

Web application for Data visualization of Travel Time Reliability

P R E S E N T A T I O N

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TABLE OF CONTENTS

- 1 Introduction
- 2 Theoretical framework
- 3 Methods and Procedures
- 4 Results and discussions
- 5 Conclusions and recommendation

1

Introduction



loading 20% ...

Pain Points:



**Being late for
an appointment**



**Having too much free
time before an
appointment**



**Missing an
opportunity**

Objective 1

To schedule any appointment time from daily to weekly



Objective 2

To display planning time index which helps users to get the appointment on time.



Objective 3

To visualize travel time reliability which helps users chosen the best way.



Scope of Research

Rama IV Rd. and the intersection of Rama IV Rd.



DATA 1
2019

DATA 2
2020

DATA 3
2021

Advantages 1

Users are able to go to any appointments on time.



Advantages 2

Users are able to plan the travel time accurately.

Advantages 3

Users can use it conveniently and easily understand for choosing the best way



2

Theoretical Framework



loading 40% ...

Design Thinking



Empathize



Define



Ideate



Prototype



Test

Competitor Analysis



Direct competitor



Indirect competitor



Replacement Competitor

Customer Journey



Awareness



Consideration



Decision



Retention



Loyalty

Theory

- Planning time index เป็นการคำนวณเวลาทั้งหมดที่ใช้ในการเดินทาง โดยมีวิธีการคิดคือนำ 95th percentile ของ travel time มาหารด้วย free-flow travel time ตามสูตรดังนี้

$$PTI = \frac{\text{Travel Time}_{95\text{th percentile}}}{\text{Free Flow Travel Time}}$$

- Travel time index เป็นการหาอัตราส่วนระหว่างค่าเฉลี่ยของ Travel time กับ free-flow travel คำนวณตามสูตรดังนี้

$$TTI = \frac{\text{Average Travel Time}}{\text{Free Flow Travel Time}}$$

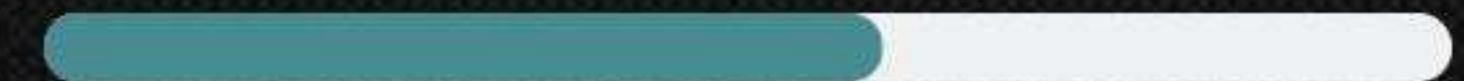
Theory

- 1 Travel time
- 2 Planning time
- 3 Buffer time



3

Methods and Procedures



loading 60% ...

User Experience design process



Empathize

Define

Ideate

Prototype

Test



Empathize

“ Traffic is a significant concern when it comes to travelling, especially in Bangkok. The unpredictability of travel times can greatly impact daily life, causing travellers such delays sometimes more than necessary. ”



Empathize

1

Competitor analysis

2

Feature analysis

3

User research

Direct Competitor

Indirect Competitor

Competitor analysis

Direct Competitor

Google Maps

Strength:

- Able to plan departure and arrival time in advance at any time.
- Accurate and up-to-date information
- Report about traffic issues
- Display multiple destinations

Weakness:

- Overwhelming user interfaces for some user
- Limited offline functions

Apple Maps

Strength:

- Able to plan departure and arrival time in advance for 15 days.
- Ease use for IOS users
- Real-time traffic information, including congestion, accidents, etc.
- Ask Siri for directions

Weakness:

- Outdated information
- Misplaced landmarks

Competitor analysis

Indirect Competitor

Grab Driver

Strength:

- Estimated charge and travel time after booking.
- Advanced booking up to 7 days
- A double drop-off option

Weakness:

- Limited availability in certain areas

LINE MAN

Strength:

- Estimated travel time after booking
- Real-time tracking
- Finding a taxi quickly, even during peak hours

Weakness:

- Unable to plan a trip in advance

BOLT

Strength:

- User-friendly interface, easy for users to book rides
- Affordable price

Weakness:

- Problems with payment processing

Feature analysis

Features	Google Maps	Apple Maps	Grab Driver	LINE MAN	BOLT
Set directions	✓	✓	✓	✓	✓
Set a time and date	✓	✓	✓	✗	✗
Set route options	✓	✓	✗	✗	✗
Location information	✓	✓	✓	✗	✗
Report traffic issues	✓	✓	✗	✗	✗
Measure distances	✓	✓	✓	✓	✓
Estimated travel time	✓	✓	✓	✓	✓
Saved places	✓	✓	✓	✗	✗
Add stop	✓	✓	✓	✗	✗
Navigation	✓	✓	✓	✓	✓
Notification	✓	✓	✓	✓	✓
Extra time	✗	✗	✗	✗	✗

3

User Research

According to the research, We chose

“area outsiders/first-timers”

as the target users which I found to be most impactful.



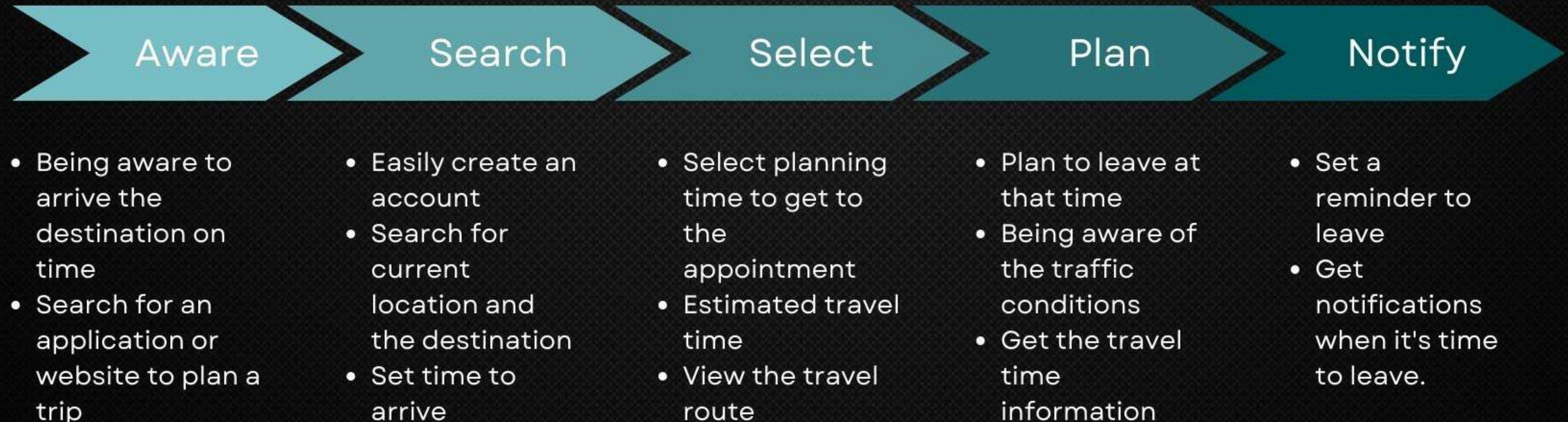
Define

“ We focused on solving travel time planning issues in daily life by using the application to plan travel time in advance. The application displayed total travel time estimation data and the reliability of travel time in graphs to help users make informed decision.

”

