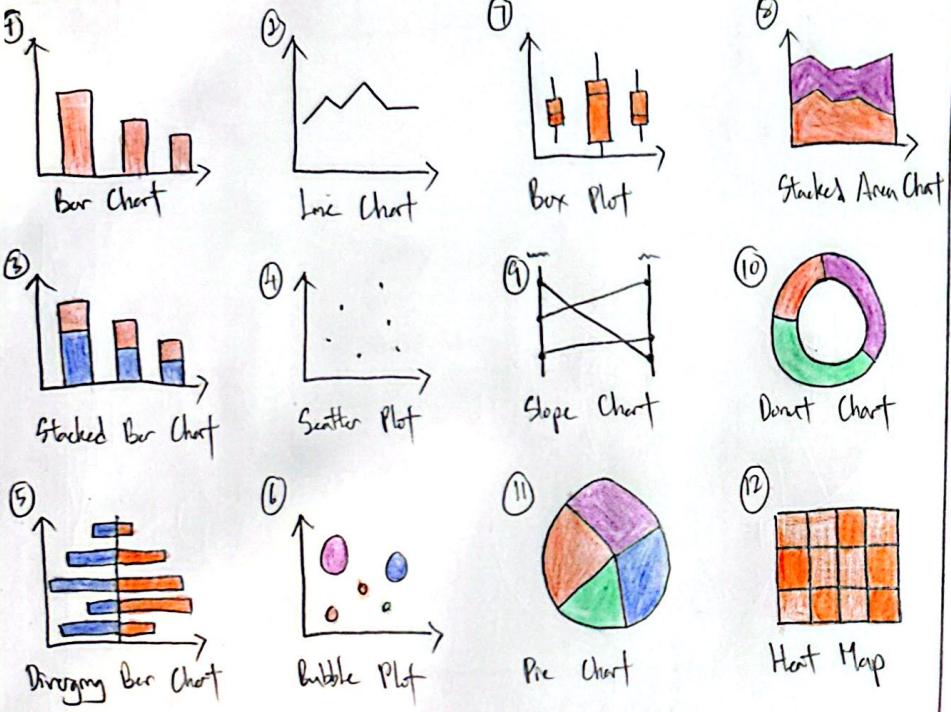
IDEAS

MAPS : [to show the population]
- choropleth map (regions are shaded by colour intensity)
  - colour = (population of each state / total population) x1000
- proportional symbol map (each region circle size = population)
  - Map base = Malaysian States
  - Circle size = population

[Education]
- dot map (one dot = one school, colour = school type, size = enrolment)
  - could represent the individual school or enrolments point on a map.

OTHER IDIOMS :



Planning to show one year data of the population and student enrolments, don't have much categorical data like all two - three category only...

FILTER

Since I am planning to do one year data only :

X Line Chart → needs time points

X Stacked Area Chart → needs time points, two

X Slope Chart → need comparing two time points

These idioms that needed more time data could be filtered out first.

CATEGORIZE

For comparison :

① Stacked Bar Chart ⑥ Bubble Plot

⑦ Diverging Bar Chart ⑧ Heat Map

- These chart/idioms could help in comparison or showing relationship, could use them to show comparison of the quantitative value (student enrolments, population of each state).

For showing portion :

⑩ Donut Chart ⑪ Pie Chart

- These chart could help showing portion of the categorical value like the portion of population of age groups, etc.

For distribution / variation :

⑦ Box Plot could help shows how the data spread and identifies medians, quartiles, outliers.

COMBINE AND REFINE

①+② ② is better

Bar Chart and Stacked Bar Chart are basically the same so I could choose stacked bar chart that could show more value like the categorical one such as the school level, gender, races, etc. for exp, using stacked bar chart to show the student enrolments of each education stages so we could know which state

④+⑥ ⑥ is better

Scatter Plot and Bubble Plot have not much difference except I could show one more value with Bubble Plot. So I could use Bubble plot for showing something like the relationship between the population and enrolments and at the same time I could show one more value with the bubble size. For exp, the student ratio to the population, etc.

