IDEAS

BAR CHART:
Total arrivals in each state

Total Arrivals / States
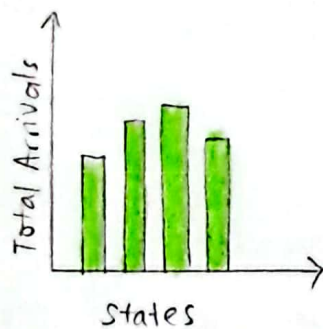
DOT PLOT:
Total females and males in each

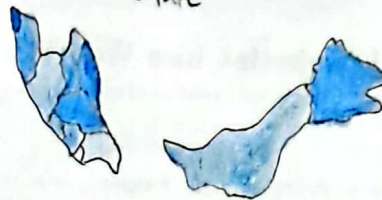*States / Total Arrivals*

Gender
- Female
- Male
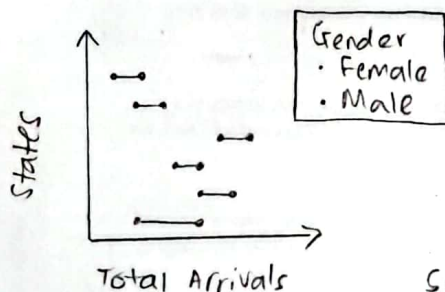
PIE CHART:
Proportions of arrivals in each state

CHOROPLETH MAP
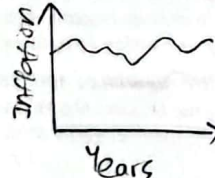Percentage of arrivals in each state

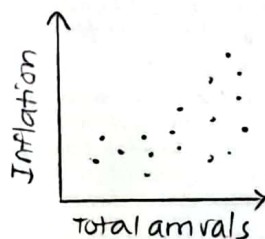**PROPORTIONAL SYMBOL MAP**
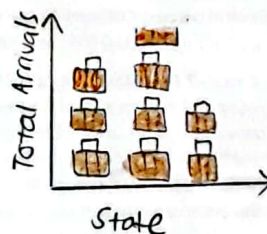Total arrivals in each state

LINE CHART
i) Total arrivals over the years

Total Arrivals / Years

ii) Inflation over the years

Inflation / Years
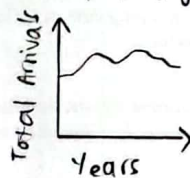
SCATTERPLOT
Effect of total arrivals on inflation

Inflation / Total arrivals

ISOTYPE VISUALISATION
Total arrivals in each state

Total Arrivals / State

CHOROPLETH MAP
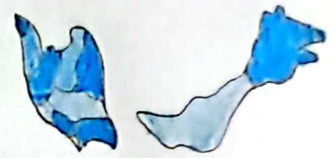
BAR CHART
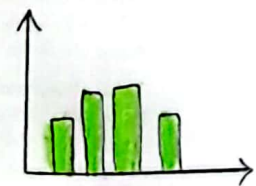
DOT PLOT
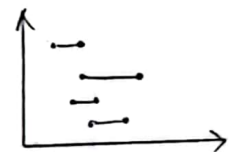
LINE CHART
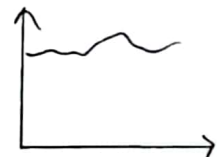
SCATTERPLOT

CATEGORISE

Immigrant Arrivals across each state

↓

Immigrant arrivals across the years

↓

Inflation patterns over the years

↓

Relationship between immigrant arrivals and inflation

COMBINE AND REFINE

Total Arrivals / Years → Plot total arrival trends in each state → *Total Arrivals / Years* — STATES

