Narrative Visualisation Project

The housing market in Victoria

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Activity Number: 09

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INTRODUCTION

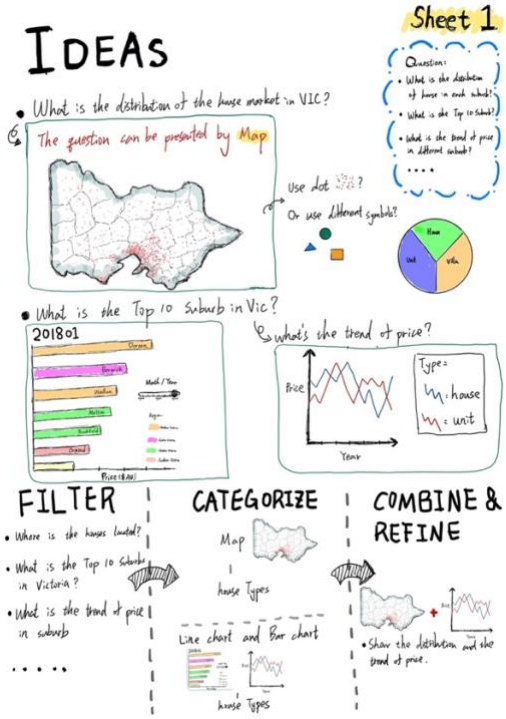
Melbourne, the most liveable and beautiful city in the, attracts millions of tourists, thousands of students, immigrant, real estate investors from all over the world. Therefore, the house market in Victoria becomes up for grabs for every who want to settle down in this beautiful city, Melbourne. The intended audience in this narrative visualization project will be the any people who want to purchase the house in Victoria or who want to invest the real estate in Melbourne. In this project, I will focus three main question. The first one is what's the houses distribution in Victoria. Second is what's the Top 10 suburb in Victoria. The final is how to compare two suburbs. To finish these questions, I will design an interactive narrative visualization by using the five design sheets and implement the visualization as a web-based presentation by using shiny with css in R.

DESIGN

In the following blocks, I will describe the design process of my visualisation. I will focus on the five design sheets, and to talk about what alternative designs I considered and what was the final design looks like.

Sheet 1: Brainstorm

In the sheet 1, I will focus on how to generate all the possible designs. There are five stages in this task. The generate ideas, filter the ideas, categorize the sketches, combine and refine, and question. Here are three main questions I want to answer. The first is what is the distribution of houses in Victoria or in each suburb. Second is what is the Top 10 suburb in each month/year. Third is how to compare two suburbs. To answer these questions, I will use some visualization tools such as map, bar chart race, and line chart to present them.



Sheet 2: Initial Design 1

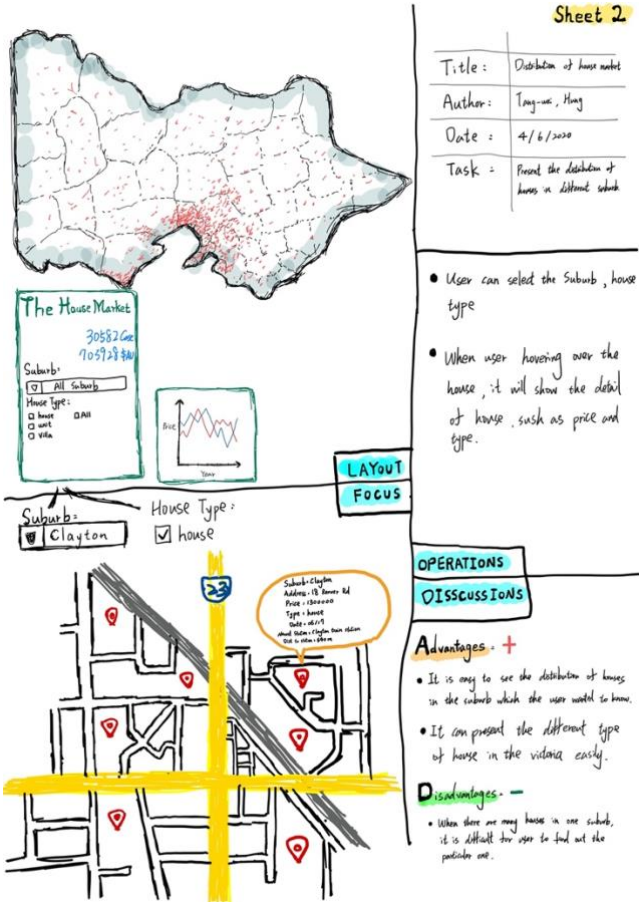
To answer the question of what the distribution of houses in Victoria is or in each suburb is, I use the map to present it. In this initial design, user could select the Suburb, type, and when user click the house, it will show the detail of the house, such as price and type.

Advantages:

1. It is easy to see the distribution of houses in the suburb which the user wanted to know
2. It can present the different type of house easily.

Disadvantages:

1. When there are many houses in one suburb, it is difficult for user to find out the particular ones.



Sheet 3: Initial Design 2

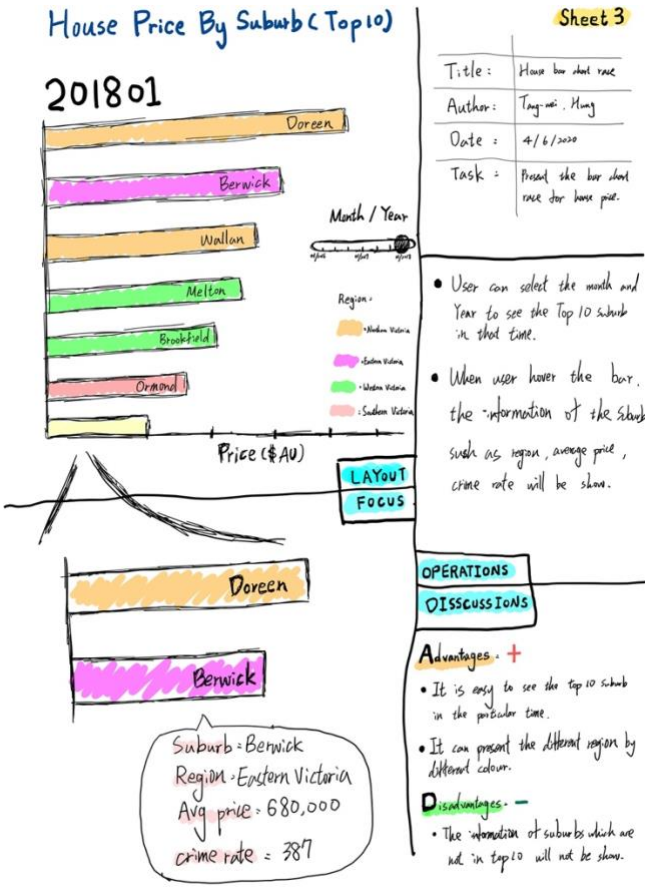
To answer the question what the Top 10 suburb in each month/year is, I use the bar chart race to present it. In this initial design, user could select the year and month, and when user click the bar in bar chart, it will show more information of the suburb.

Advantages:

1. It is easy to see the Top 10 suburb in the particular time.
2. It can present the different region by different colour.

Disadvantages:

1. The information of suburbs which are not in Top 10 will not be shown.



Sheet 4: Initial Design 3

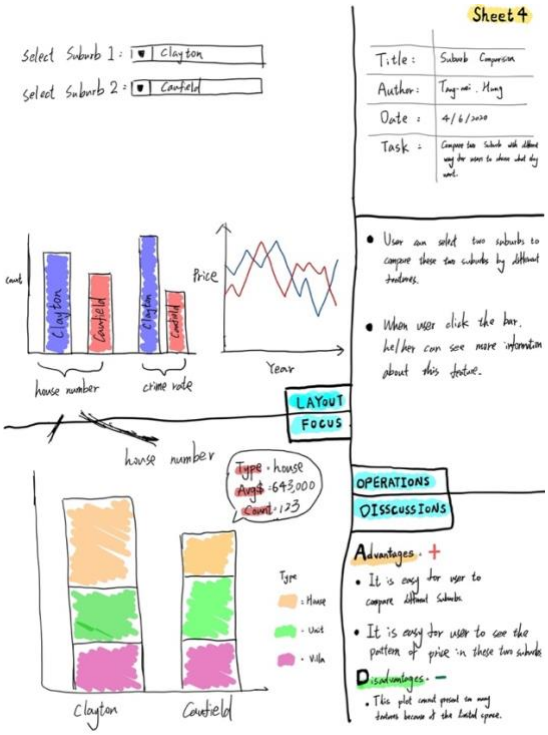
To answer the question that how to compare two suburbs, I use the bar chart, line chart to present it. In this initial design, user could select two suburbs, and when user click the bar in bar chart and click the line in line chart, it will show more detail information.