QUESTION

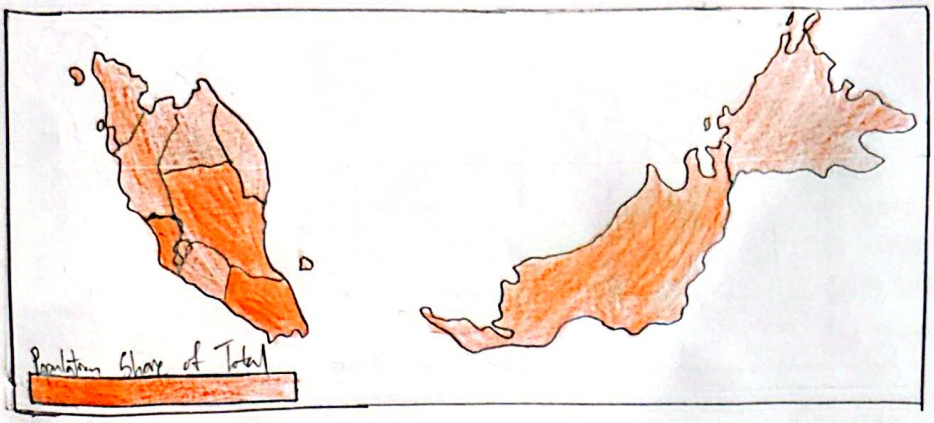
- Could this visualisation tell the population information? showing the population counts, or other more info like the age group, gender?
- Could this visualisation tell the enrolment information? showing the student counts or other more info like gender, education level?
- Could I see the relationship between population and student enrolments with this visualisation?

LAYOUT

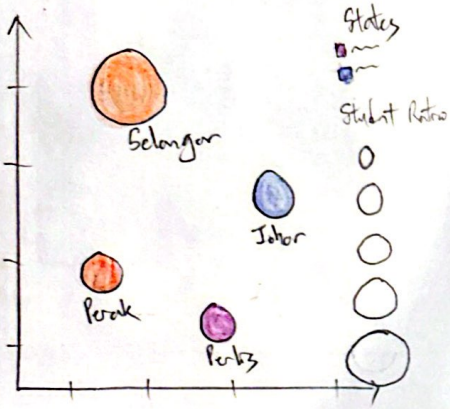
Title: Fit 3179 - Data Visualization 2
Author: Soene Tan Yee Siwen
Date: 1/10/2025
Sheet number: Sheet 2
Task: Design a dashboard that shows the population by state on the map, relationship between total population and student enrolments and student enrolments of each state

POPULATION AND STUDENT ENROLMENTS OF MALAYSIA (2022)

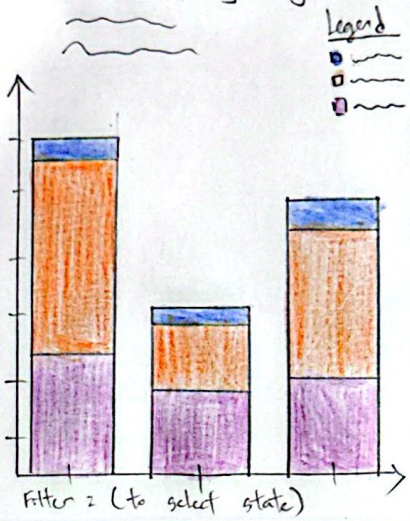
Population by state (with choropleth map: showing population ratio)



Total Population vs Student Enrolments



Student Enrolments of each states by stages



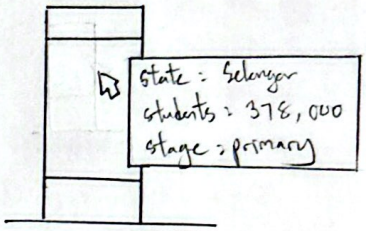
OPERATION

FILTER:

① filter for stacked bar chart
- users could select which state / stages to have better visual.

HOVER TOOLTIP:

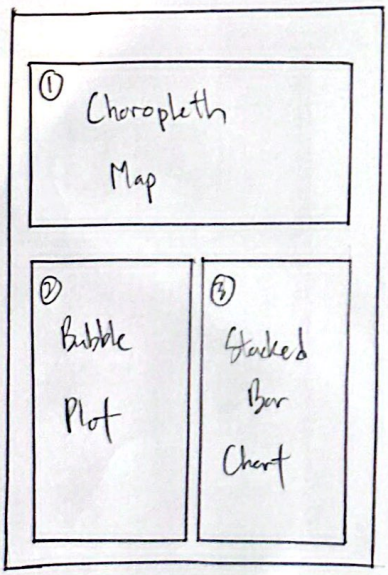
① hover tooltip on each chart / map:
- users could view the exact values of the data (states, student, ...)