Inflation / Total arrivals → Adjust colour of dots according to states → *Inflation / Total arrivals* — States
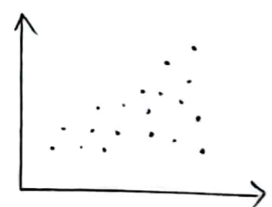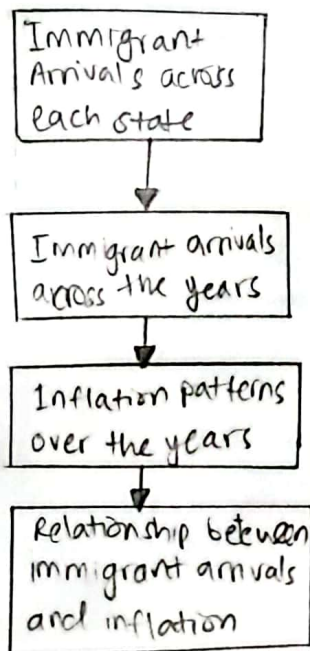
QUESTION

1. Will the density of the data displayed on the modified scatterplots and dotplots overwhelm viewers?
2. Is the relationship between total arrivals and inflation significant?
3. Is the focus on immigrations too much over the focus on inflation?

CamScanner

LAYOUT

IMMIGRATIONS INTO MALAYSIA

Arrival Trends

Total Arrivals (y-axis) vs Date (x-axis)

states
- Perlis
- Penang
...

Inflation Trends

Inflation (y-axis) vs Date (x-axis)

states
- Perlis
- Penang
...

Percentage of Arrivals by State

1%

0%

Text explain states with most immigrants

Total Arrivals by Gender

States (y-axis) vs Total Arrivals (x-axis)

Gender
- Female
- Male

Text explaining gender gap in immigrants

Text summarising entire visualisation

OPERATIONS

TOOLTIPS:

① Hovering over any point in the line charts shows us the State name, total arrivals or inflation rates, and the date.

② Hovering over a dot on the connected dot plot shows the state, total female arrivals, and total male arrivals.

FILTER:

① Clicking on any of the lines or states in the legend displays that line on the graph with the rest of the lines faded.

FOCUS

The flow of the viewer's focus would be:

① First we analyse the trend of immigrant arrivals

② Then, we see how immigrant arrivals affected inflation.

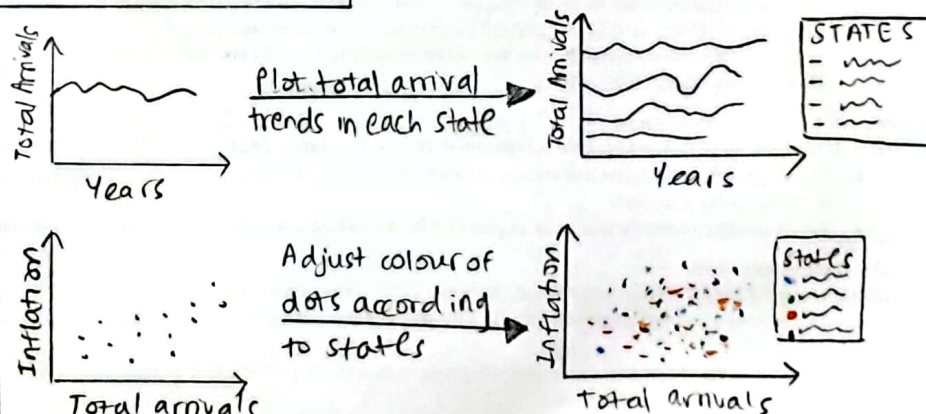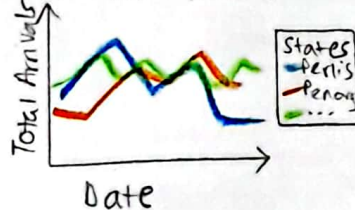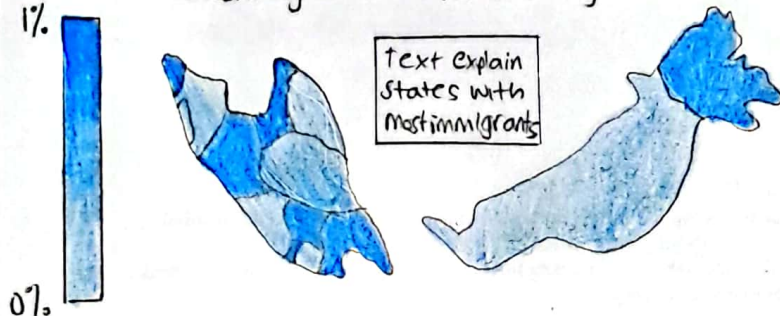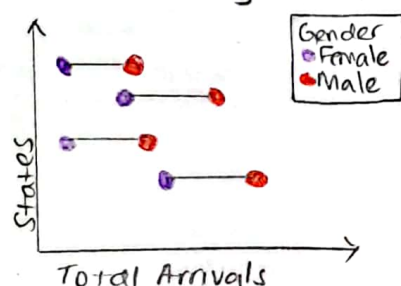③ Then, we visualise the arrivals in each state on a choropleth map

