

A1: Visualization Curation and Analysis

CSE412: Data Visualization

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Part 1: Data Collection & Curation

Screenshots, photos, and/or videos of visualizations that you encounter
in your life with a brief description of each and organized in a principled fashion.

You need at least 10 visualizations for Part 1

Calendar Visualization

3月 2024

週日	週一	週二	週三	週四	週五	週六
25	26	27	28 228 和平紀念日	29	1	2
3	4	5	6	7 No meeting	8	9
10	11	12 415 Final	13	14	15	16 Holiday
17 Holiday	18	19	20	21	22	23
24 Holiday	25	26	27	28	29	30
31	1	2	3	4 兒童節 清明節	5 補休	6

Calendar Visualization

1. Jorte APP

Brief description

It is a chinese calendar app in the phone. It not only records important meeting and class but also presents the image to visualize some activities. What's more, it will automatically shows every chinese holiday with red words.

How does it relate to your life?

I use this calendar app every day. This can help me to remember everything and their time. There are lots of calendar app, but I like this one the most because it shows small cute image which can help me understand what should I do instantly without reading the text.

3月 2024

週日	週一	週二	週三	週四	週五	週六
25	26	27	28 228 和平祭	29	1	2
3	4	5	6	7 No meeti	8	9
10	11	12 415 Final	13	14	15	16 Holiday
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31	1	2	3	4 兒童節 清明節	5 補休	6

Calendar Visualization

2. Smart Sports Center APP

即時人流

	現在人數	容留
游泳池	80	200
健身房	23	60

運動場地 **Type of Sport** [更多 >](#)


羽球


撞球


桌球

場館資訊

-  場館網頁公告 [>](#)
-  收費方式及使用規範 [>](#)
-  每日開館時間 06:00 - 22:00 [▼](#)
-  (02)2820-2880

... 共計 100 人
... 共計 100 人

開始預約 **Start Reservation**

5F 羽球場 01
北投 \$ 300

7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10

2024-01-19

06:00 - 07:00	<input type="radio"/>
07:00 - 08:00	<input type="radio"/>
08:00 - 09:00	<input checked="" type="radio"/>
12:00 - 13:00	<input type="radio"/>
15:00 - 16:00	<input type="radio"/>

Calendar Visualization

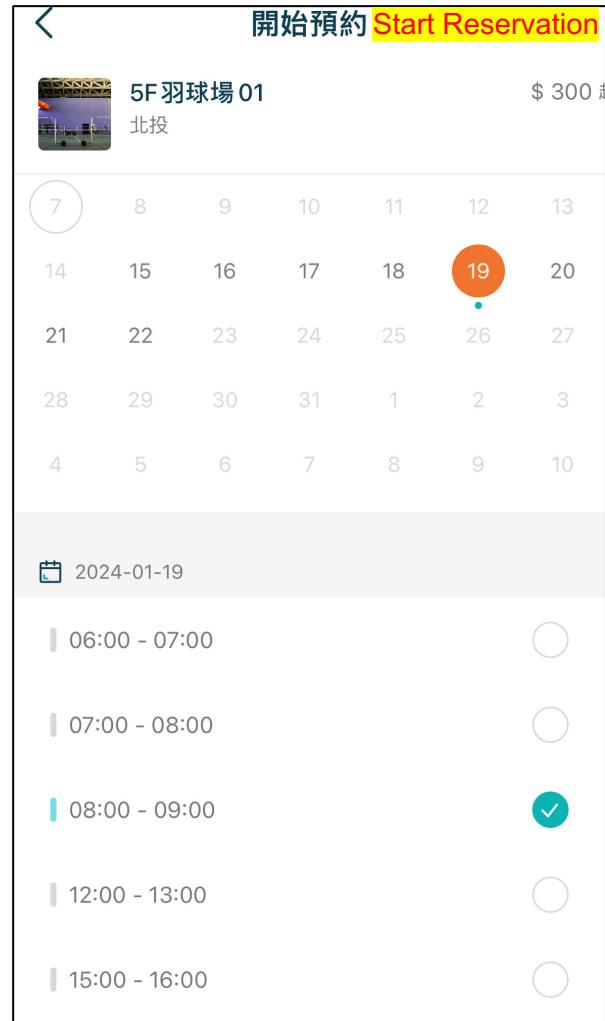
2. Smart Sports Center APP

Brief description

This visualization shows a sport center app in Taiwan. It integrates all sport center in the city. We can use this app to see the type of sport field in every sport center. Also, we can use the built-in calendar to search for all available time and schedule the specific time slot of a field.

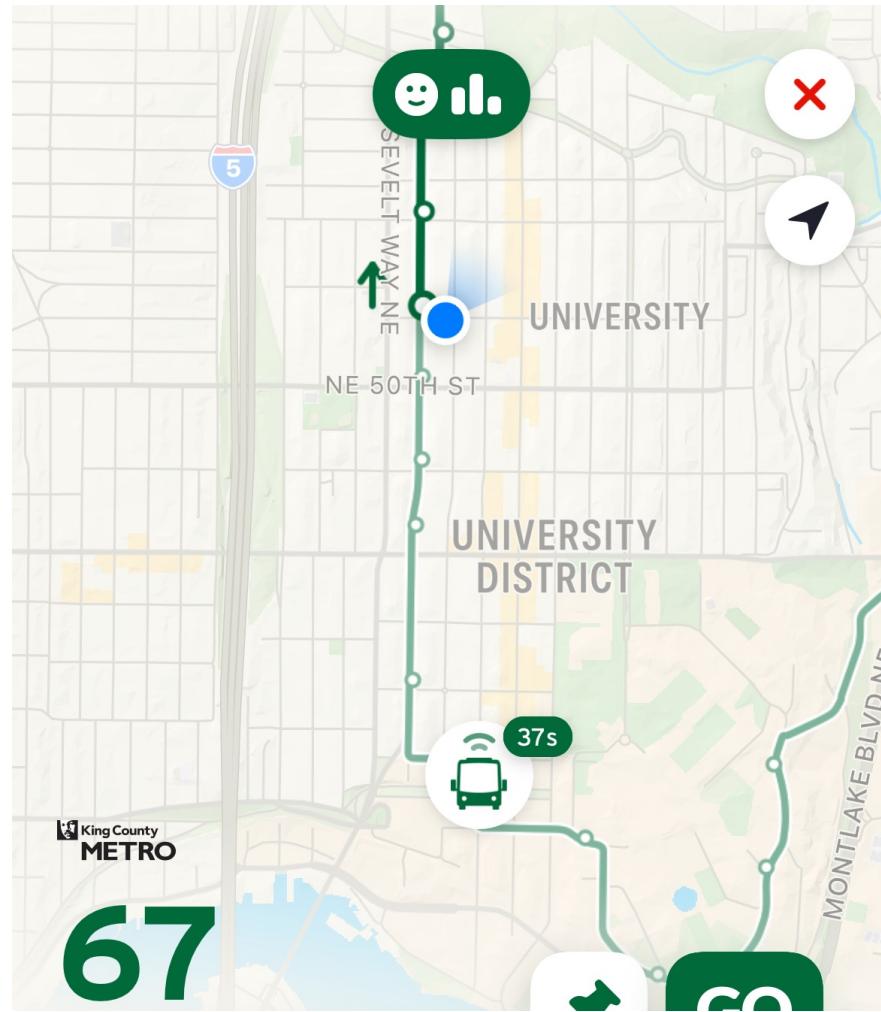
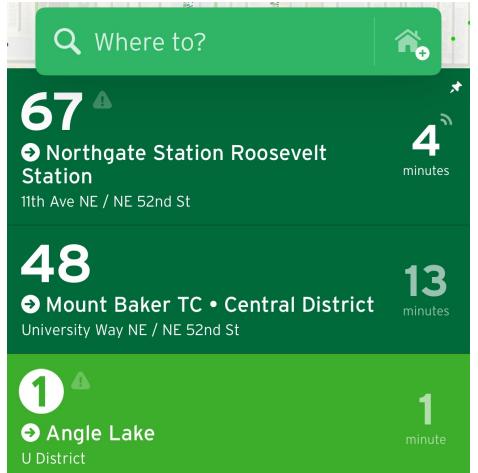
How does it relate to your life?

