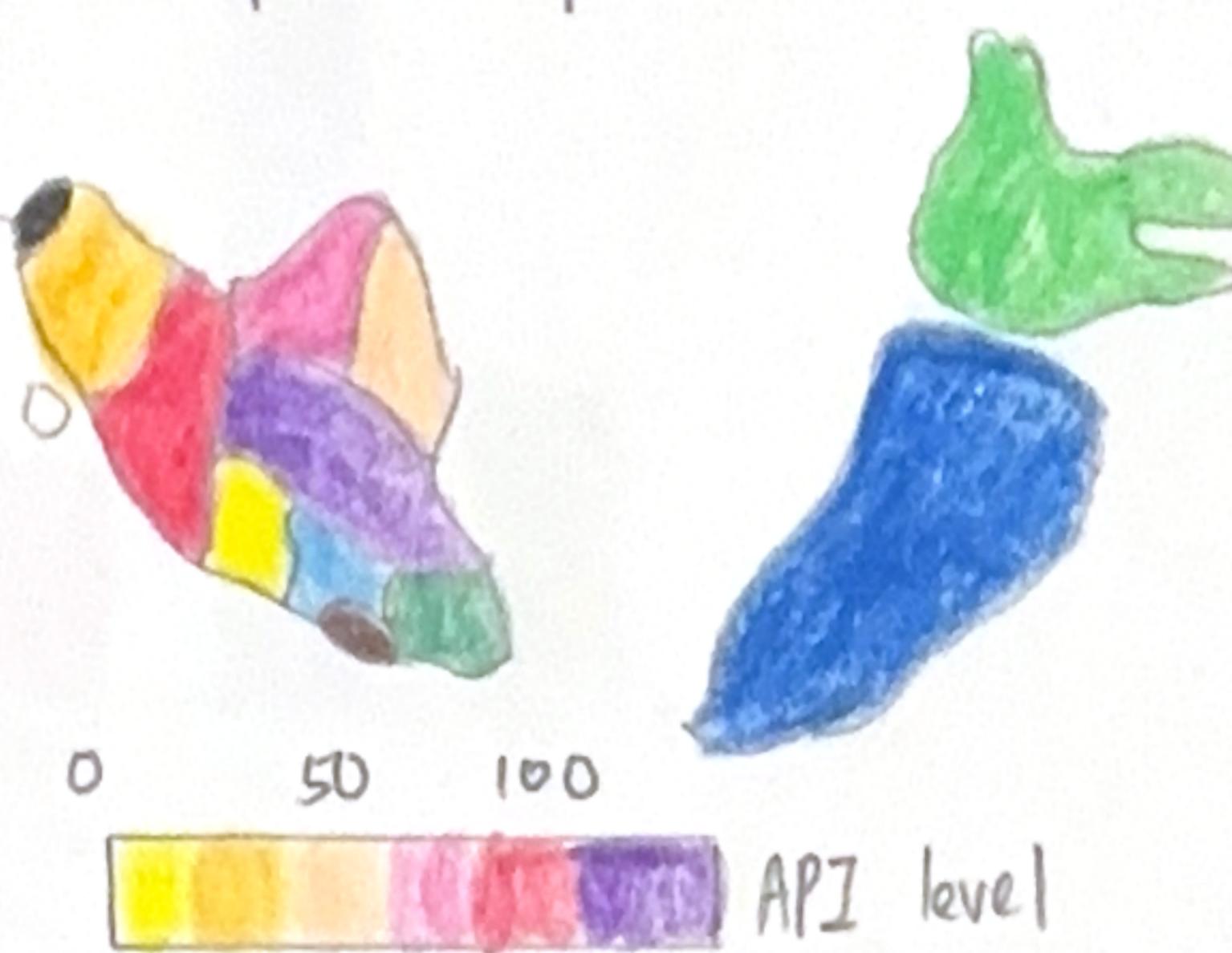
# SHEET 1 : Brainstorm

## 1. Ideas

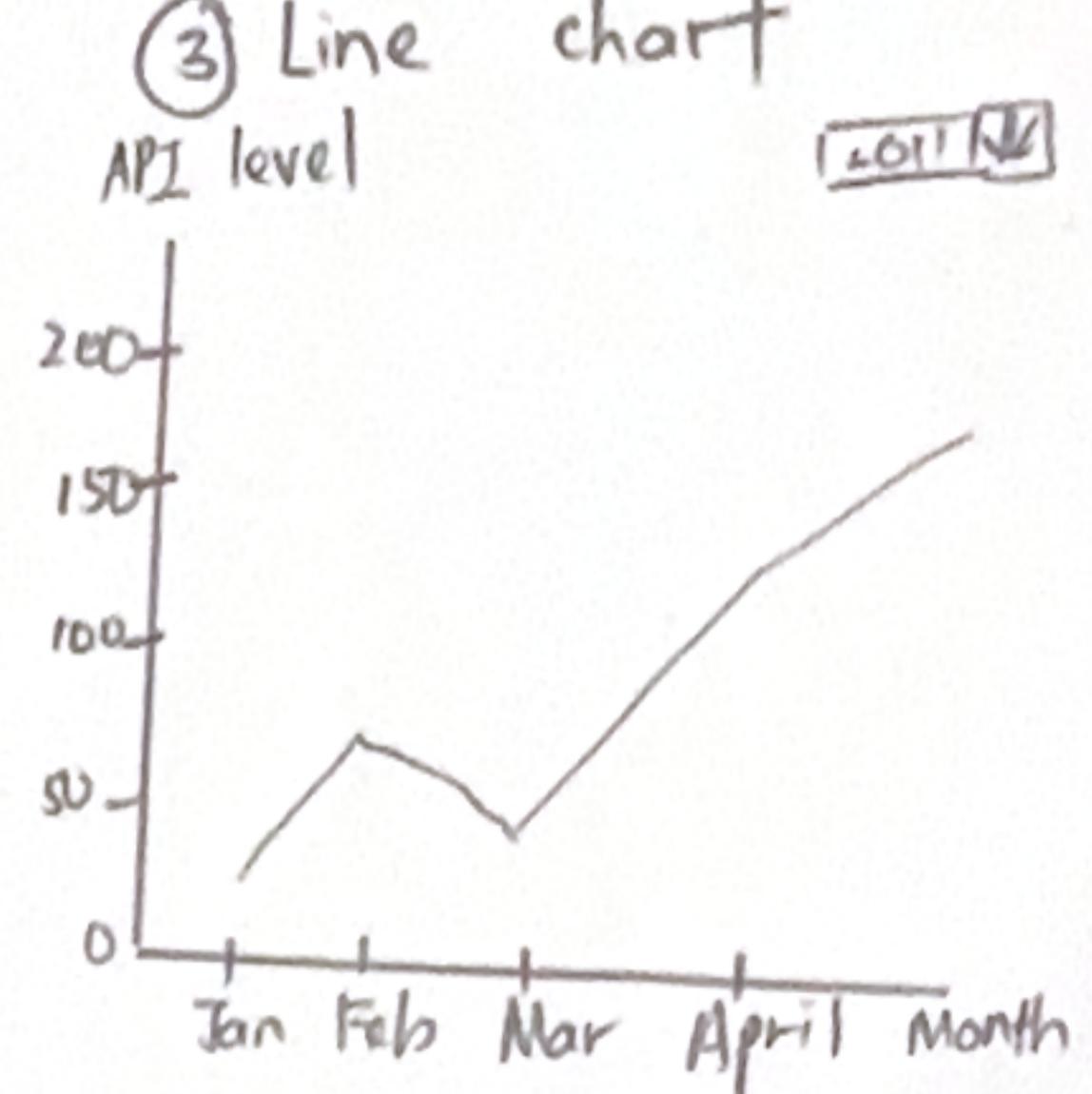
### ① Lollipop chart



### ② Choropleth map



### ③ Line chart



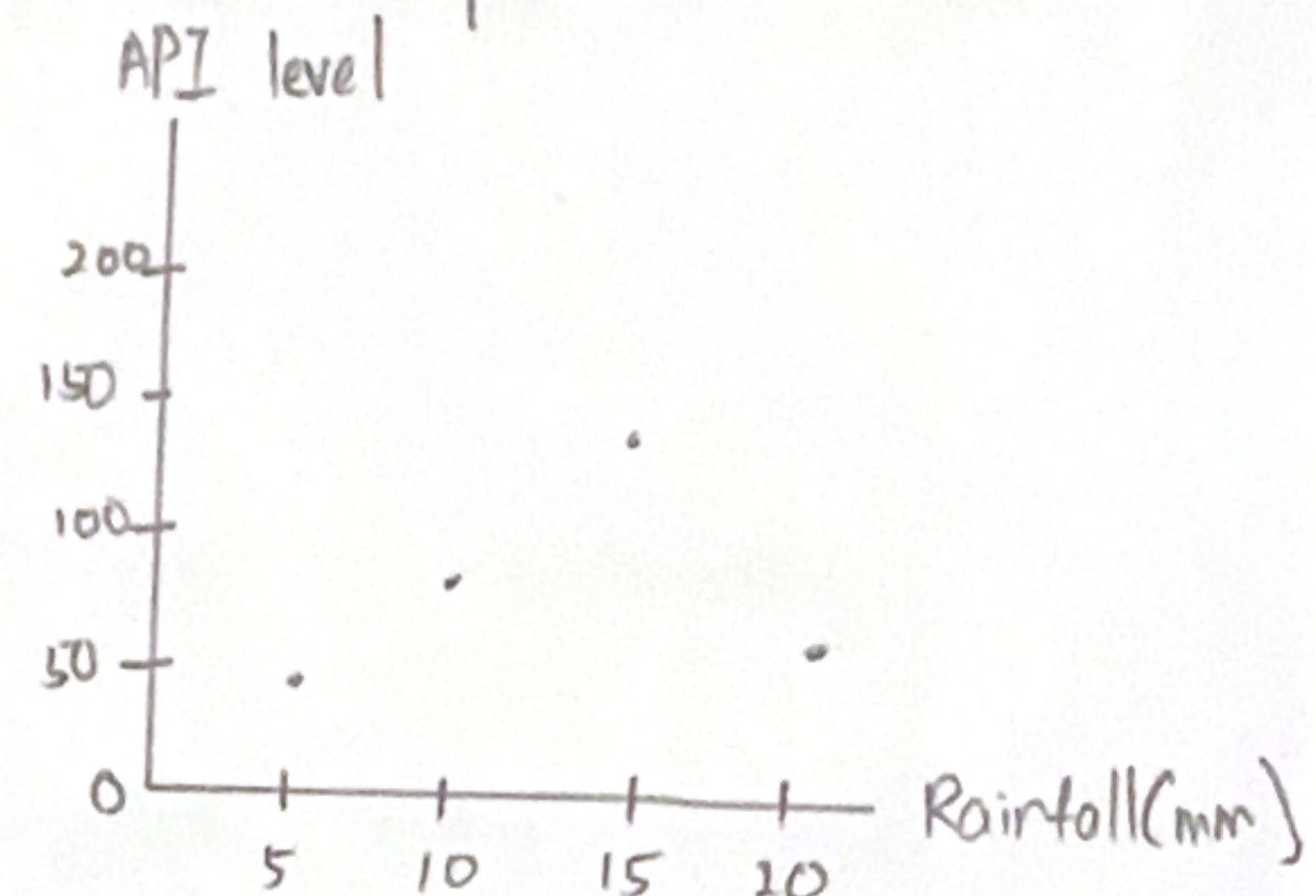
### ④ Heatmap calendar



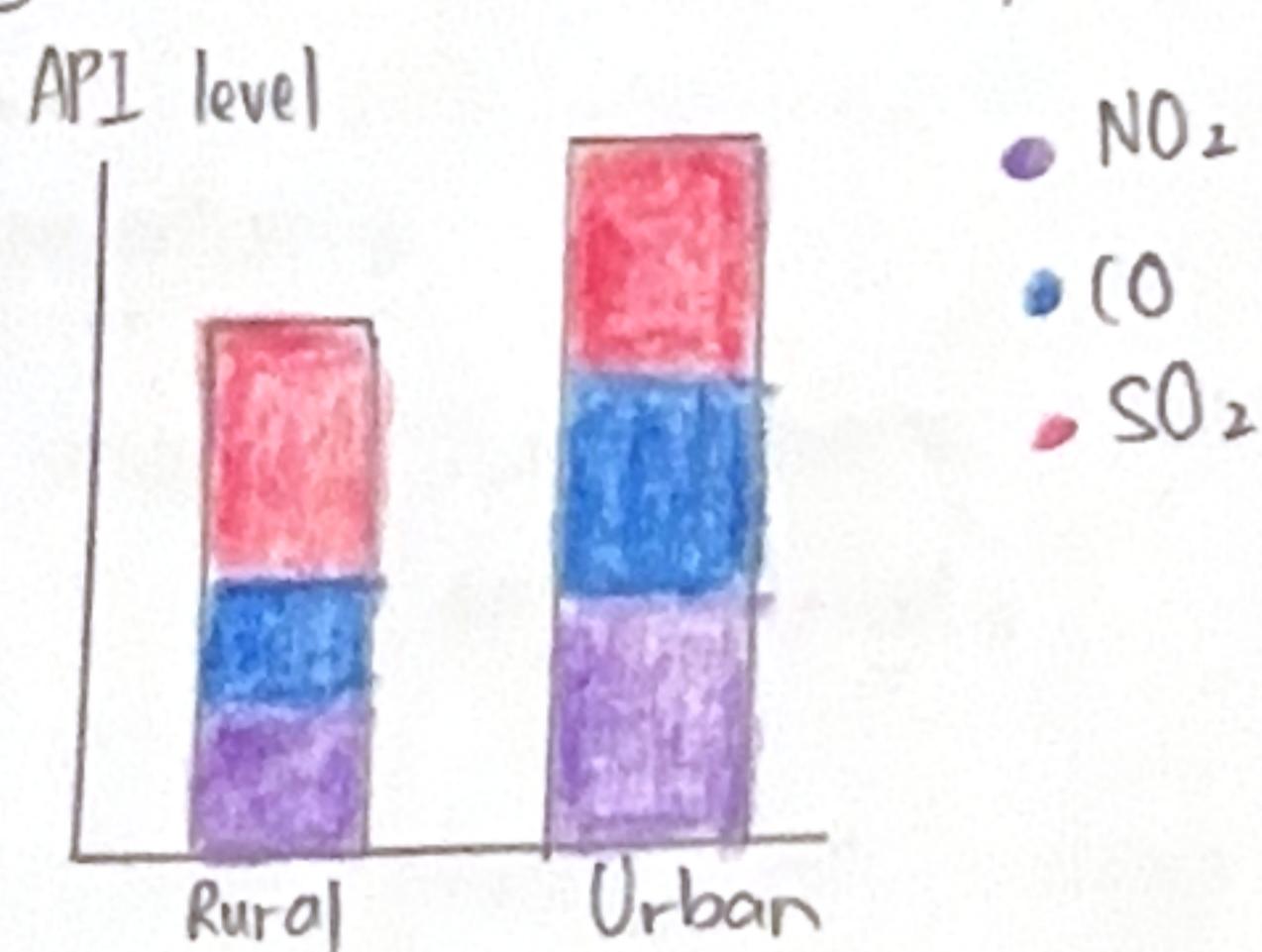
### ⑤ Bar chart



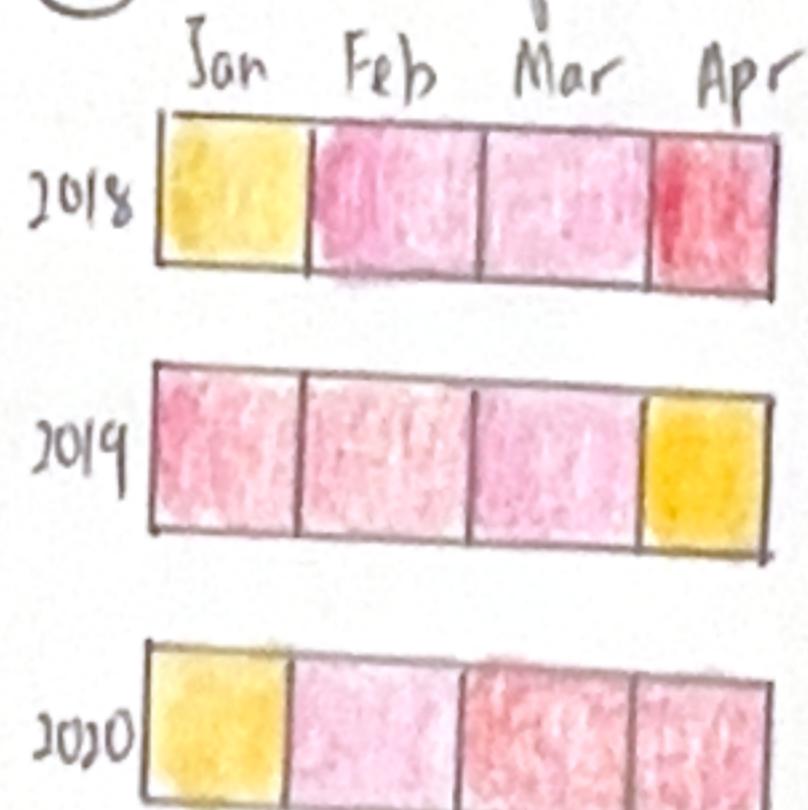
### ⑥ Scatter plot



### ⑦ Stacked bar chart



### ⑧ Heatmap calendar



## 2. Filter

- Heatmap calendar (8) overlaps with line chart, both focus on showing which month in the year has highest API level

## 4. Combine & refine

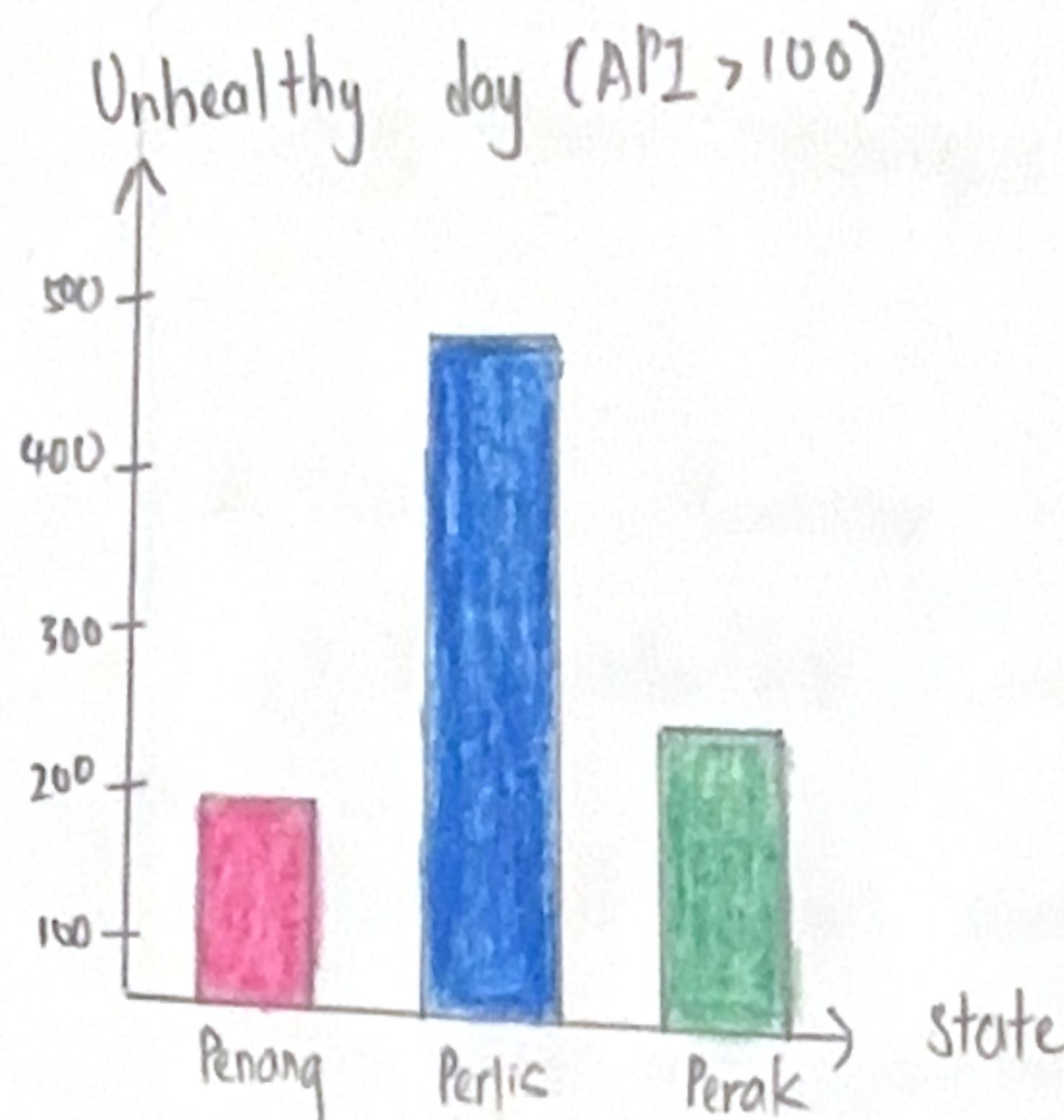
- Combine heatmap calendar (8) into line chart
- Refine final set to 7 unique chart

## 3. Categorise

- i) Air quality by location
  - Choropleth map
  - Bar chart
- ii) Air quality over time
  - Line chart
  - Heatmap calendar
- iii) Air quality vs external factors
  - scatter plot
- iv) Pollutant contributions
  - Stacked bar chart
  - Lollipop chart

## SHEET 2

### Layout



### Focus

1. Choropleth map show which state in Malaysia has the worst air quality. (Colour from light to dark (good, moderate, unhealthy))
2. Each bar represent one state
3. User can see both overall severity and how often air is unhealthy.
4. Novel interaction : clicking a bar (selecting a state) update other charts, enabling exploration of that state's API level

### Operations

- Hover : User hovers over each state in map  $\rightarrow$  tool tips show state name and API details
- Click state on map  $\rightarrow$  highlight in bar chart
- Sort bar chart by unhealthy days

### Discussion

#### Advantages :

- Easy to spot worst states
- Combine spatial + frequency view
- strong overview for quick insights

#### Disadvantages :

- Map might oversimplify (some colour for different distributions)
- Bar chart alone can't show within month variations.