④ Finally, we observe any gender gaps immigrant arrivals...

⑤ which is explained further here.

DISCUSSION

ADVANTAGES:

① The visualisation is informative with text annotations

② The inflation rates can be observed in relation to the arrival trends.

DISADVANTAGES:

① The bottom might be unbalanced if the connected dot plot is skewed.

LAYOUT

IMMIGRATIONS INTO MALAYSIA

Arrivals into Malaysia Trend by State

Total Arrivals — Date

States
- Johor
- Penang
- Perlis

Percentage of Arrivals by State

Text explaining states with most immigrants

1%

0%

Total Arrivals by Gender

States — Total Arrivals

Text explaining gender gap

- female
- Male

Inflation Rates Trend

Inflation Rate — Date

States
- Johor
- Penang
- Perlis
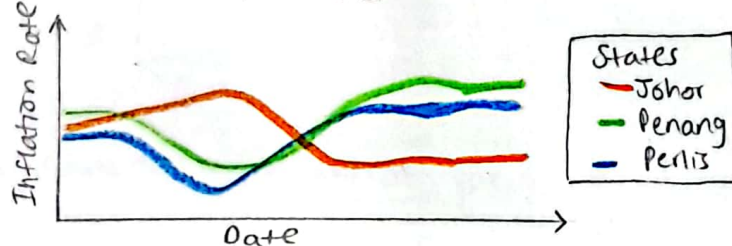
FOCUS

The flow of the viewer's focus would be:

① The trend of arrivals into Malaysia by State

② Then, we compare the number of immigrants in each state

③ Then, we analyse the gender distribution of immigrants

④ Finally, we analyse the inflation rates by state

OPERATIONS

TOOLTIPS:

① Hovering over each point of the line graph shows:

Arrivals:
1. State
2. Total arrivals
3. Date

Inflation rates:
1. State
2. Inflation rate
3. Date

② Hovering over a state in the map shows:
1. State
2. Total arrivals
3. Percentage of immigrants among total population.

FILTER:

① Hovering over one state in the map highlights the state by increasing its opacity.
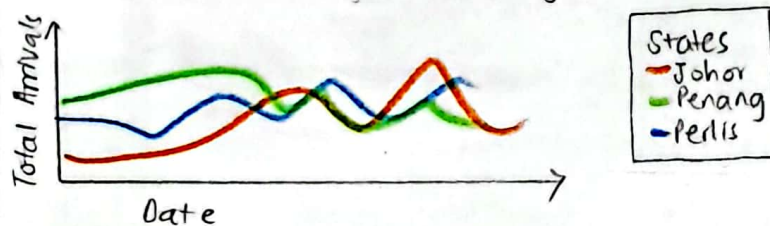
DISCUSSIONS

ADVANTAGES:

① Layout is balanced since there is only one idiom per row.