I really like this integrated system and used it every week last year. With it, I can easily check for all the center to find the badminton field without calling every sport center separately. Its visualization is clear understandable for all age.



Map Visualization

3. Transit APP



Map Visualization

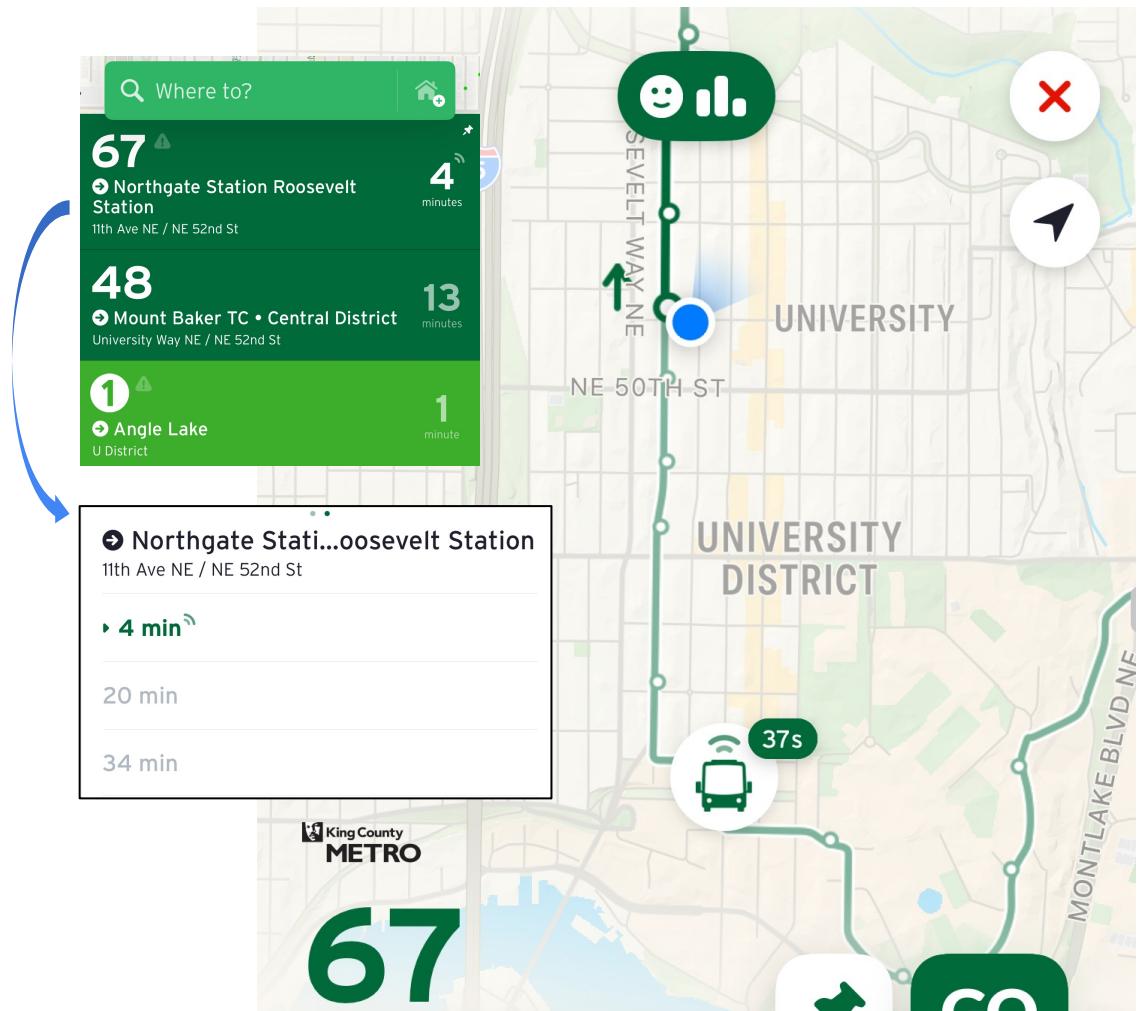
3. Transit APP

Brief description

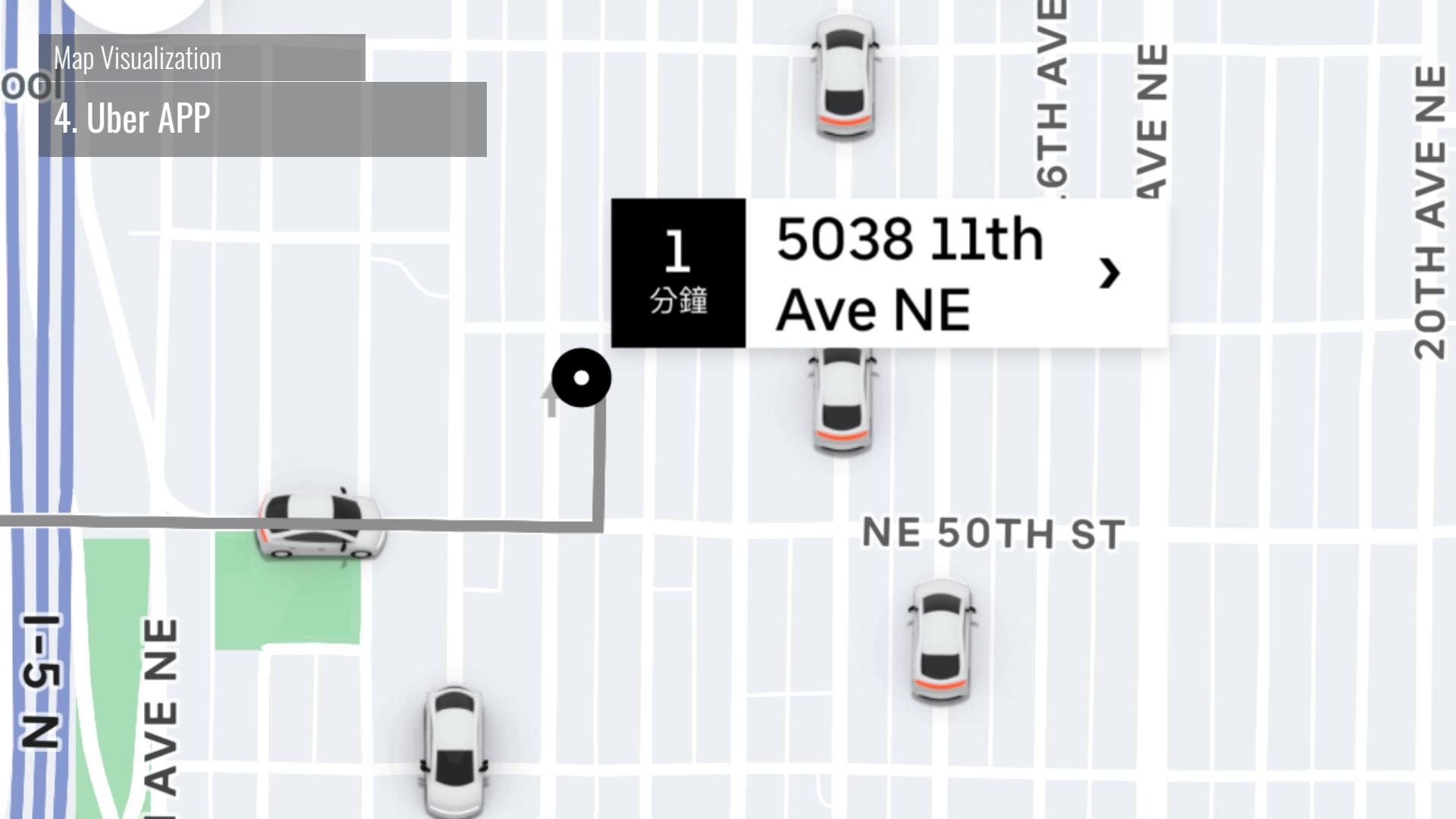
This visualization is extracted from Transit APP. This is an APP for seattle bus information. It can detect the surrounding bus stop and calculate expected time of every bus. Also, we can see the route of the bus and see the location of the next bus.

How does it relate to your life?

When heading to UW, I use this app to check the bus schedule in advance. The visualization of bus route map is very clear for me. It also provides real-time information on how long I'll need to wait for the bus. Therefore, I can efficiently plan my time and avoid unnecessary waiting.



4. Uber APP



Map Visualization

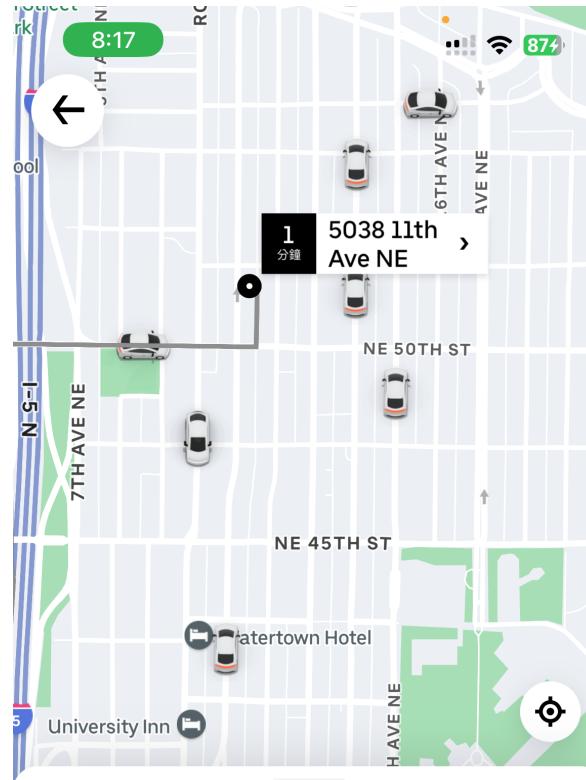
4. Uber APP

Brief description

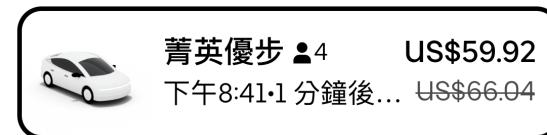
This is a visualization for Uber App. Uber is a platform for booking a ride. After entering destination, it will automatically show all surrounding cars and choose the nearest one. It can also shows the price, number of seats, and the waiting time.

How does it relate to your life?

I like to use Uber APP to book a ride rather than find a taxi on the street recently because Uber APP has a really clear interface. It has shown all the information I need online. And I can know the exact fare before departure, so I don't have to worry about the traffic jam which might make the price become higher.