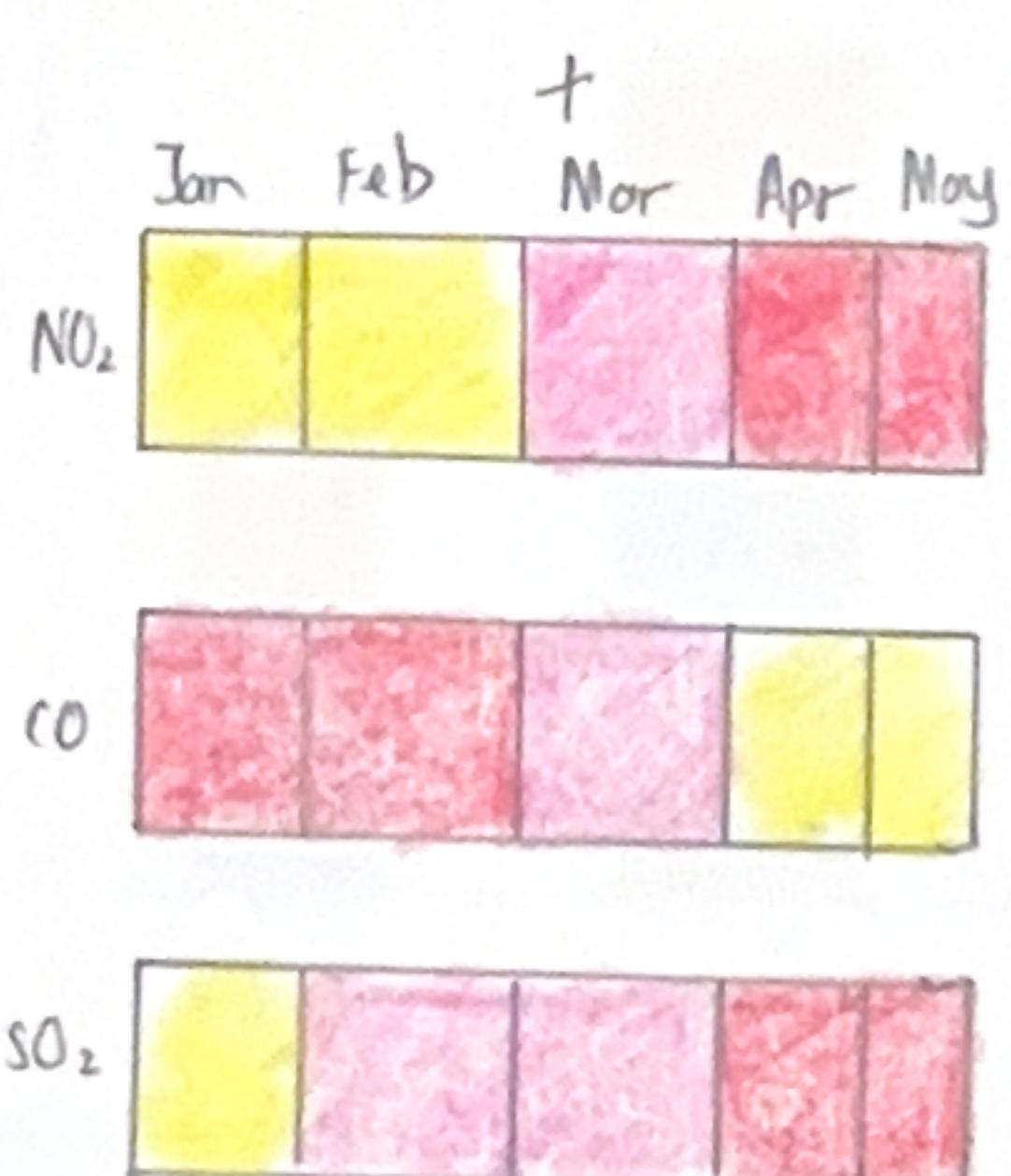
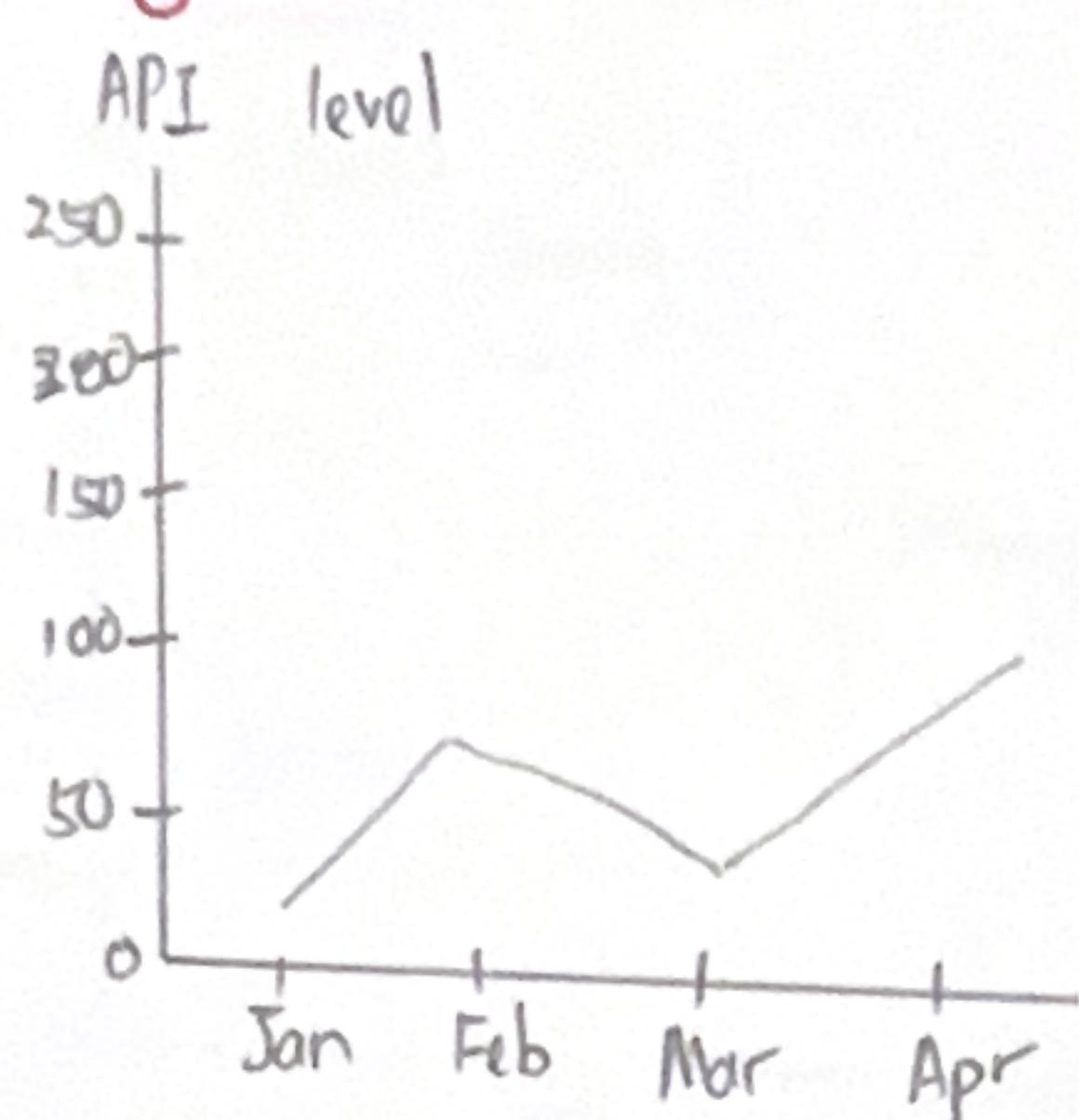
#### Meta information