LEGEND:

① Legend for each chart to specify what is the colour encoding.

FOCUS



① Choropleth Map
- used the share % of each state as the normalised data (population of each state / total population)
- people could see which state dominate the population from this.

② Bubble Plot
- the size of the bubble is the student ratio
- easily to spot that have higher student enrolments compare to their population

③ Stacked Bar Chart
- show the student enrolments of each state of each stages (primary, secondary, post-secondary).
- have filter to see each state / stages user want to see.

DISCUSSION

ADVANTAGES:

① people could know directly which state have largest share of population

② people could know the relationship of population and enrolments for each state

③ people could see which stages have the highest share / which state has the highest student enrolments directly.

DISADVANTAGES:

① only observe population and enrolments of 1 year, could observe much pattern

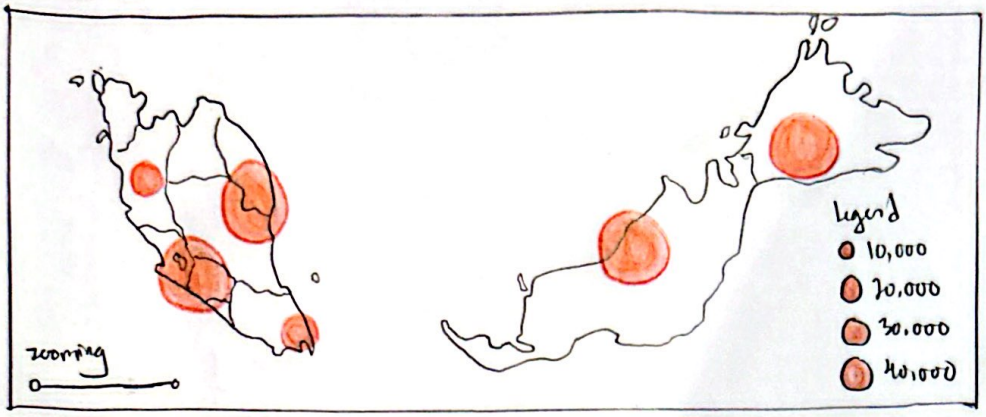
② stacked bar chart / bubble plot may be cluttered if text annotations added

LAYOUT

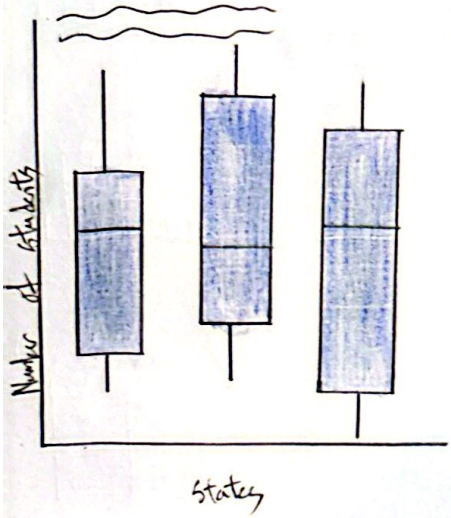
Title: FIT 3179 - Data Visualisation 2
Author: Soeve Tan Yee Shuen
Date: 1/10/2025
Sheet Number: Sheet 3
Task: Design a dashboard that shows population by state, student enrolments of each state and the population by age group.

POPULATION AND STUDENT ENROLMENTS OF MALAYSIA (2022)

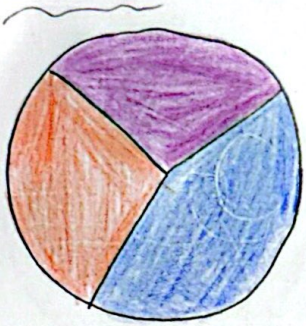
Population by State (with proportional symbol map showing population)



STUDENT ENROLMENTS OF EACH STATE



POPULATION BY EACH AGE GROUP.



OPERATION

Zooming function on map:

① The symbol may be overlapping when the population is large but the state are small so zooming could help user decrease the clutter.