↓ 價格比平時低 ⓘ



Work Visualization

5. Visual Studio Code

Projects / mesaml-v2

- > .eggs
- > data
- > data_images
- > docs
- ✓ epml
 - > __pycache__
 - > bin
 - > __pycache__
 - ✓ __init__.py
 - ✓ evaluate.py M
 - ✓ train_model_old.py U
 - ✓ train_model.py
 - ✓ view_data.py U
 - > data
 - > __pycache__
 - ✓ __init__.py
 - ✓ aug.py
 - ✓ ekg_mesa_old.py U
 - ✓ ekg_mesa.py
 - ✓ ekg_ptb_crossval.py
- ✓ OUTLINE

No symbols found in document 'train_model.py'

train_model.py X evaluate.py M models.py M parse_results.py U \$ sweep_VT_exp12.slurm U

cardss [SSH: kclone.hyak.uw.edu]

```
i > Projects > mesaml-v2 > epml > bin > train_model.py
from sklearn.metrics import roc_curve, auc
from epml import utils
from epml.bin.evaluate import evaluate_testset, plot_multiclass_roc, plot_PCA
from scipy import interp
from itertools import cycle
from epml.data.ekg_ptb import EKG_ptb
from keras.backend.tensorflow_backend import set_session
config = tf.compat.v1.ConfigProto()
config.gpu_options.per_process_gpu_memory_fraction = 0.8 #modify the fraction if cuDNN failed
tf.keras.backend.set_session(tf.Session(config=config))

def train_pipeline(
    k_fold,
    n_epoch,
    batch_size,
    model_name,
    model_kwargs,
    loss,
    patience,
    optimizer_name,
    optimizer_kwargs,
    save_dir,
    x_train,
    y_train,
    x_val,
    y_val
):
    ...
    ...

Pipeline to train a model. Useful to train a fold in kfold validation

Parameters
- model_name
- model_kwargs
```