Title : Air Quality Visualisation - Spatial Overview  
Author : Soh Zhi Tying  
Date : 22/9/2025  
Sheet : 2  
Task : Show where air quality is worst in Malaysia

# SHEET 3

Sh  
Big

## Layout



## Focus

1. Key visual technique: Line chart for trends over time
2. Novelty: Heatmap calendar to link months with pollutant concentration
3. Combined view shows seasonal air quality changes and pollutant drivers.

## Operations

- User can select one or multiple states on the line chart
- User can zoom into specific months on the line chart
- User can filter the heatmap by state: see monthly pollutant concentrations
- User can hover over heatmap cells - view exact values

## Discussion

### Advantages :

- Show seasonal air quality patterns, connects pollutants to API peaks

### Disadvantages :

- Line chart can get cluttered with many states, heatmap requires careful colour scaling

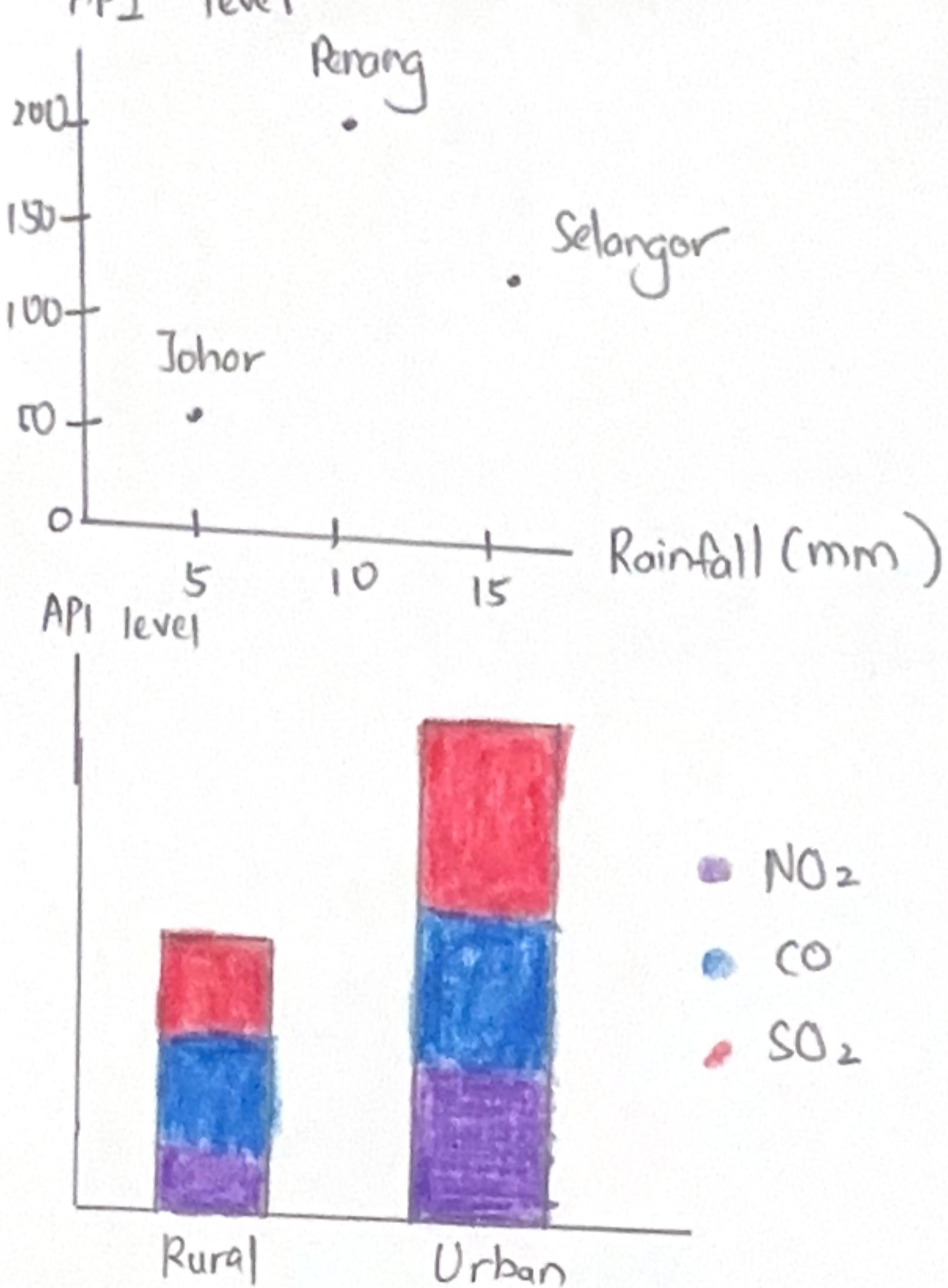
## Meta information

Title : Air Quality visualisation - temporal patterns  
Author : Soh Zhi Tying  
Date : 22/9/2025  
Sheet : 3  
Task : Show when air quality worsens and which pollutants dominate

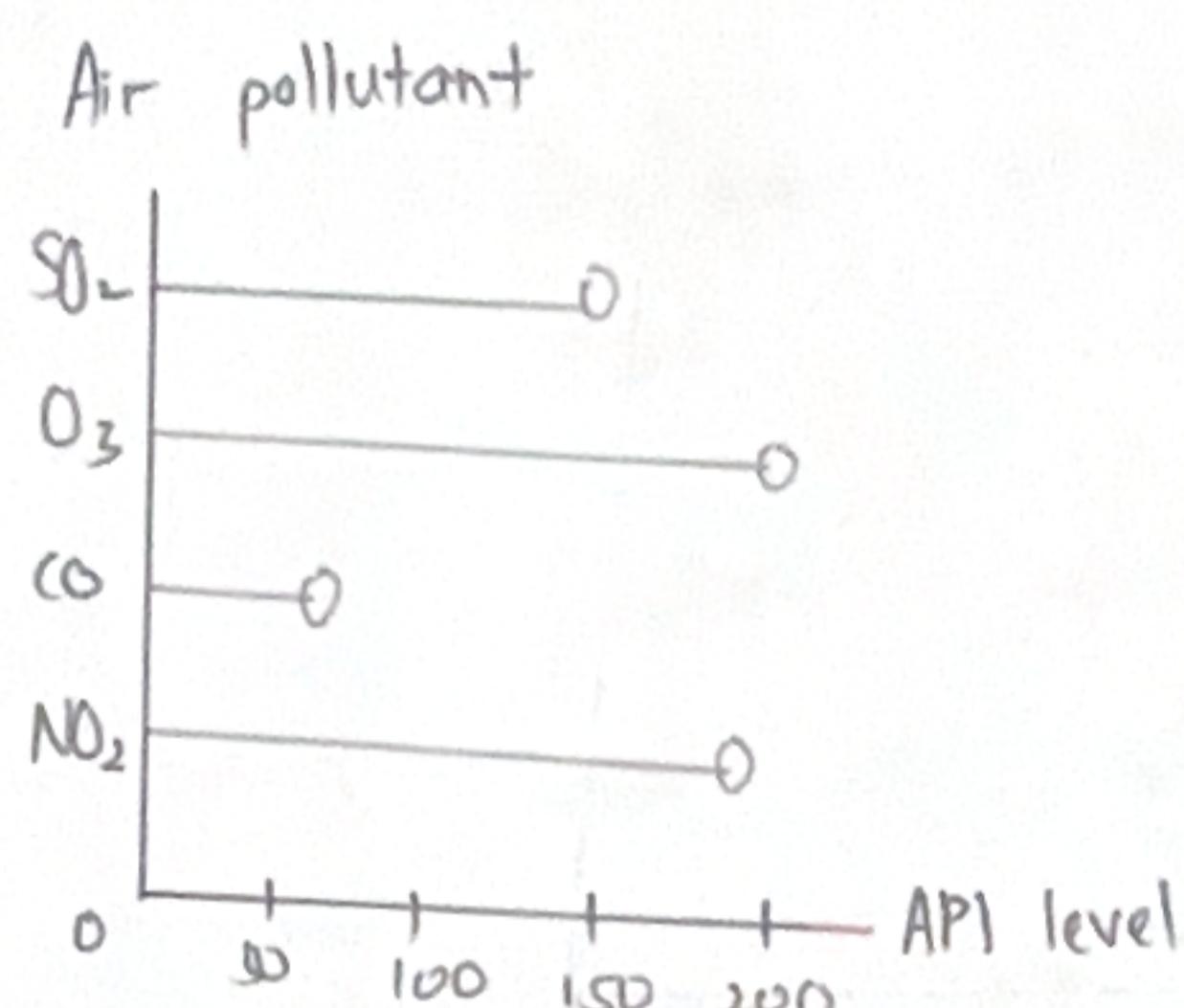
# SHEET 4

## Layout

API level



- NO<sub>2</sub>
- CO
- SO<sub>2</sub>



## Meta information

Title: Air quality visualisation – relationships & composition

Author: Soh Zhi Tying

Date: 22/9/2025

Sheet: 4

Task: Explain why air quality worsens

## Focus

- Scatter plot shows relationship between rainfall and API
- Stacked bar chart shows regional pollutant composition
- Lollipop ranks pollutants by overall contribution