Advantages:

1. It is easy for user to compare different suburbs.
2. It is easy for user to see the pattern of the price in these two suburbs.

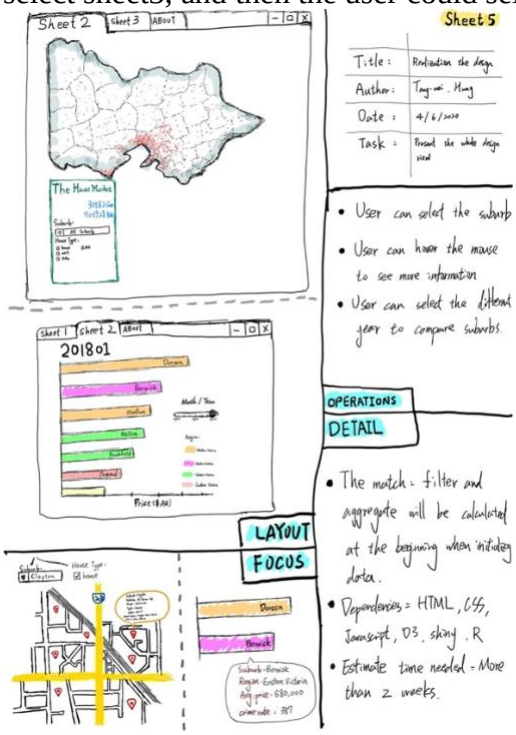
Disadvantages:

1. The plot cannot present too many features because of the limited space.



Sheet 5: Final Design

In the final design, I will present the initial design from 1 to 3 in different tabs. If the user wants to know the distribution of the houses in Victoria, he or she could select the sheet 1. The user can select the suburb to find the house distribution in that suburb and then click the house to find more information. If the user wants to know the Top 10 suburb, he or she could select the sheet 2. Besides, the user could select the month and year from slider and then click the bar to see more detail. If the user wants to compare two suburbs, the user could select sheet3, and then the user could select two suburbs to compare them.



IMPLEMENTATION

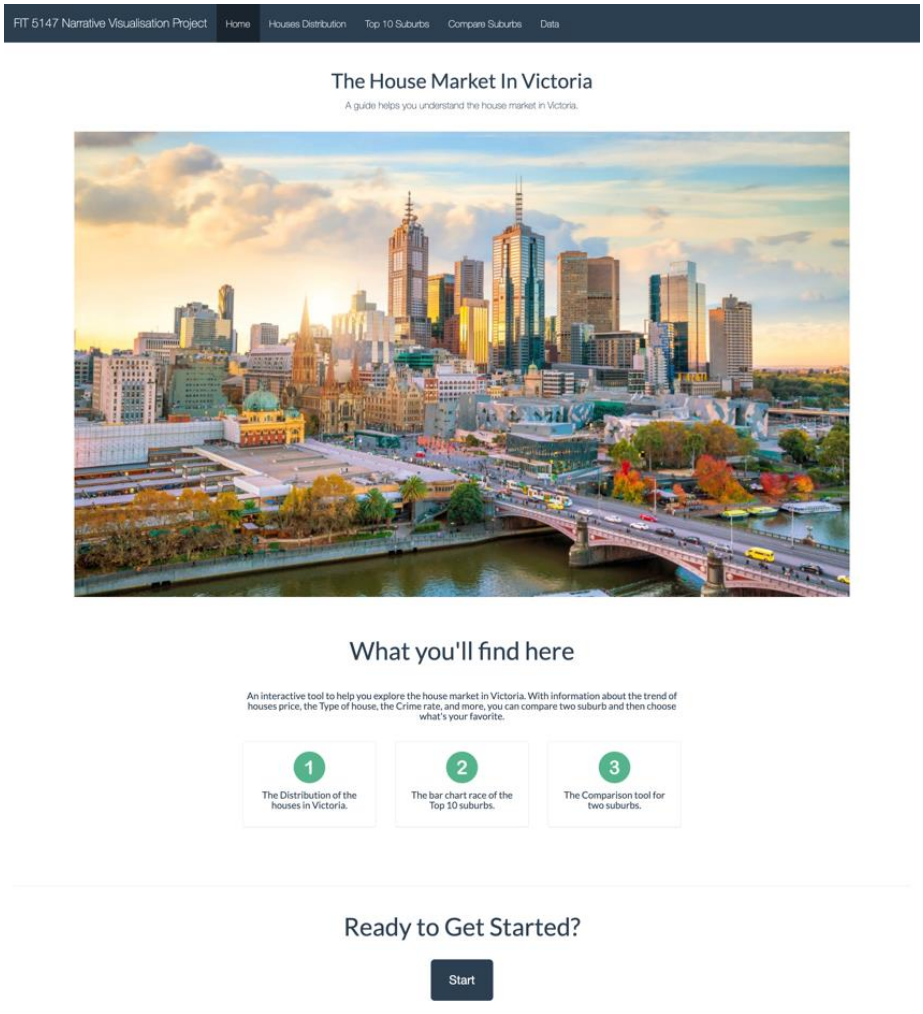
In the part of implementation, I will mainly use Shiny in R to perform the narrative visualization. Besides, I also use styles.css for the css design in Shiny. The library I will use in Shiny are: shiny, leaflet, shinythemes, plyr, dplyr, tidyr, ggplot2, and plotly. The library of leaflet could help me plot the map, the shinythemes could help me change the theme in shiny, the plyr, dplyr, tidyr could help process the data, and the plotly could help to plot the interactive plot.

USER GUIDE

In this section, I will describe the five tabs. The one is home sheet and one is data sheet. Other three main sheets are narrative visualisation which are house distribution, Top 10 suburb, and comparison tool.

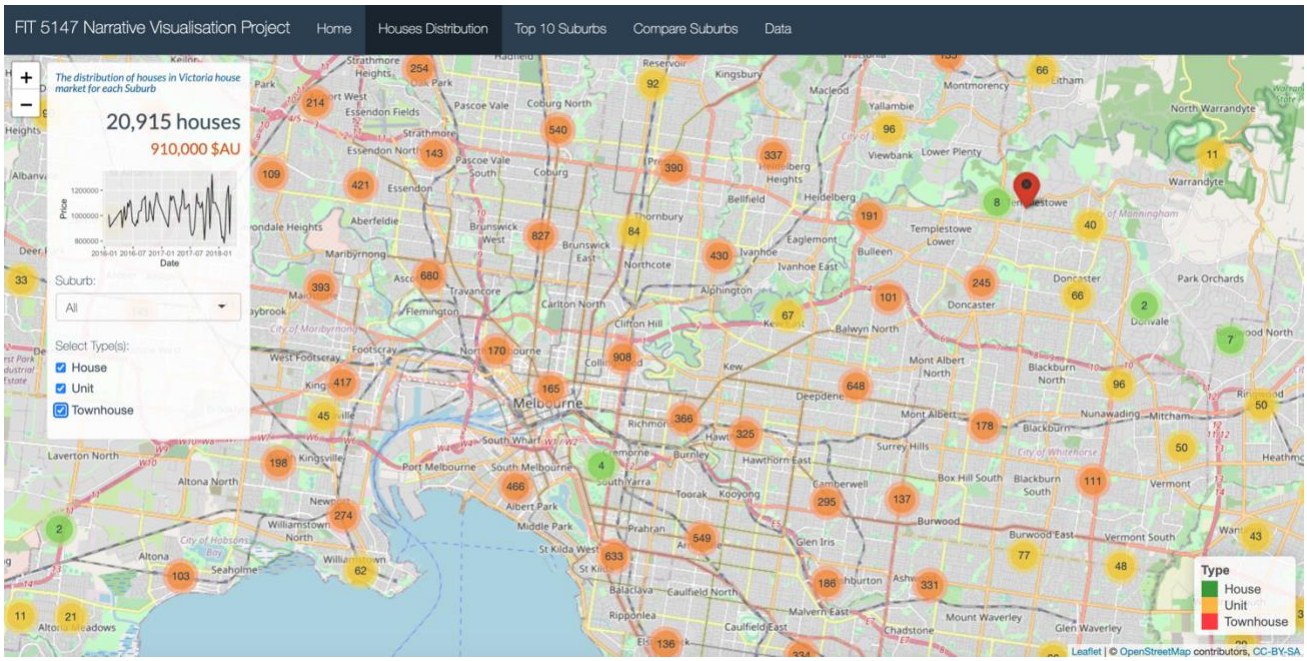
Home Page:

In this Page, user would know what he or she could find in this narrative visualisation project. Besides, there is a start button, and if user push the start button, it will bring user to the sheet of House Distribution.