HOVER TOOLTIP:

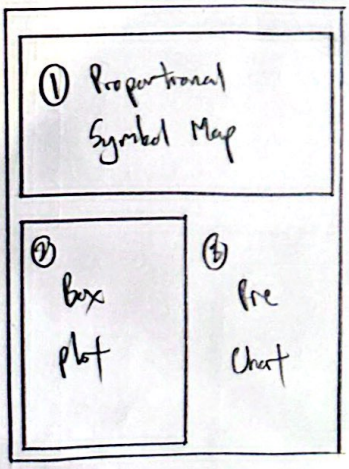
① hover tooltip on each chart / map that could show the exact value of each data like population size, student enrolments counts, population of each age group, etc.

LEGEND and COLOUR ENCODING:

① Legend on the map to tell user what the symbol size means.

② legend on the pie chart to show what each age group includes and colour for each pie with colour hue.

FOCUS



① Proportional Symbol Map
- use the population counts of each state as the symbol to the map with size of the symbol showing the population size
- could see which state has larger population and could tell the largest or smallest population immediately.

② Box Plot
- show the student enrolments counts of each state but not just showing values like average only, we could tell more value with box plot

③ Pie Chart
- shows the share of each age group in one simple chart that is easier to understand

DISCUSSION

ADVANTAGES:

① Could show more than just a average for the student enrolments (like the spread)

② Could instantly shows which state has larger or smaller populations.

DISADVANTAGES:

① Not very intuitive for beginner, people will be hard to understand box plot in first sight if did not know how to read

② The symbol may be overlapping in densely populated that makes the whole map hard to interpret.

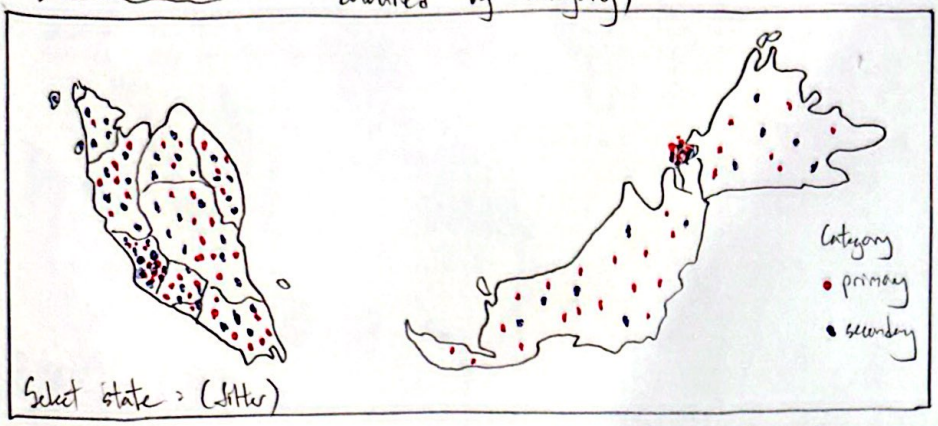
③ Pie Chart may be hard to tell difference

LAYOUT

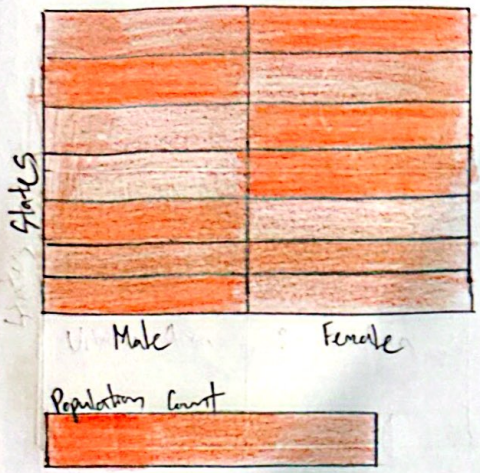
Title: Fit 3179 - Data Visualization 2
Author: Soone Tan Yee Shuen
Date: 1 / 10 / 2025
Sheet Number: Sheet 4
Task: Design a dashboard that shows the school institutions, population by state with gender and the share of education stages

POPULATION AND STUDENT ENROLMENTS OF MALAYSIA (2022)