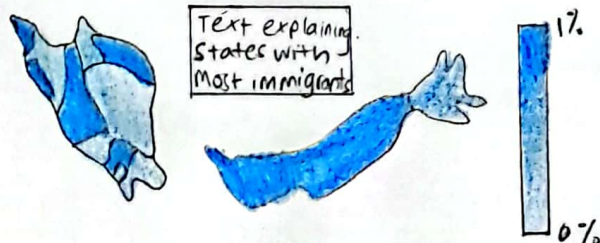② Map is at the visual centre and is the main focus of the visualisation.

DISADVANTAGES:

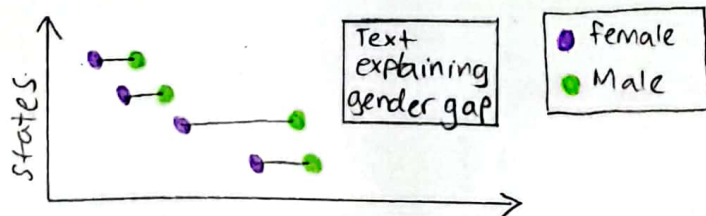① The flow of the map may be hard to follow since the arrival trend and inflation trend are related.

CamScanner

LAYOUT

INMIGRATIONS INTO MALAYSIA

Percentage of Arrivals by State

1%

Text to explain states with most immigrants

0%

Total Arrivals in each state by Gender

Total Arrivals

■ Female
■ Male

State

Arrivals Trend

Total Arrivals

Date

Inflation Rates Trend

Inflation Rate

Date

OPERATIONS

TOOLTIPS:

① Hovering over a state in the map shows us the state name, total arrivals, and percentage of arrivals

State: ∿
Total: ∿
Percent: —

② Hovering over a point in the line charts shows us the total arrivals or inflation rate, and date.

FILTERS:

① Only the top two highest total arrivals will be highlighted in the bar chart. The rest of the bars will be faded out.
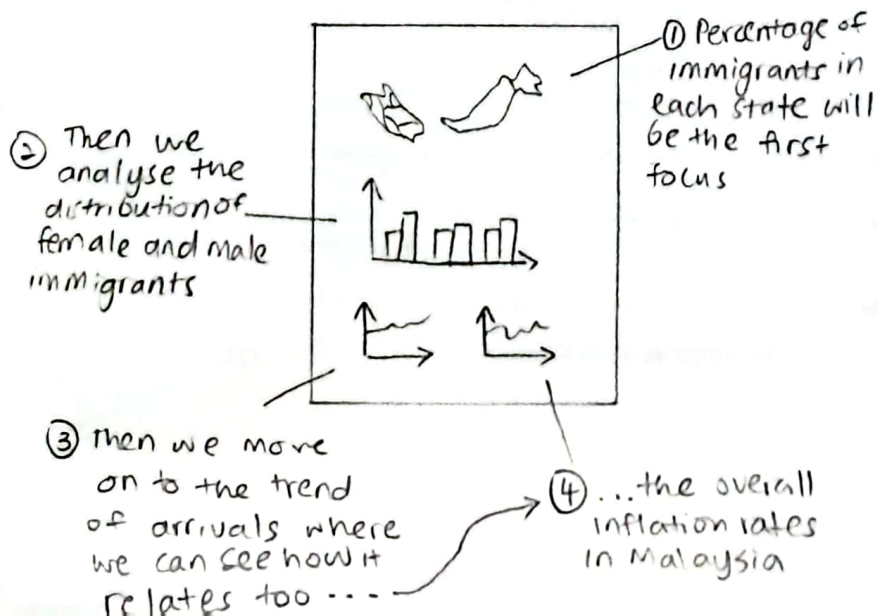
FOCUS

The flow of the viewer's focus would be:

① Percentage of immigrants in each state will be the first focus

② Then we analyse the distribution of female and male immigrants

③ Then we move on to the trend of arrivals where we can see how it relates too ···

④ ...the overall inflation rates in Malaysia

DISCUSSIONS

ADVANTAGES:

① This layout is well balanced
② The flow is easy to follow
③ The operations are easy to navigate and understand.