2K+ 1

Work Visualization

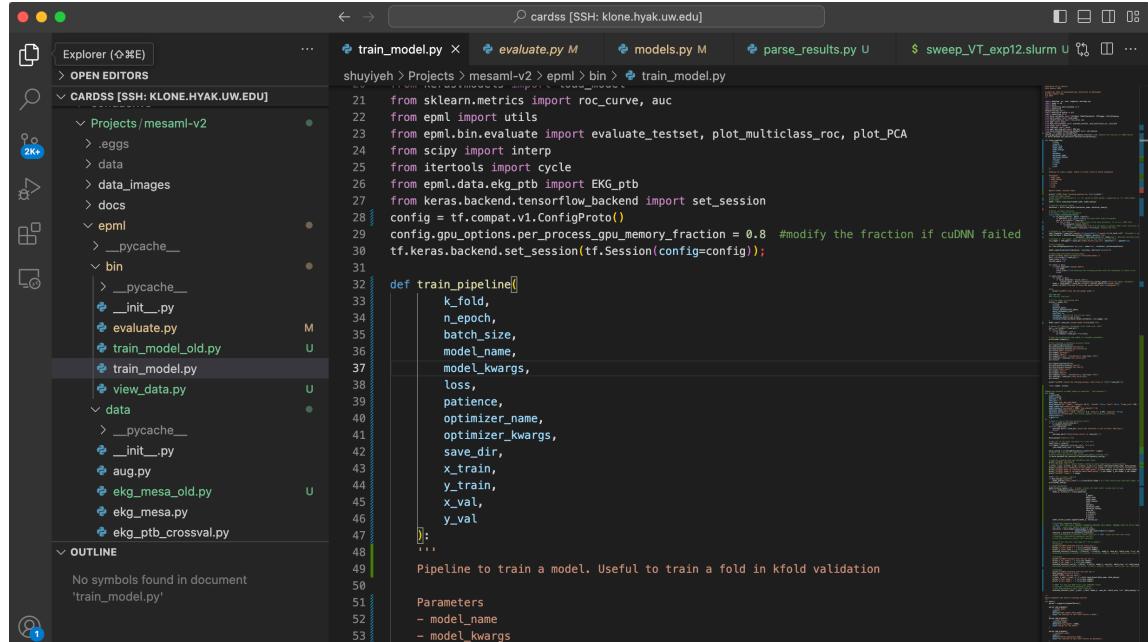
5. Visual Studio Code

Brief description

This visualization is a streamlined code editor, Visual Studio Code. It supports multiple programming languages. It utilizes syntax highlighting, displaying code in different colors based on its type. For example, words with orange color mean comment and words with blue color mean attribute. This syntax highlighting can help people understand the code much faster.

How does it relate to your life?

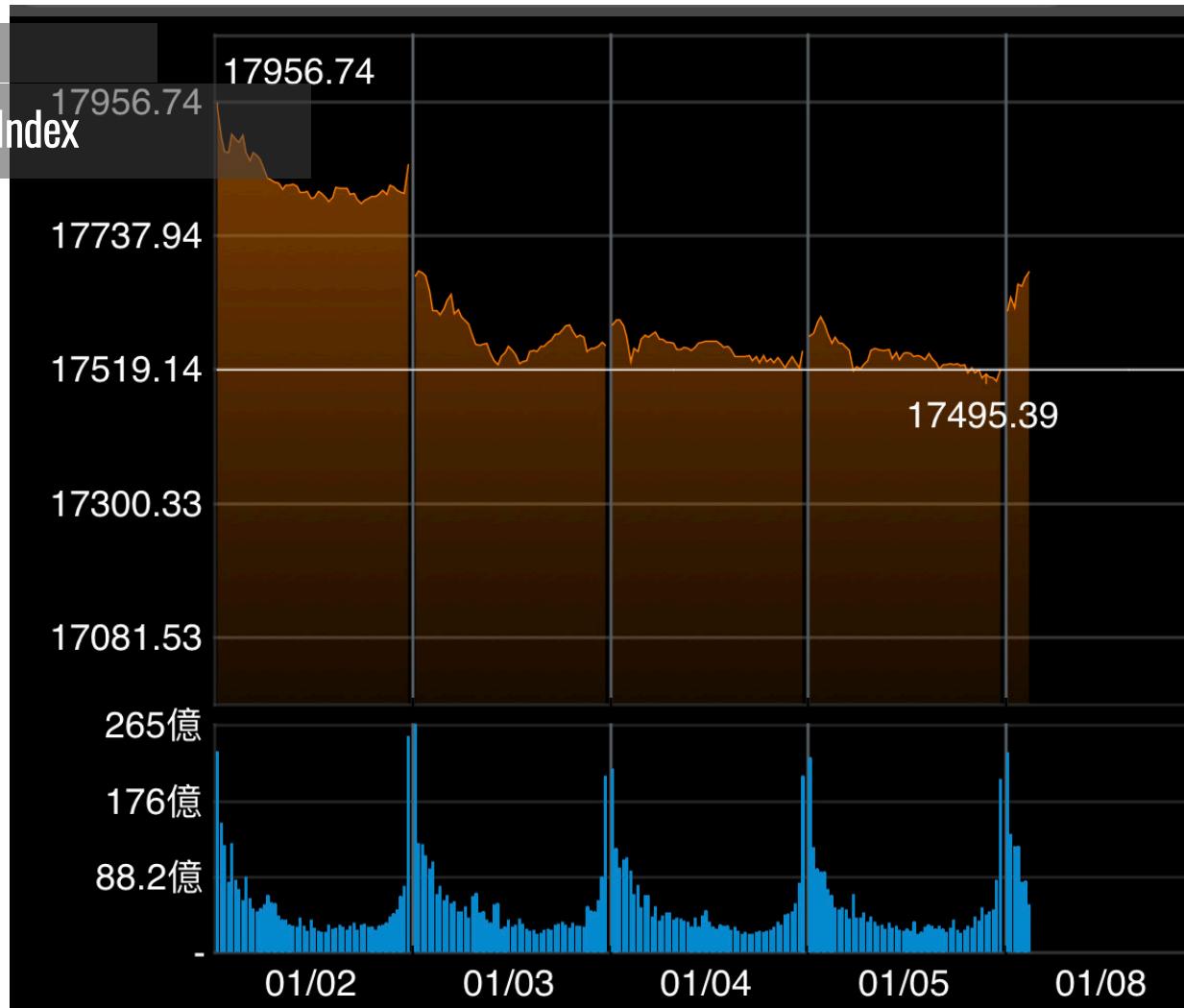
I use Visual Studio Code really often in the lab and course. Its clear visualization can help me familiar with a new programming language more easily.



A screenshot of the Visual Studio Code interface. The left sidebar shows a file tree for a project named 'mesaml-v2'. The 'bin' folder contains several Python files: '_init_.py', 'evaluate.py', 'train_model.py', 'train_model_old.py', and 'view_data.py'. The 'train_model.py' file is currently open in the main editor area. The code uses syntax highlighting: orange for comments (e.g., `# modify the fraction if cuDNN failed`), blue for attributes (e.g., `tf.compat.v1.ConfigProto`), and black for standard text. The code defines a function `train_pipeline` which takes parameters like `k_fold`, `n_epoch`, etc., and returns a pipeline object. A status bar at the bottom indicates 'No symbols found in document' and 'train_model.py'.

```
shuyiyeh > Projects > mesaml-v2 > epml > bin > train_model.py
21 from sklearn.metrics import roc_curve, auc
22 from epml import utils
23 from epml.bin.evaluate import evaluate_testset, plot_multiclass_roc, plot_PCA
24 from scipy import interp
25 from itertools import cycle
26 from epml.data.ekg_ptb import EKG_ptb
27 from keras.backend.tensorflow_backend import set_session
28 config = tf.compat.v1.ConfigProto()
29 config.gpu_options.per_process_gpu_memory_fraction = 0.8 #modify the fraction if cuDNN failed
30 tf.keras.backend.set_session(tf.Session(config=config));
31
32 def train_pipeline(
33     k_fold,
34     n_epoch,
35     batch_size,
36     model_name,
37     model_kwargs,
38     loss,
39     patience,
40     optimizer_name,
41     optimizer_kwargs,
42     save_dir,
43     x_train,
44     y_train,
45     x_val,
46     y_val
47 );
48 ...
49 Pipeline to train a model. Useful to train a fold in kfold validation
50
51 Parameters
52 - model_name
53 - model_kwargs
```

6. Stock Price Index



Work Visualization

6. Stock Price Index

Brief description

This is visualization for stock price index for the current week. We can understand the trend of the index by observing the line chart. Additionally, the bar chart illustrates the daily trading volume, providing further insight into market activity.