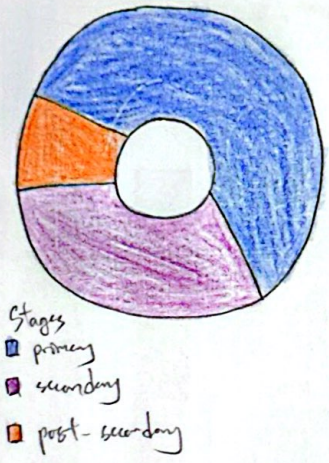
Schools in Malaysia (with dot map showing each school as a dot, coloured by category)



Population by State



Share of Education Stages



OPERATION

FILTER:

① filter for dot map:
- users could select which states data they want to see.
- category could be filter too to avoid cluttered

HOVER TOOLTIPS:

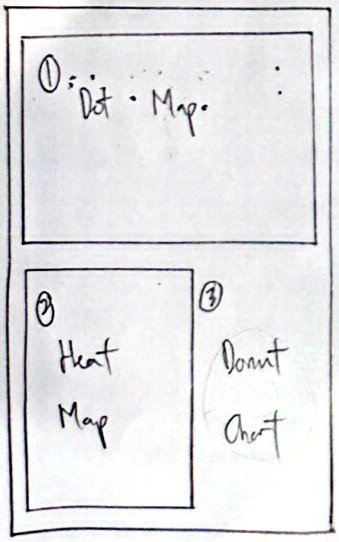
① hover tooltips on each chart/map:
- users could view the data of each chart/map like the population, school counts on that state, etc.

LEGEND and COLOUR ENCODING:

① legend on each chart with suitable colour encoding to interpret that type of value.

legend for heat map.
(darker = more people, lighter = less people)

FOCUS



① Dot Map
- uses the schools in Malaysia as each dot, and coloured the dot by categories like primary schools in red, secondary schools in blue, etc.
- people could see how education institutions spread across Malaysia (more in urban area, insufficient for a state?)

② Heat Map
- Shows the population of each state and their gender distribution too.
- Easy to see which gender has higher population

③ Donut Chart
- shows the portion of student enrolments of each education stages.
- could know how the portion is in one graph

DISCUSSION

ADVANTAGES:

① Good for showing where schools are clustered (know which area have more schools, urban vs rural)

② Highlights the gender pattern for each states and could spot the imbalance quickly.

DISADVANTAGES:

① Donut Chart Emphasises the portions only.

② Require precise location data (coordinates)

③ Hard to count exact total if map crowded

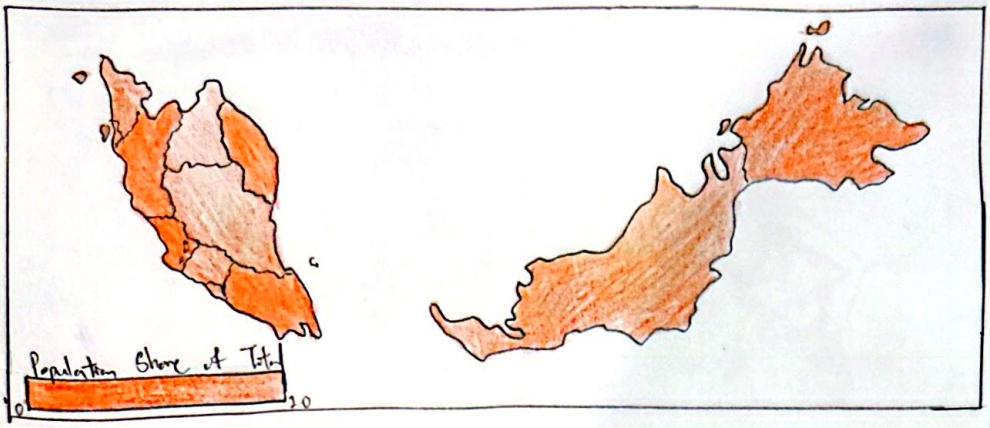
④ Only have two categories to show for Heat Map and hard to see differences