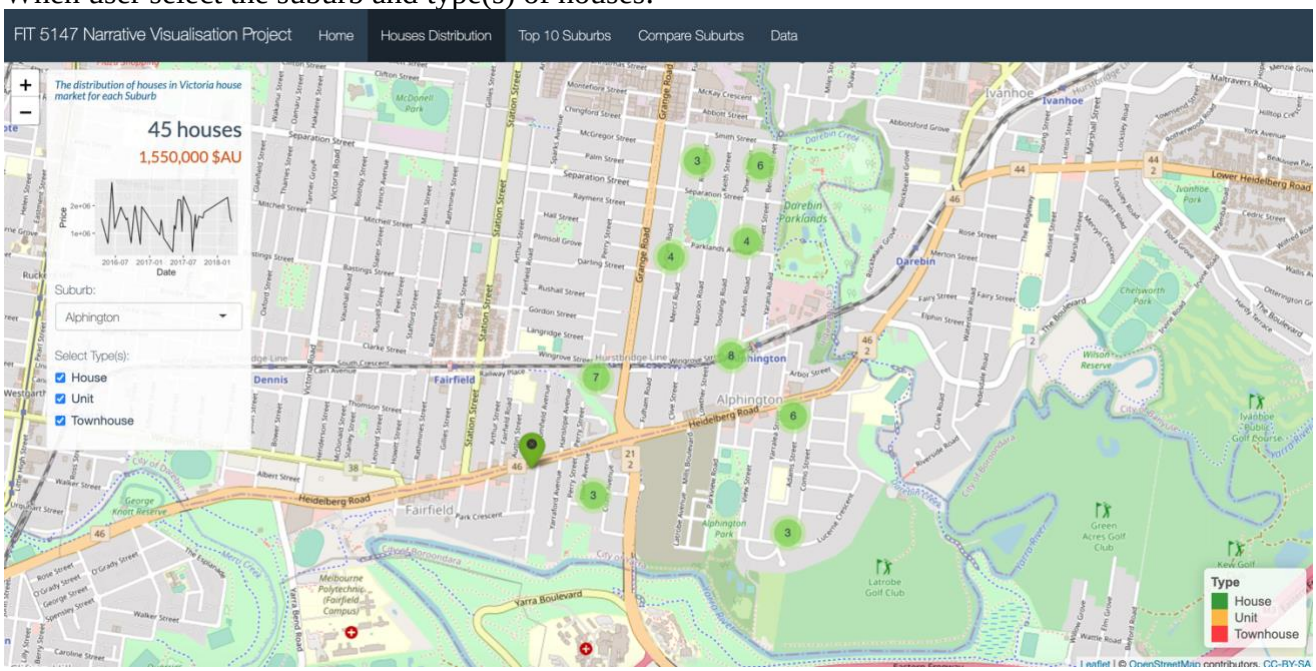


House Distribution:

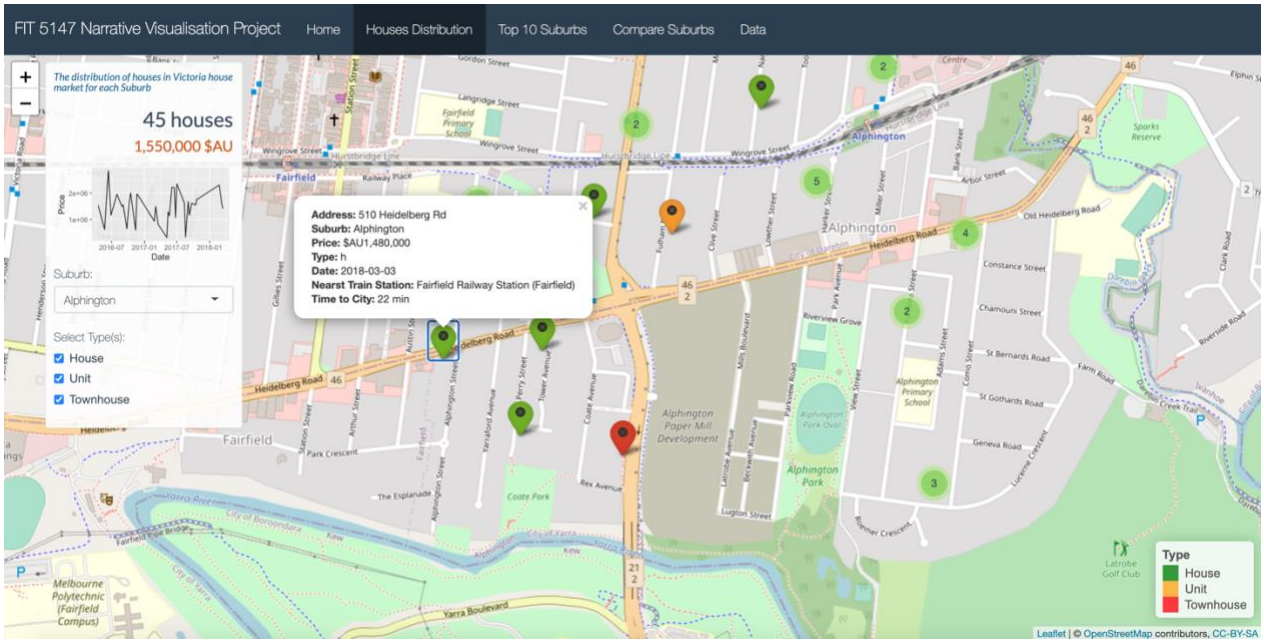
In the sheet of house distribution, user could find the distribution of the house market in Victoria by selecting the suburb he or she interest and using checkbox to choose the type of house. After user selected the suburb and the type of house, the number of the total houses, the average price and the trend of price in this condition will be shown on the tooltip, and the map will also be changed. Besides, user could click the mark in the map to see more information about this house, and user could use the color to distinguish different type of house.



When user select the suburb and type(s) of houses:



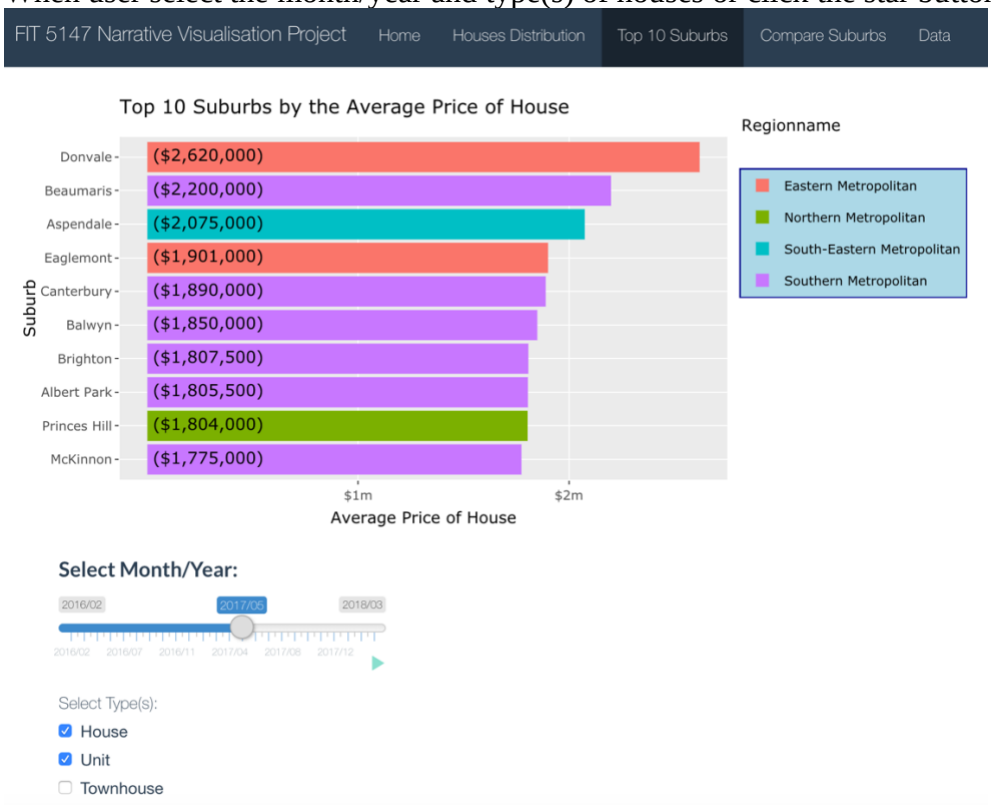
When user click the mark:



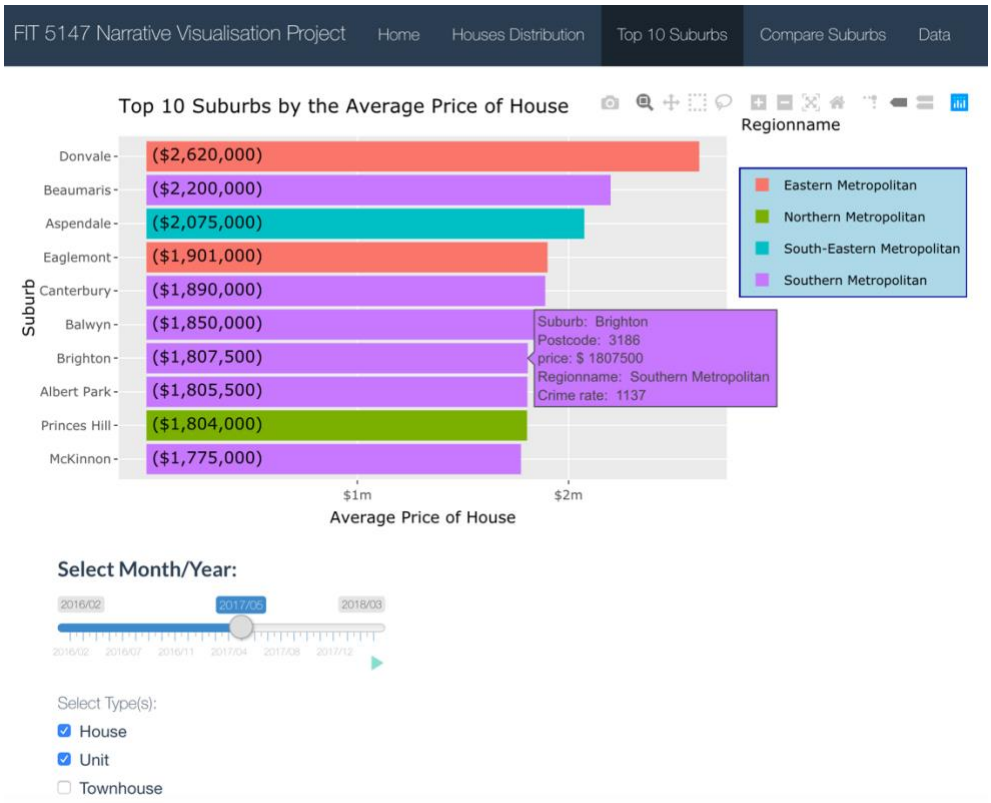
Top 10 Suburbs:

In the sheet of Top 10 suburb, user could find the Top 10 suburbs in the particular month and year by selecting the month and year from slide or user could click the start button to automatically present the bar chart race. Besides, when user click the bar, it will show more information.

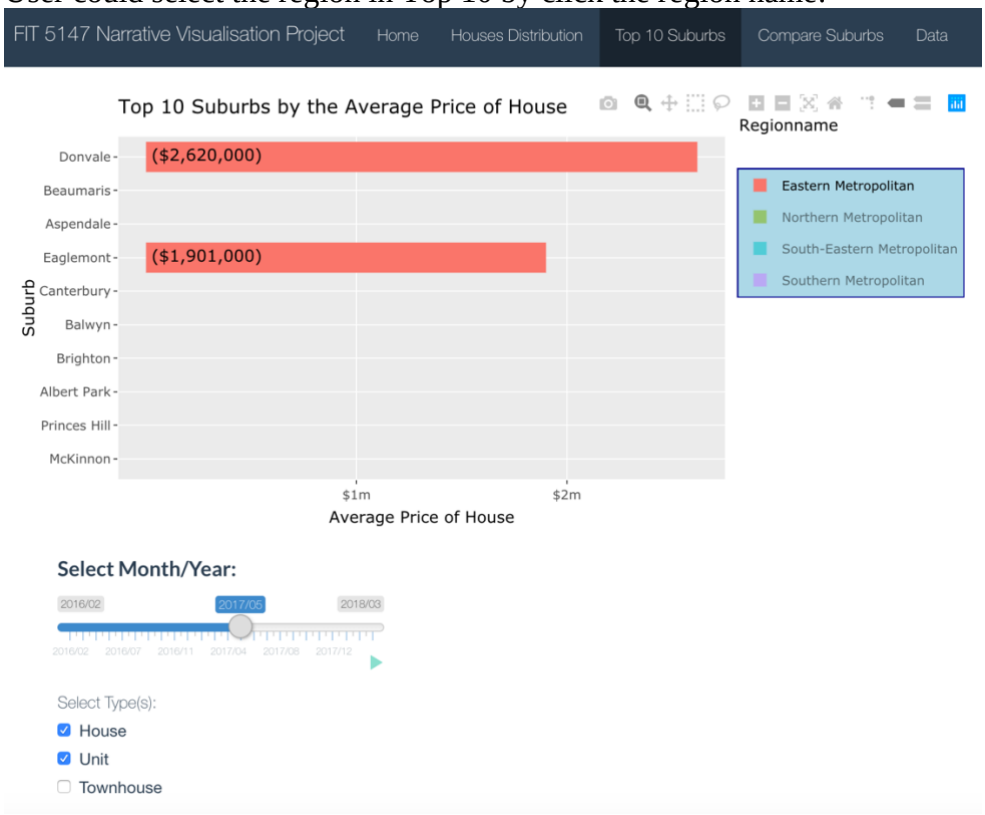
When user select the month/year and type(s) of houses or click the star button:



When user click the bar:

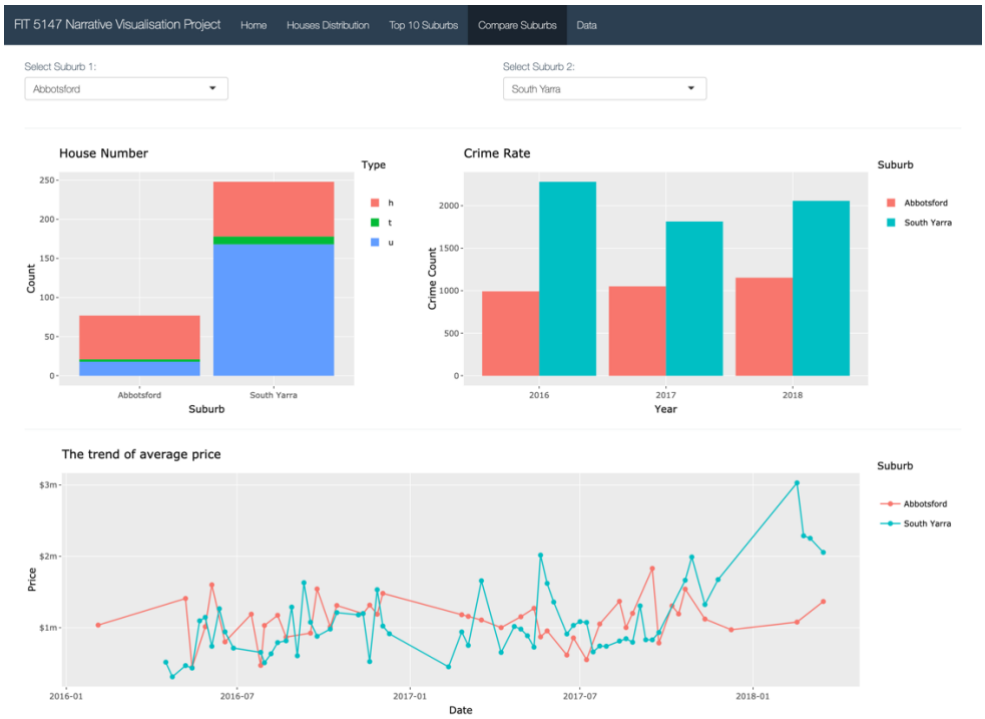


User could select the region in Top 10 by click the region name:

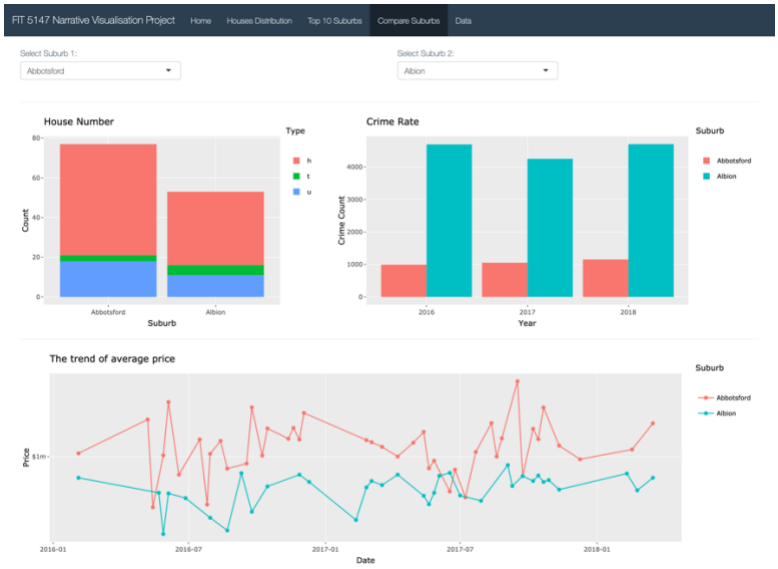


Suburb comparison:

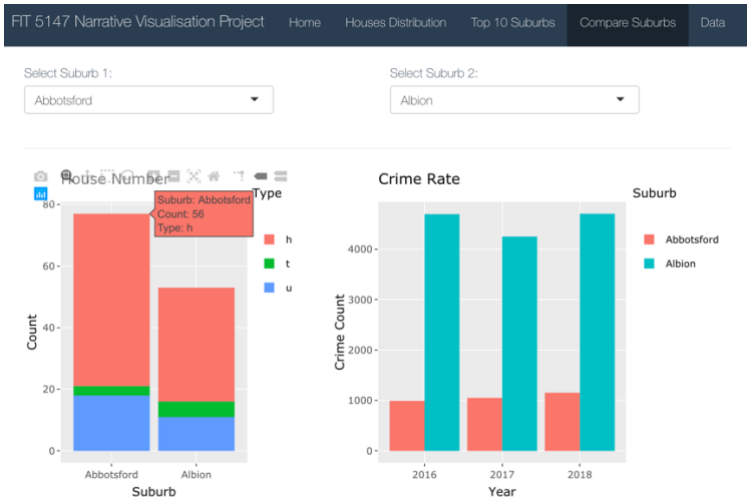
In the sheet of suburb comparison, user could compare two suburbs in trend of price, number of houses, and the crime rate by selecting two suburbs. Besides, when user click the bar, it will show more information.

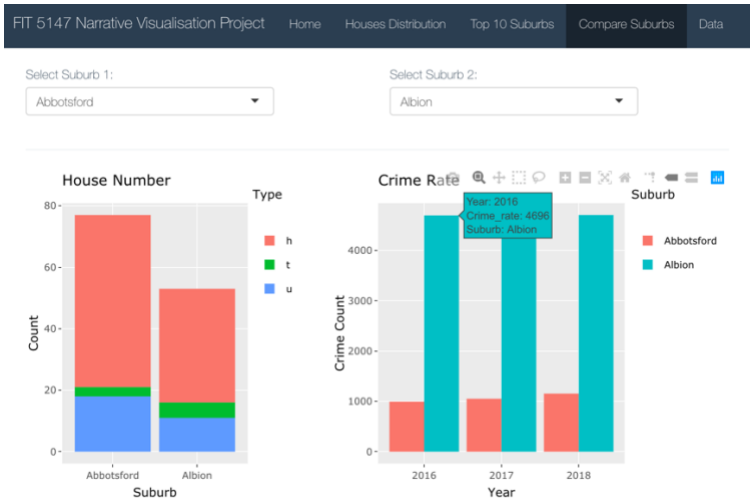


When user select two suburbs:

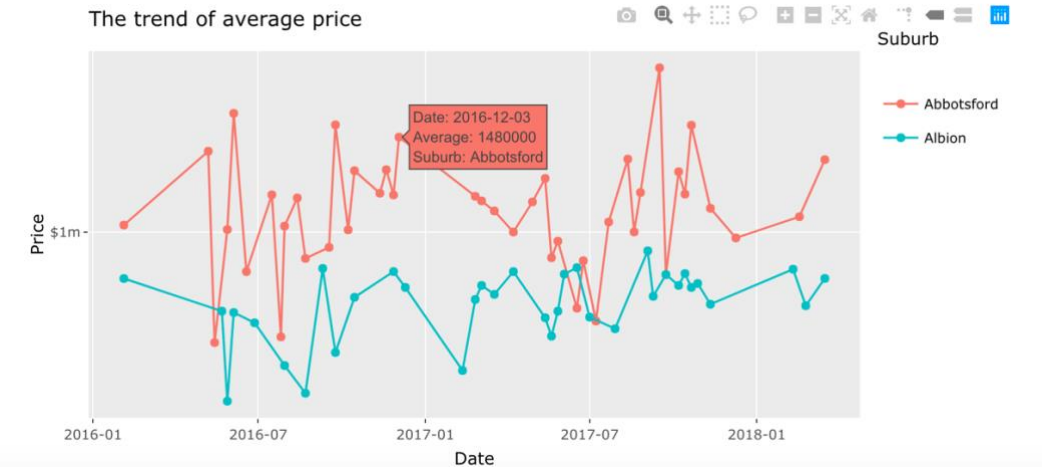


When user click the bar:



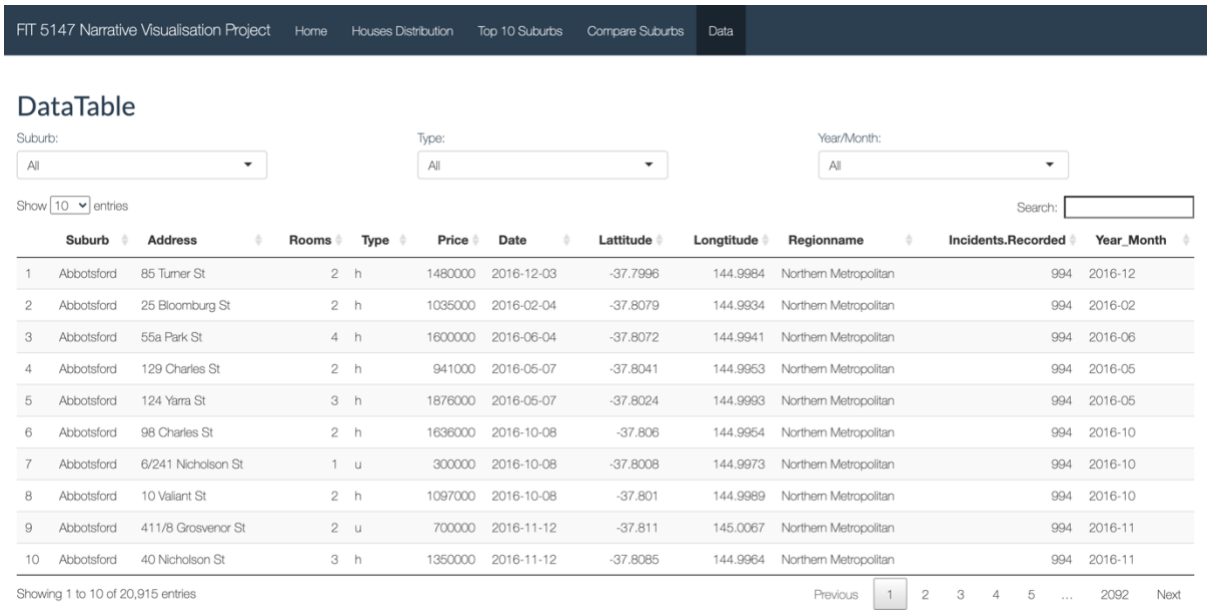


User could click the line to see more information:



Data Table:

In the sheet of Data Table, user could view all the data we use in this narrative visualisation project. Besides, user could set some condition to find the particular data in this data table.