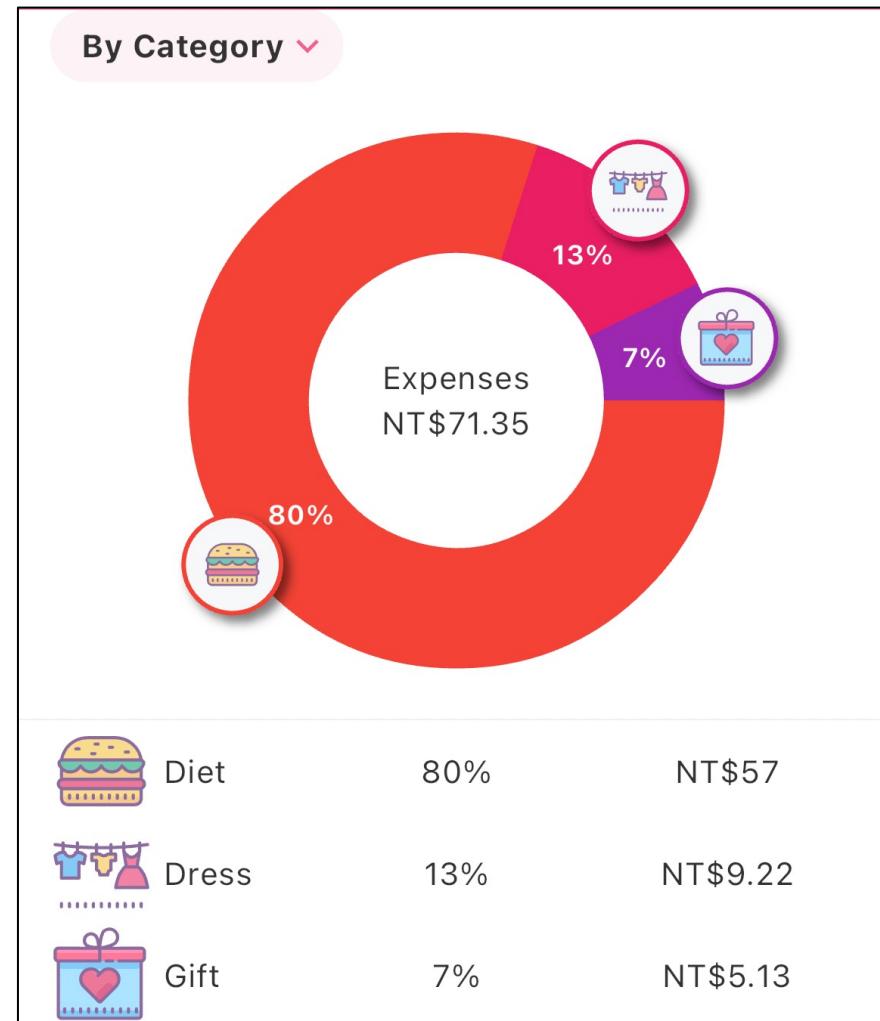
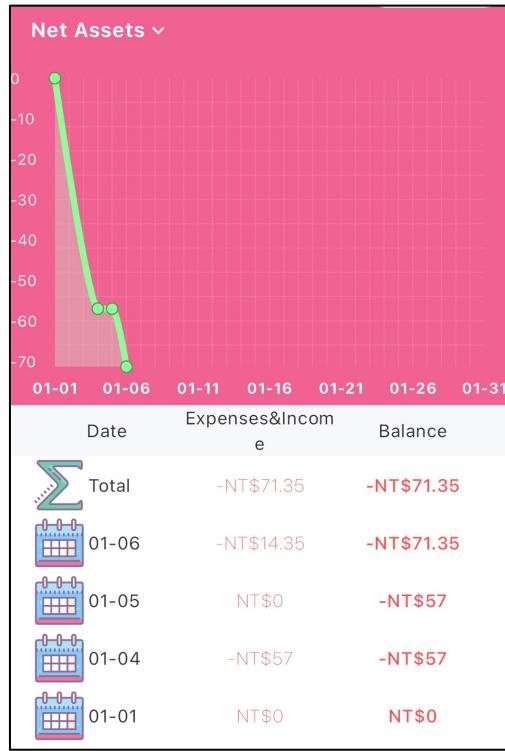
How does it relate to your life?

Since I also hold a few stocks, by observing the trend in stock prices and trading volume, I can predict the optimal moments for buying and selling. What's more, it can also help me learn risk management.