## Operations

- User can filter scatter plot by state
- User can hover on scatter points → see rainfall + API values
- User can toggle stacked bar chart → absolute values vs composition
- User can hover over lollipop → see pollutant values and percentages

## Discussion

Advantages:

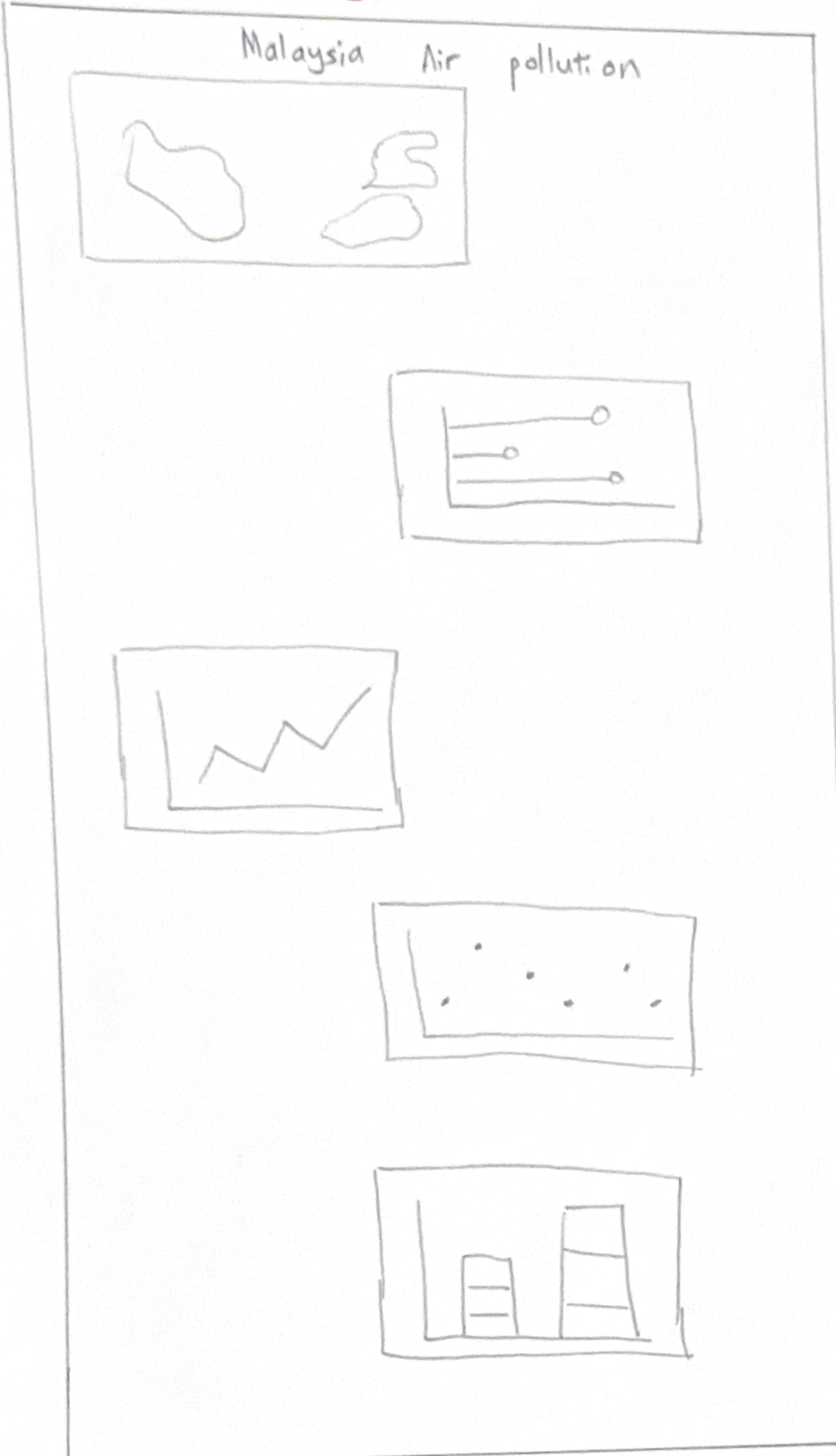
- explain "why" → weather + pollutants, show ranking & regional differences

Disadvantages

- Multiple charts may overwhelm some users, careful coordination needed to avoid confusion

## Sheet 5

## Big picture / Layout



## Part 1 | Focus

- Explore relationship between different states in Malaysia
- Discover which air pollutant contributes most to air pollution
- Explore relationship between rainfall and air quality in Malaysia
- Discover air quality between rural and urban area.

## Components | Operations

- Hover tooltips reveal state name, api level, month and air pollutant
- Has month and state selection option
- A line is shown in scatter plot to show average api level of each state based on selection month.

## Details

## 1. Dependencies

- API for air pollutant
- API level for each state
- Rainfall vs API level
- API level in rural & urban area

## 2. Time &amp; effort estimate

3 weeks

## 3. Requirement

- laptop with  $\geq 8\text{GB}$  RAM
- Deployment via VegaLite & VScode

Title : Malaysia Air Quality Level Dashboard

Author : Soh Zhi Tying

Date : 24/9/2025

Sheet number : 5

Task : Visualise the air quality across Malaysian states.