	Suburb	Address	Rooms	Type	Price	Date	Lattitude	Longtitude	Regionname	Incidents.Recorded	Year_Month
1	Abbotsford	85 Turner St	2	h	1480000	2016-12-03	-37.7996	144.9984	Northern Metropolitan	994	2016-12
2	Abbotsford	25 Bloomburg St	2	h	1035000	2016-02-04	-37.8079	144.9934	Northern Metropolitan	994	2016-02
3	Abbotsford	55a Park St	4	h	1600000	2016-06-04	-37.8072	144.9941	Northern Metropolitan	994	2016-06
4	Abbotsford	129 Charles St	2	h	941000	2016-05-07	-37.8041	144.9953	Northern Metropolitan	994	2016-05
5	Abbotsford	124 Yarra St	3	h	1876000	2016-05-07	-37.8024	144.9993	Northern Metropolitan	994	2016-05
6	Abbotsford	98 Charles St	2	h	1636000	2016-10-08	-37.806	144.9954	Northern Metropolitan	994	2016-10
7	Abbotsford	6/241 Nicholson St	1	u	300000	2016-10-08	-37.8008	144.9973	Northern Metropolitan	994	2016-10
8	Abbotsford	10 Valiant St	2	h	1097000	2016-10-08	-37.801	144.9989	Northern Metropolitan	994	2016-10
9	Abbotsford	411/8 Grosvenor St	2	u	700000	2016-11-12	-37.811	145.0067	Northern Metropolitan	994	2016-11
10	Abbotsford	40 Nicholson St	3	h	1350000	2016-11-12	-37.8085	144.9964	Northern Metropolitan	994	2016-11

CONCLUSION

In this house market in Victoria narrative visualization project, we use the interactive visualization tools, such as map, bar chart, and line chart to answer the questions of what's the distribution of house in each suburb, what's the Top 10 suburb in particular month and year, and how to compare two suburbs. In the part of house distribution of houses, user can select the suburb he/she interested and then find more information about the trend of price in this suburb and detail of the house. In the part of Top 10 suburb, user can select the month/year form slider to see the Top 10 suburb in that time, and he/she could click the bar to see more information. In the part of suburb comparison, user could select two suburbs to compare them, and the user can click the bar and line to find more information.

In this project, I learned how to design an interactive narrative visualization by using the five design sheets methodology, and then implement my visualization as a web-based presentation by using shiny with css in R to present the interactive plot with the user. Finally, in the future, maybe I could try to use the JavaScript and D3 to present the interactive plot and try different element to introduce more interaction with user.

BIBLIOGRAPHY

1. Melbourne Housing Data from 2016 to 2018 (34858 rows x 21columns)
   (URL: https://www.kaggle.com/anthonypino/melbourne-housing-market)

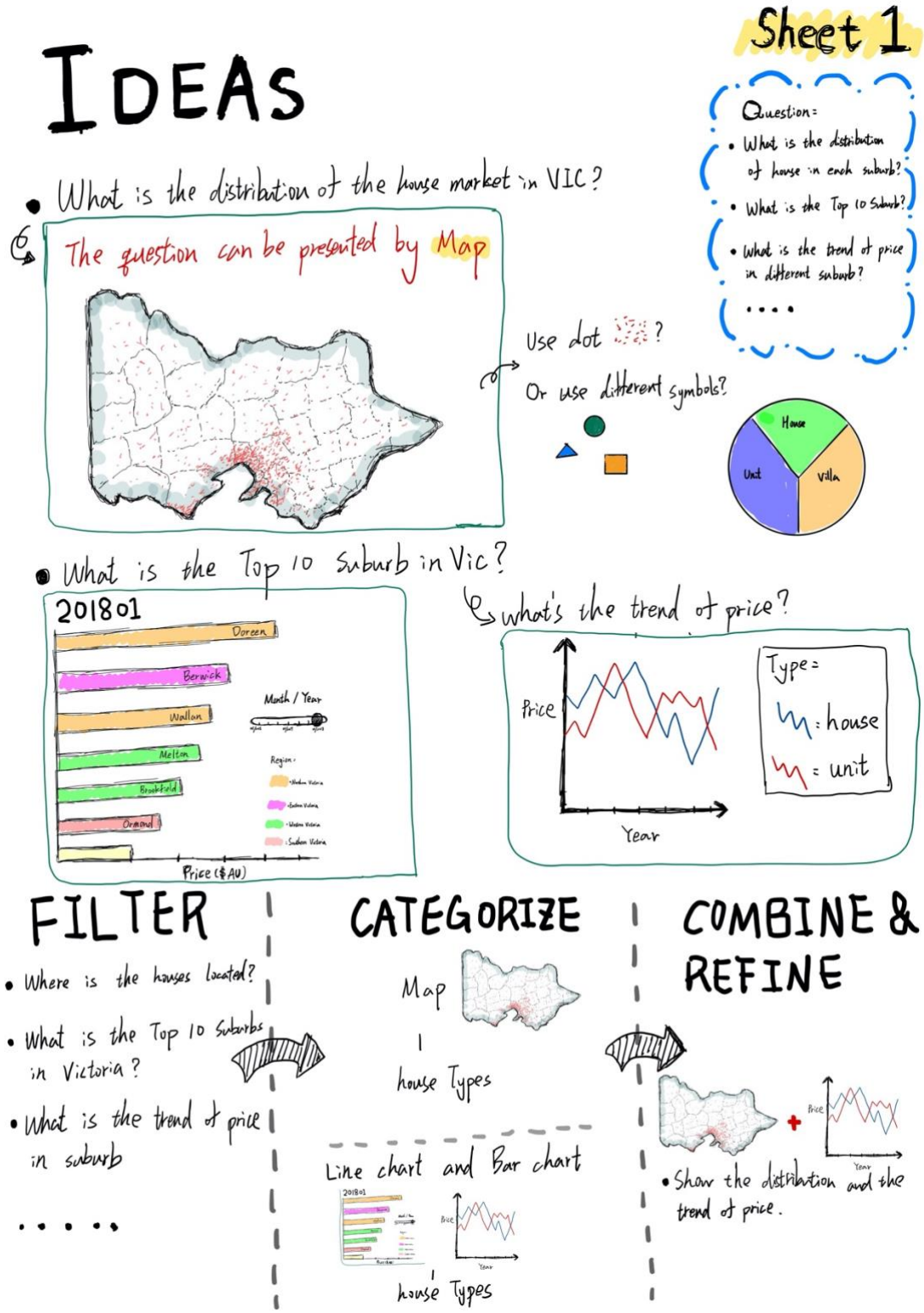
2. Victoria crime incident data from 2009 to 2018(284098 rows x 7 columns)
   (URL: https://www.crimestatistics.vic.gov.au/crime-statistics/historical-crime-data/year-ending-31-december-2018/download-data)

3. PTV timetable and Geographic Information (GTFS format)
   (URL: https://discover.data.vic.gov.au/dataset/ptv-timetable-and-geographic-information-2015-gtfs)