Record Visualization

7. Money+ APP



Record Visualization

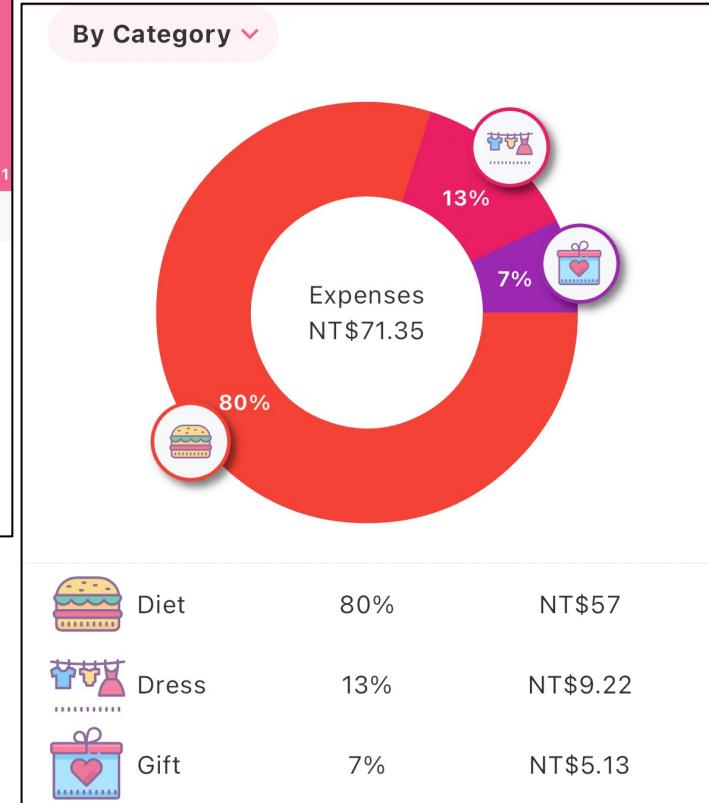
7. Money+ APP

Brief description

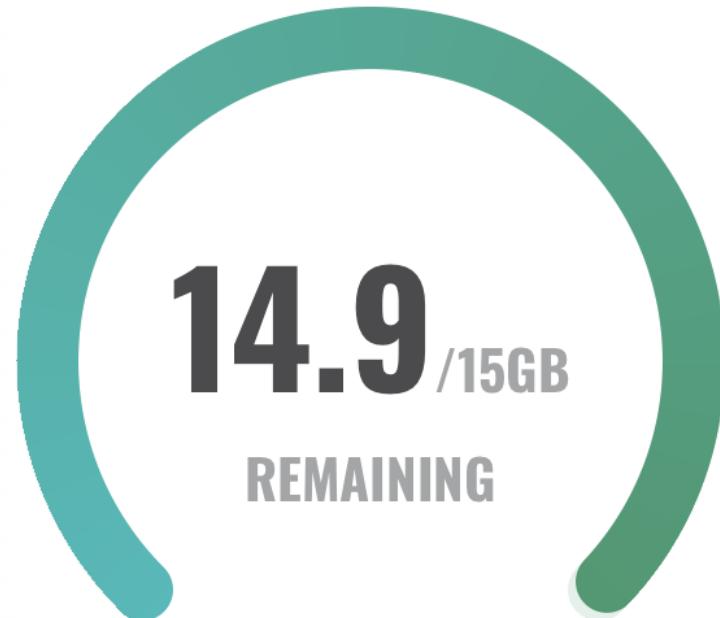
These visualizations are generated by an app designed for tracking daily expenses. Upon recording expenses, the app creates a pie chart to show the percentage of expense from different category. In addition, it will also provide a line chart to show the the daily spending trends.

How does it relate to your life?

This is a new APP I just started to utilize to track my expense. The advantage of this app is its style. The visualization is very cute and understandable. While other app just record the income and expense with number, it presents them in a more readable way.



Welcome back ShuYi



Data renews in 27 days

8. Mint Mobile APP

Brief description

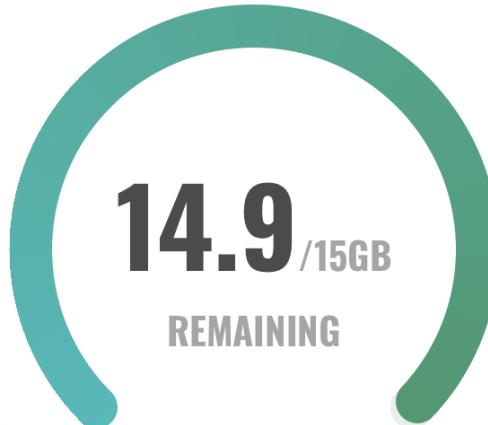
This visualization is a screenshot from Mint Mobile App. Mint Mobile is a company which provides lots of wireless plan for internet. Its APP on the phone shows remaining data every month.

How does it relate to your life?

By downloading this APP, I can monitor how many data left in this month. As a result, I can manage my internet usage effectively, avoiding the situation of running out of data in advance. I can also prevent potential emergencies.

Month 2 of 12 | 15GB/mo Plan

Welcome back ShuYi



Data renews in 27 days



9. Dream Town



訂單詳情



128



112



3/1

9/1

2/1

1/1

0/1



傳送

9. Dream Town

Brief description

Dream Town is a game which ask player to build a small town by themselves. Player has to build factories and farm, creating various kind of food to meet villager's need. After earning money, the town will grow and expand. This visualization shows all villager position and their orders. We can see the list at the right side to invent what they want.

How does it relate to your life?

I play this farming game when I'm free. Playing this game gives me a sense of achievement because I can expand and enrich my virtual world when making effort on it.



10. Arena of Valor

美味收集卡

美味對戰送

聖誕禮物

2



完成任務就送你聖誕禮物



5



20



12/23

10

每日參加對戰0/1場



1

去完成



1

每日對戰獲勝0/1場

去完成



已領取

10. Arena of Valor

Brief description

This visualization is from a game named Arena of Valor. It is a multiplayer online battle game on the cellphone. The image depicts a collection bar that can be filled by completing various tasks. Once the bar is filled, a big reward can be obtained.

How does it relate to your life?

I used to play Arena of Valor before. It is an exciting activity with friends. The collection bar adds an extra motivation as completing tasks because it not only contributes to the progress of the game but also leads to valuable rewards.

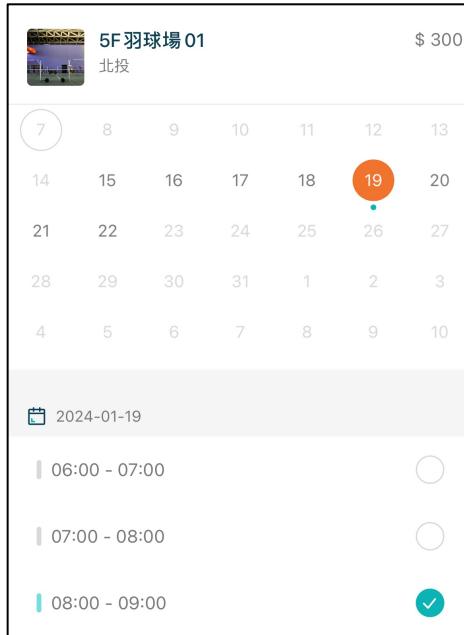


Part 2: Visualization Critique

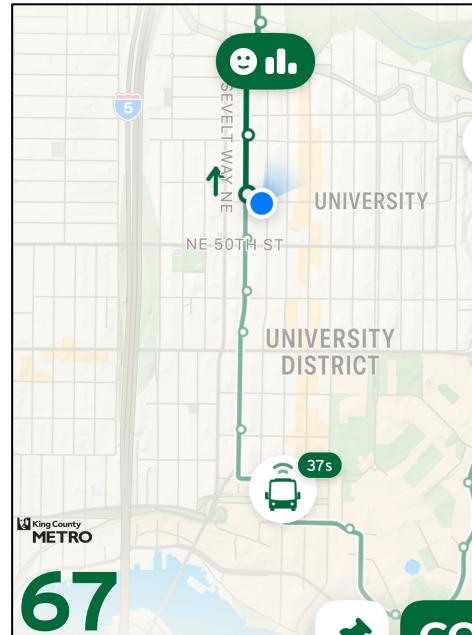
Select three visualization from your curated set to analyze and critique them.