LAYOUT

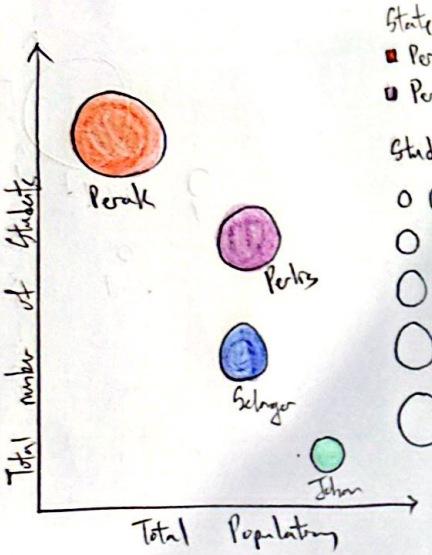
Title: Fit 3179 - Data Visualisation 2
Author: Soene Tan Yee Shuen
Date: 1/10/2025
Sheet Number: Sheet 5
Task: Design the final layout of the dashboard

POPULATION AND STUDENT ENROLMENTS OF MALAYSIA(2022)

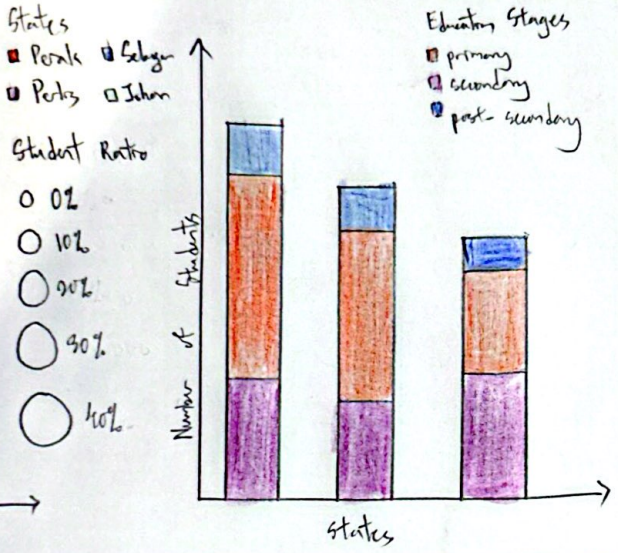
Population by State



Total Population vs Student Enrolments



Student Enrolments of each state by Education Stages



OPERATION

FILTER:

① State Filter - let users focus on specific state on the chart

② Stage Filter - let users focus on specific stage on the chart

HOVER TOOLTIPS:

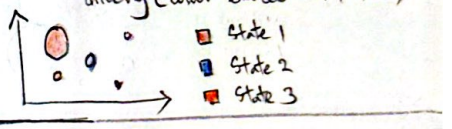
① show exact value of number of student population, student ratio, share of population ... etc. when user hover over a state, bubble, stacked bar.

LEGEND & COLOUR ENCODING

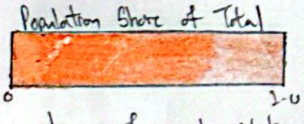
① help users to interpret the scale,

② help users to identify which value should be more focus on (why larger, why lower)

For exp: Look at the biggest bubble directly (colour encoded with red)



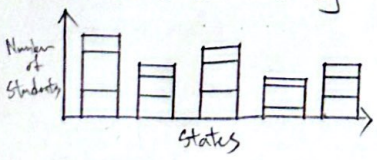
FOCUS



① Choropleth map
- show the population share of each state.
- user could know which state dominate by the colour encode (darker has more people, lighter has less people).
- will not be cluttered like dot map, have a clearer look.

② Bubble Plot
- show three value in one chart, total number of students, total population and student ratio of each state.
- people could know some information like is the student ratio of the state with largest population also the lowest?

③ Stacked Bar Chart
- show the distribution of student of each state and stages.
- could know which stage have more student and why.



- people could dig deeper to find the reason why some state has higher student ratios than the other states when their population is big / small.

DETAIL

DEPENDENCIES:

- TOOL: VEGA-LITE, EXCEL
- DATASET: data.gov.my

ESTIMATE OF TIME / WORKLOAD:

- Data preparation: 5 ~ 6 hours
  - cleaning, aggregation
- Dashboard design: 8 ~ 12 hours
  - chart creation, layout testing, colour
- Interactivity Setup: 4 ~ 5 hours
  - filter, tooltips, legends
- Testing & Refinement: 4 ~ 5 hours
  - usability check, clarity improvement