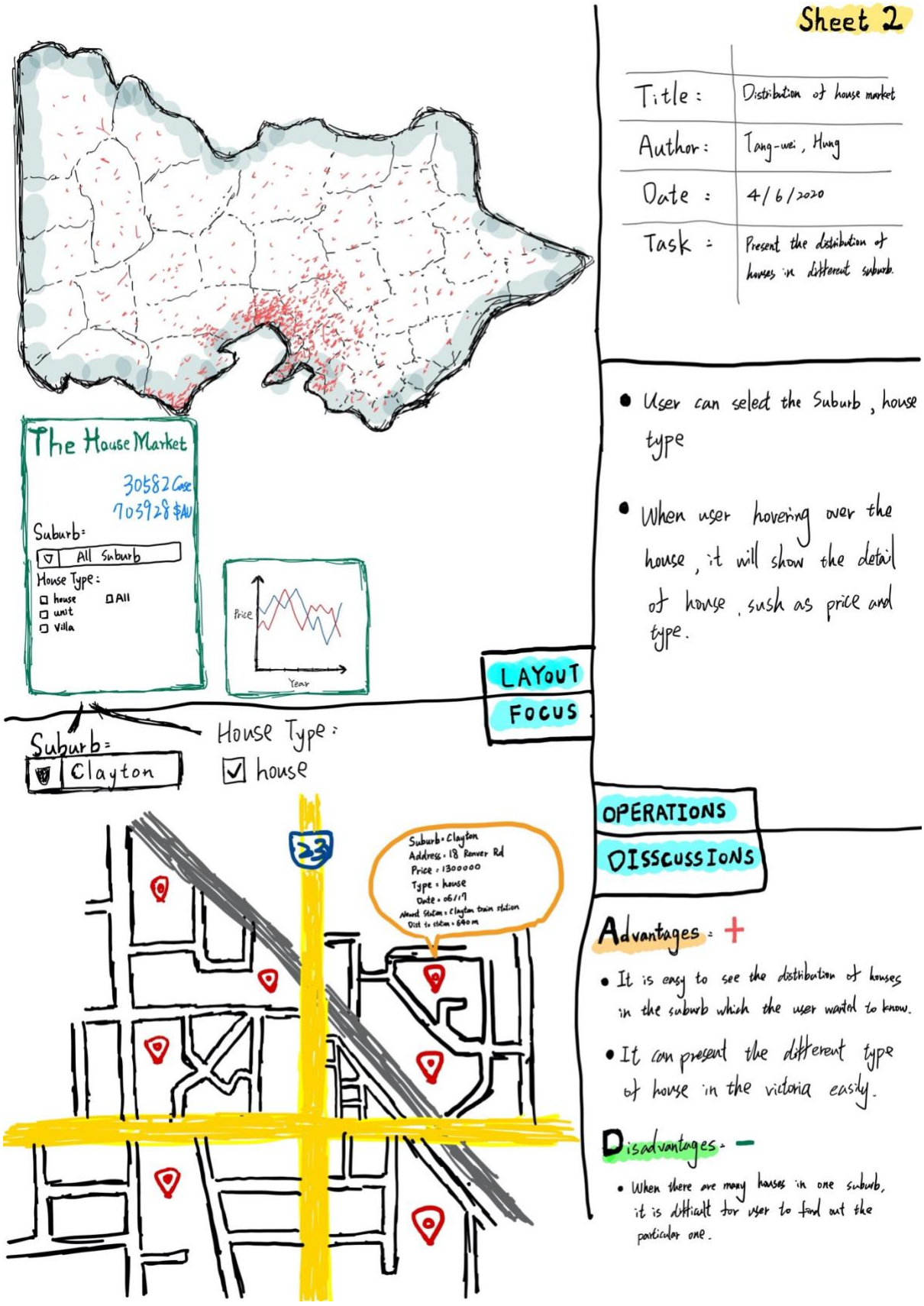
4. Victoria State Boundary (shapefile)
   (URL: https://data.gov.au/data/dataset/vic-suburb-locality-boundaries-psma-administrative-boundaries/resource/4d6ec8bb-1039-4fef-aa58-6a14438f29b1)

APPENDIX

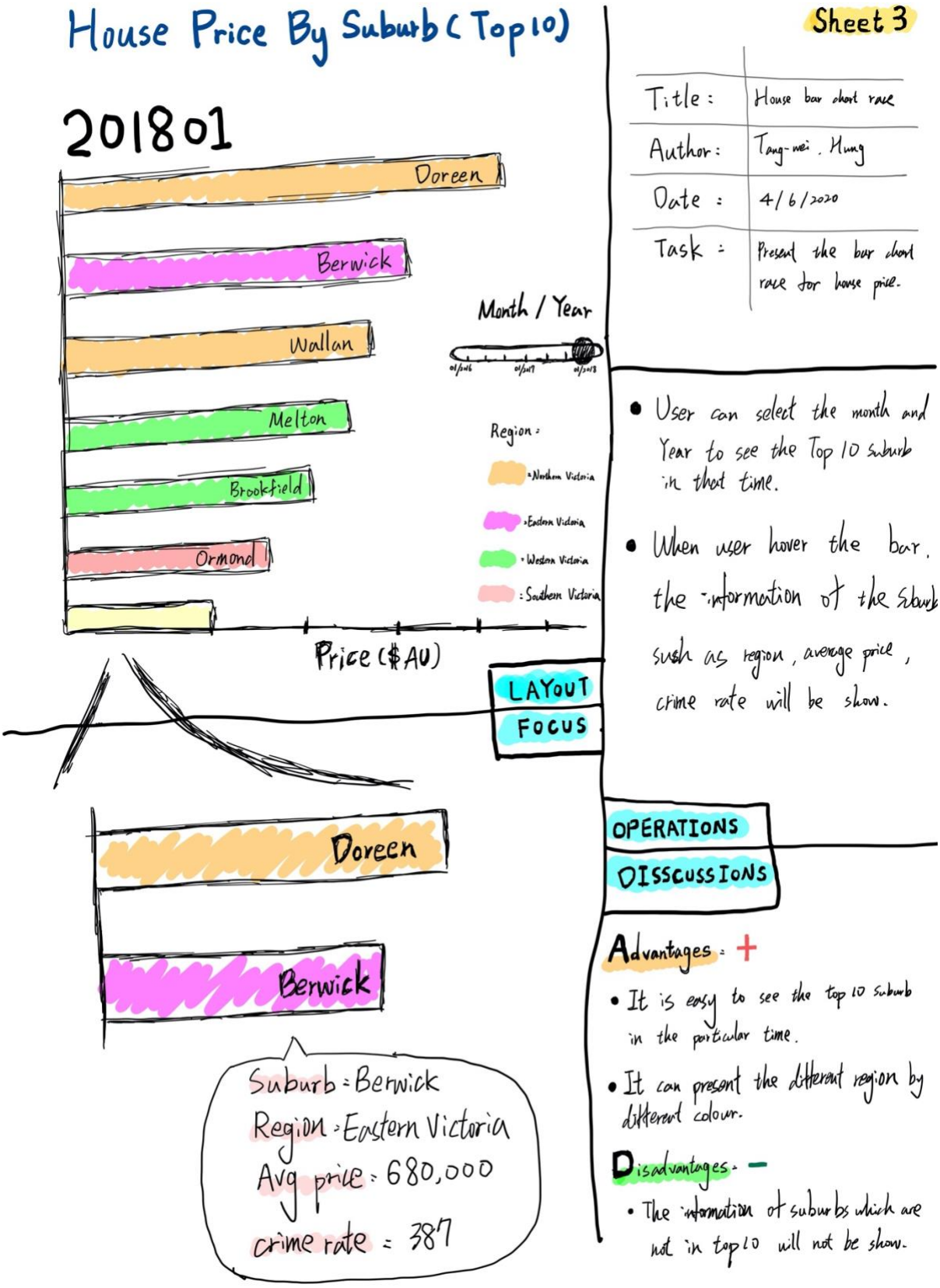
Sheet 1.