Selected Visualizations For Critique

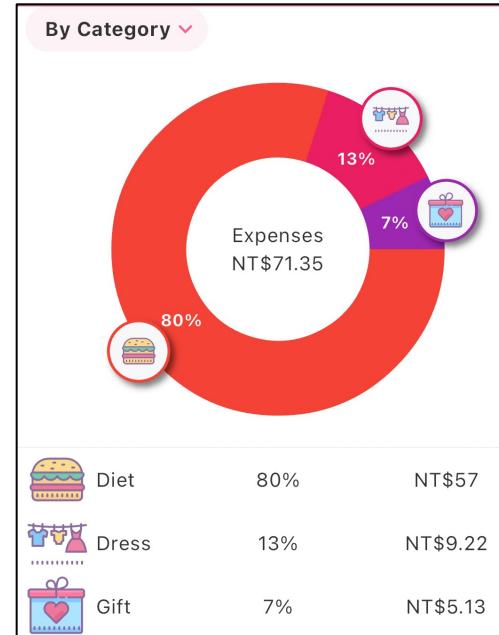
I selected these three visualizations because they are all practical APPs on my phone. They represents different categories: Calendar visualization, Map visualization, and Record visualization, respectively. Their visualization effect are very attractive and understandable.



Smart Sports Center App



Transit App



Money+ App

Calendar Visualization

2. Smart Sports Center APP

Maximum visitors

Real-time number of visitors



Type of Sports:
We can see
available type of
sport field in a
sport center

Open hours and
phone number:
necessary
information



2024-01-19

06:00 - 07:00

07:00 - 08:00

08:00 - 09:00

12:00 - 13:00

15:00 - 16:00

已選擇 1 個時段

\$300

下一步

Time slot: After choosing a day, it shows remaining time slot for reservation

Calendar Visualization

2. Smart Sports Center APP CRITIQUE

What is the goal of this visualization?

This visualization is intended to provide a way of reservation for people who want to book a sport field. By using this integrated APP, they can search for available field and time slot more easily.

How is the data represented—its visual encoding, graphical marks, color, etc.?

It shows data in a calendar form. Dates with black color mean they are available now, while dates with gray color mean they cannot be booked. The time slot below are all selectable, when selecting, it will shows a green checkmark and its price below.

What are some key strengths of this visualization and why?

- Its format of calendar can let people schedule their time more efficiently.
- The date, time slot, and price are both shown in the same page. It is very readable.

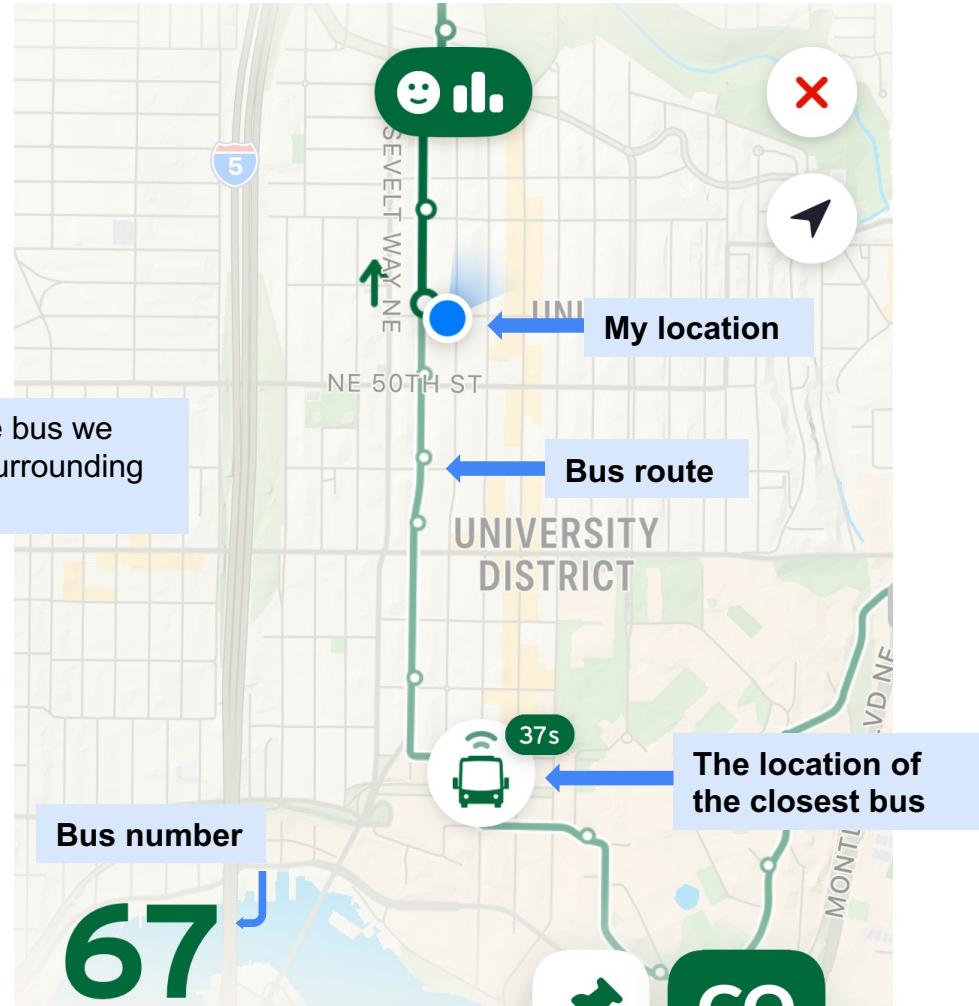
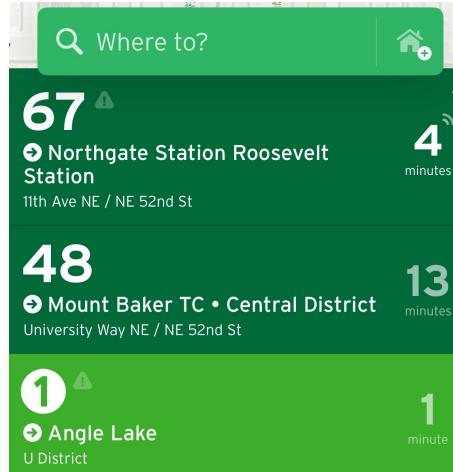
What are some key weaknesses of this visualization and why?

- The time with black sometimes shows no time slot below. If there is no field left in a day, marking it with gray color will be better.
- We need to click every day to check the suitable time slot. It will be better to create a function to filter the specific time slot in the whole week.

The image shows a mobile application interface for booking a sports field. At the top, there's a header with a small thumbnail of a basketball court and the text "5F 羽球場 01" and "北投". To the right of the header is a price of "\$ 300". Below the header is a weekly calendar grid from Monday to Sunday. The days are numbered 1 through 7. The 19th of January is highlighted with a red circle and a green checkmark, indicating it is selected. Below the calendar, a date selector shows "2024-01-19". Underneath the date are several time slot options: "06:00 - 07:00", "07:00 - 08:00", "08:00 - 09:00", "12:00 - 13:00", and "15:00 - 16:00". The "08:00 - 09:00" slot has a green checkmark next to it. At the bottom, a teal button says "已選擇 1 個時段 \$ 300" and "下一步".

Map Visualization

3. Transit APP



3. Transit APP

What is the goal of this visualization?

This visualization is intended to provide people information of real-time bus location and waiting time in Seattle. By using Transit, we can know following bus and find the fastest way to arrive the destination.

How is the data represented—its visual encoding, graphical marks, color, etc.?