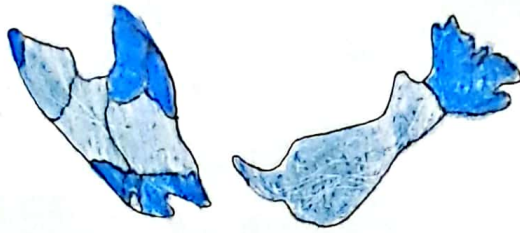**DISADVANTAGES:**

① The line charts might be too empty
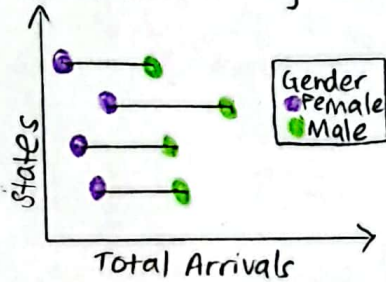② Bar charts and line charts are too simple

LAYOUT

IMMIGRATIONS INTO MALAYSIA

Percentage of Arrivals by State

Text introducing the visualisation

Text explanation

Total Arrivals by Gender

states

Total Arrivals

Gender
● Female
● Male

Text explaining gender gap

Arrival Trends

Total Arrivals

Date

States
— Perlis
— Penang
...

Inflation Trends

Inflation

Date
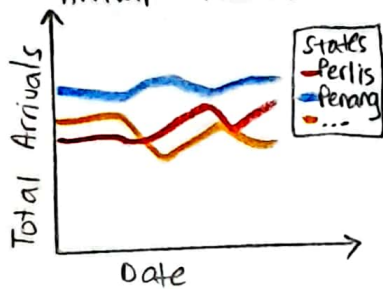
States
— Perlis
— Penang
...
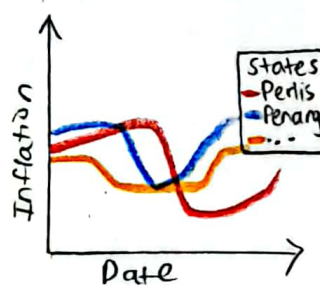
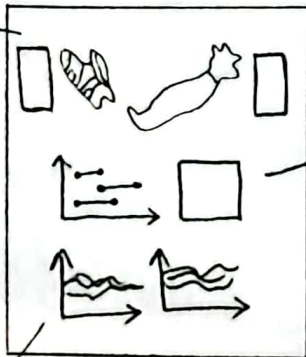## FOCUS

The flow of the viewer's focus would be:

① First, we observe the immigration arrivals in each state

② Then, we break the arrivals down according to gender to analyse the gender gap

③ Finally, we see the effect of immigrant arrivals on inflation rates.

OPERATIONS

TOOLTIPS :

① Hovering over any of the states on the map shows:

1. State
2. Percentage of arrivals compared to total population

② Hovering over any point on the line charts show:

Arrivals linechart
1. State
2. Total arrivals
3. Date

Inflation linechart
1. State
2. Inflation rate
3. Date

FILTERS:

① Clicking on a state in the legend for the line charts will filter only that state's line on the chart.

DETAIL

1. Techniques:
The visualisation will be created using:
   a. Vega-Lite
   b. HTML
   c. CSS

2. Dependencies:
   - RStudio for transforming the raw data.
   - VS Code to operate HTML and CSS.
   - Vega-Lite online editor to create the visualisations

3. Estimated time: (Total 16 hours)
   - 2 hours to transform the data
   - 10 hours for the visualisation
   - 4 hours for the layout

4. Hardware requirements:
   - 1GB RAM for VS Code
   - 4GB RAM for RStudio