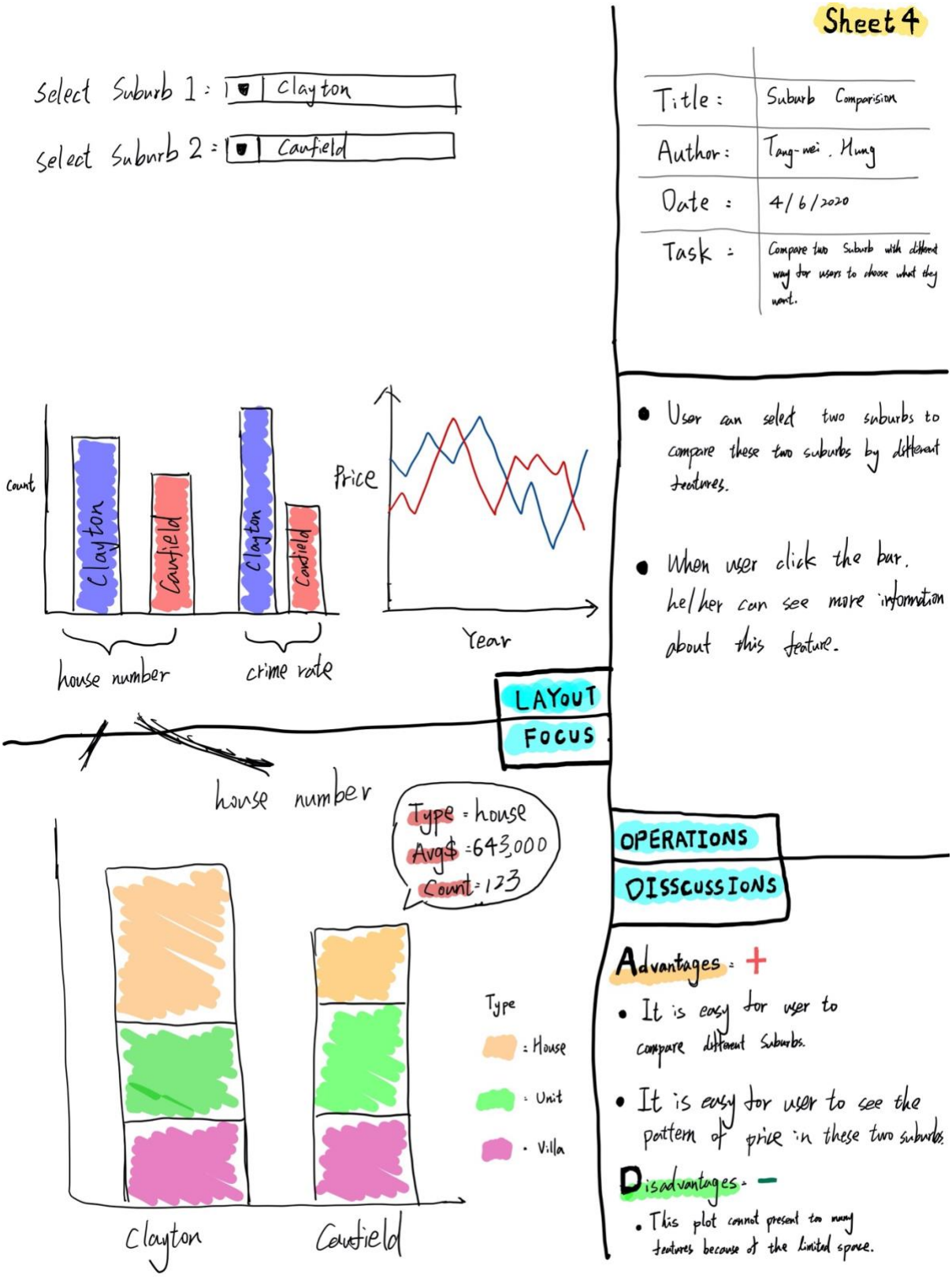
Sheet 2.


Sheet 2
Title : Distribution of house market
Author : Tang-wei, Hung
Date : 4/6/2020
Task : Present the distribution of houses in different suburb.
The House Market
30582 Case
703928 $AU
Suburb:
All Suburb
House Type:
house
unit
villa
All
Price
Year
LAYOUT
FOCUS
User can select the Suburb, house type
When user hovering over the house, it will show the detail of house, sush as price and type.
Suburb:
Clayton
House Type:
house
Suburb: Clayton
Address: 18 Renver Rd
Price: 1300000
Type: house
Date: 06/17
Nearst Station: Clayton train station
Dist to stain: 640 m
OPERATIONS
DISSCUSSIONS
Advantages: +
It is easy to see the distibution of houses in the suburb which the user wanted to know.
It can present the different type of house in the victoria easily.
Disadvantages: -
When there are many houses in one suburb, it is difficult for user to find out the particular one.

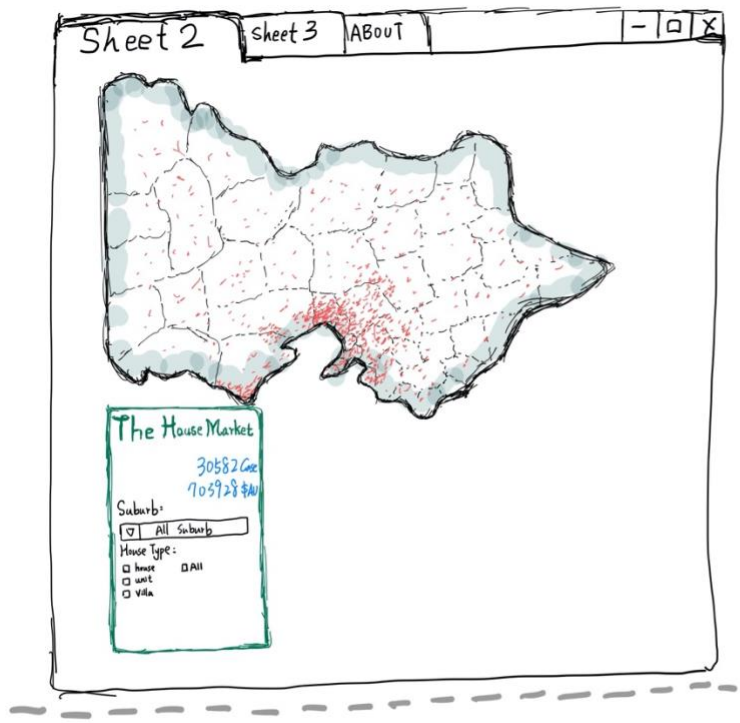
Sheet 3.

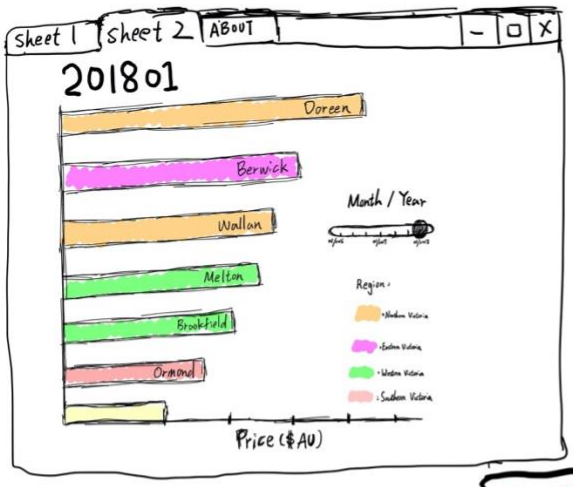

House Price By Suburb (Top10)
201801
Doreen
Berwick
Wallan
Melton
Brookfield
Ormond
Month / Year
Region :
: Northern Victoria
: Eastern Victoria
: Western Victoria
: Southern Victoria
Price ($AU)
Sheet 3
Title : House bar chart race
Author : Tang-wei . Hung
Date : 4/6/2020
Task : Present the bar chart race for house price.
LAYOUT
FOCUS
• User can select the month and Year to see the Top 10 suburb in that time.
• When user hover the bar, the information of the Suburb such as region, average price, crime rate will be show.
Doreen
Berwick
Suburb = Berwick
Region = Eastern Victoria
Avg price = 680,000
crime rate = 387
OPERATIONS
DISSCUSSIONS
Advantages : +
• It is easy to see the top 10 suburb in the particular time.
• It can present the different region by different colour.
Disadvantages : −
• The information of suburbs which are not in top 10 will not be show.

Sheet 4.


Sheet 4
Select Suburb 1 : Clayton
Select Suburb 2 : Caulfield
Title : Suburb Comparision
Author : Tang-wei . Hung
Date : 4/6/2020
Task : Compare two Suburb with different way for users to choose what they want.
Count
Clayton
Caulfield
Clayton
Caulfield
house number
crime rate
Price
Year
• User can select two suburbs to compare these two suburbs by different features.
• When user click the bar, he/her can see more information about this feature.
LAYOUT
FOCUS
house number
Type = house
Avg$ = 643,000
Count = 123
Type
: House
: Unit
: Villa
Clayton
Caulfield
OPERATIONS
DISSCUSSIONS
Advantages : +
• It is easy for user to compare different Suburbs.
• It is easy for user to see the pattern of price in these two suburbs.
Disadvantages : −
• This plot cannot present too many features because of the limited space.

Sheet 5.





Sheet 5

Title:	Realization the design
Author:	Tang-wei. Hung
Date:	4/6/2020
Task:	Present the whole design view

- User can select the suburb
- User can hover the mouse to see more information
- User can select the different year to compare suburbs.

OPERATIONS

DETAIL

- The match = filter and aggregate will be calculated at the beginning when initializing data.
- Dependencies = HTML, CSS, Javascript, D3, shiny, R
- Estimate time needed = More than 2 weeks.

LAYOUT

FOCUS