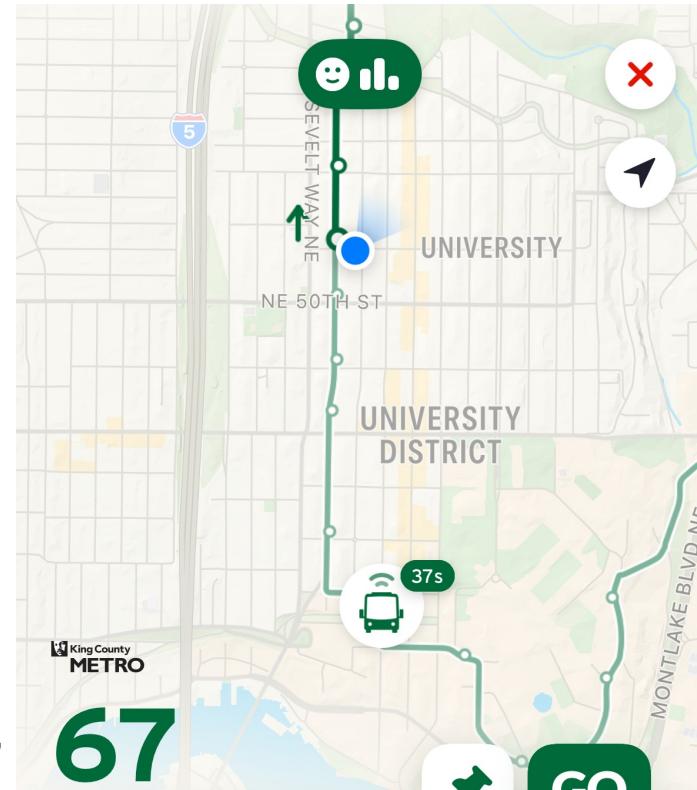
It shows data in a map format. It shows a bus route in the map and especially highlight the direction with dark green. There is a bus mark which gives us precise location of the bus, rather than just showing the time only.

What are some key strengths of this visualization and why?

- The arrow to show the direction can prevent people from taking the opposite direction bus.
- It also shows user location in the same map, which make us realize the relative position more easily.

What are some key weaknesses of this visualization and why?

- The color of the whole page are mostly green. Although it's more beautiful, it might not be readable for elderly.
- The time close to bus mark might mislead users. It means the time after the last update. But users might not know its meaning without explaining.



Record Visualization

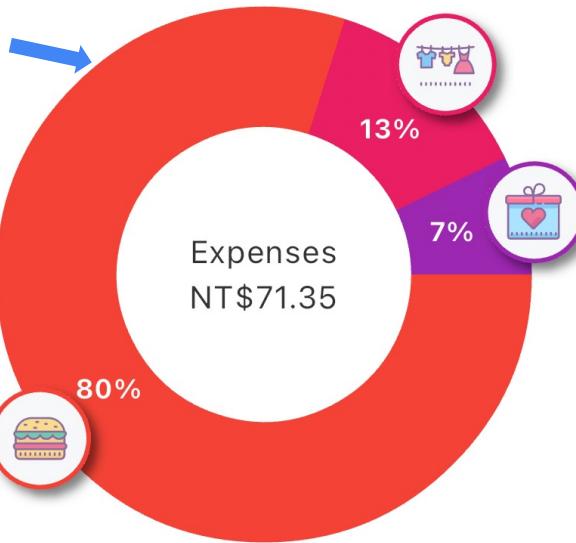
7. Money+ APP



Expense list: expenses every day and the total value

By Category ▾

Pie chart: It shows the percentage of expenses from different categories



	Diet	80%	NT\$57
	Dress	13%	NT\$9.22
	Gift	7%	NT\$5.13

Detailed list

7. Money+ APP

What is the goal of this visualization?

The goal of these visualizations are to help people record daily expense with a more explicit chart. It can help people see the trend of spending money and realize which category they spend the most.

How is the data represented—its visual encoding, graphical marks, color, etc.?

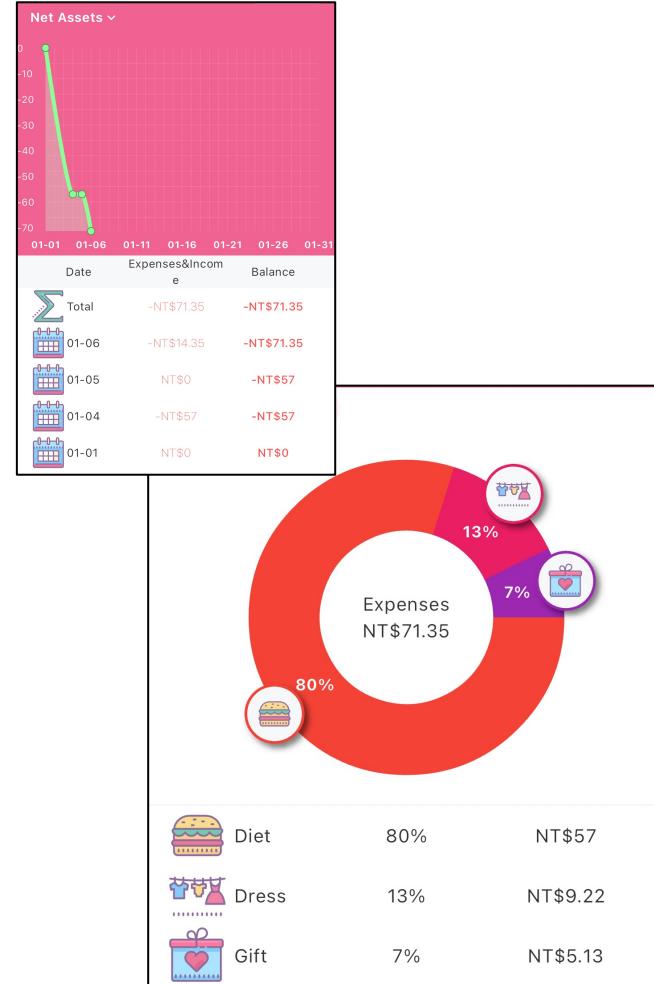
It shows data in two format: pie chart and line chart. It not only display the percentage on the pie chart but also use small schema to represent different categories. As for the line chart, it use green line to indicate the change of expense.

What are some key strengths of this visualization and why?

- The color of two figures are both bright and have contrast against background.
- Small schema strengthen the characteristic of this APP, making it cuter and more attractive.

What are some key weaknesses of this visualization and why?

- The line chart shows the trend of this month only, but I think it will be more effective to show recent 30 days rather than start with the first day of the month.
- Users can only record the expense with categories. If the expense records are based on shop names rather than categories, the pie chart would become very chaotic.



Learning reflection

In this assignment, I've observed that visualization is present everywhere. In my daily life, I encounter visualization in almost every APP, ranging from gaming to professional tools. This is what I didn't notice before. After analyzing them, I realize that good visualization plays an vital role in users' choice when selecting apps or devices. For example, when there are numerous calendars options with similar function, users tend to consider factors like color and style, choosing the most understandable one.

Furthermore, I learn to critique the strength and weakness of every visualization. I realize that color contrast in a chart is really important. And I also learn various methods to integrate concise texts and graphics, making it easier to convey detailed information to users. Although visualization is still a profound field, I think I have gain more insight into it now.