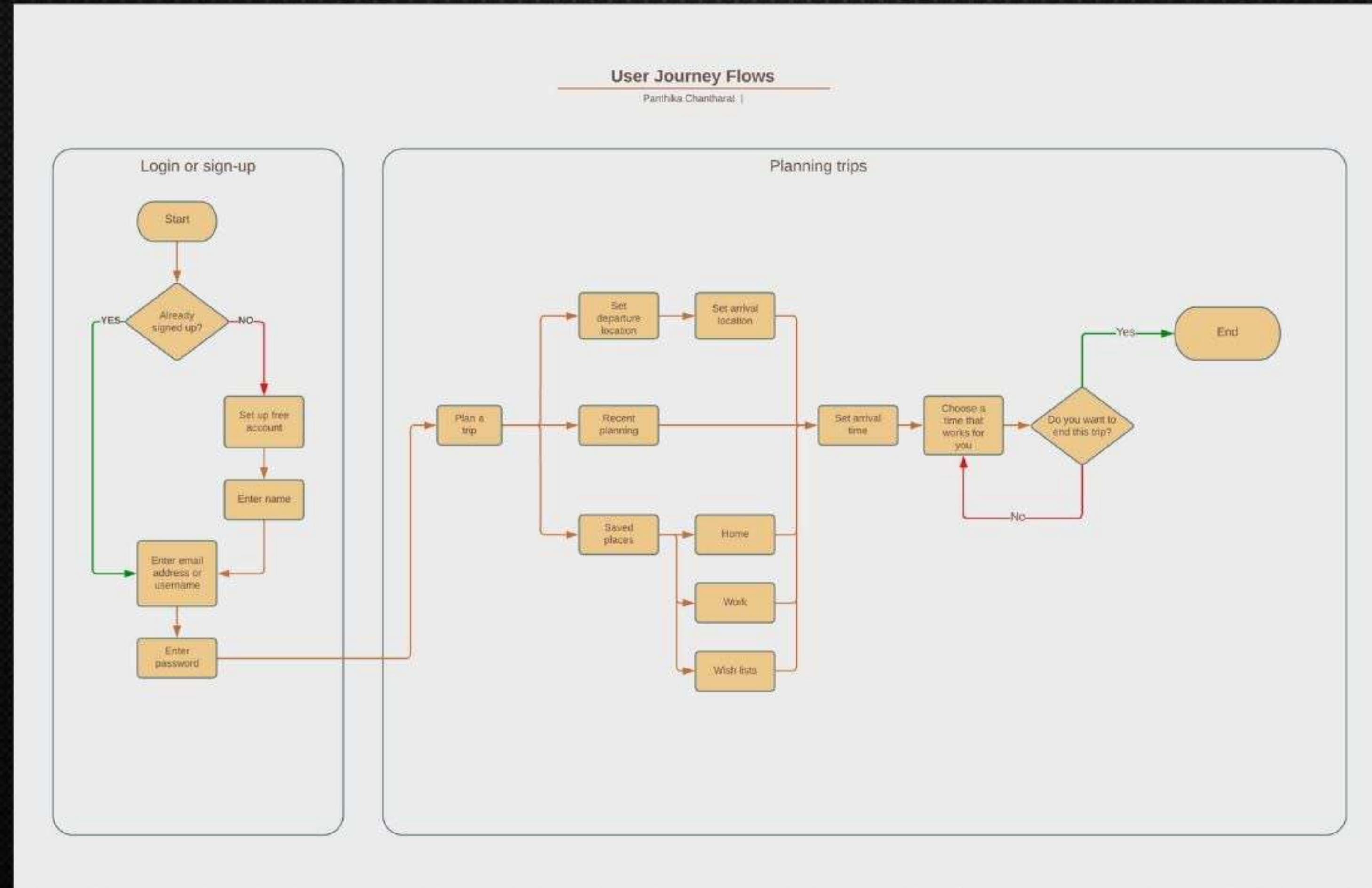


Customer Journey





Ideate — User Flow





Ideate — Sampling Size

Group A
 $n = 6$

Test prototype A

Group B
 $n = 6$

Test prototype B



Prototype

The image displays two sets of mobile application screens, Prototype A on the left and Prototype B on the right, side-by-side for comparison.

Prototype A (Left):

- Planning your time:** Shows a form to input departure and arrival times, with a "Done" button at the bottom.
- Recent planning:** Lists recent trips from "Lumpini Park" to "Queen Sirikit Center".
- Saved places:** Icons for Home, Work, Saved, and Fave.
- Map:** A map showing the route from "Sanyan Mittown" to "Queen Sirikit Center" with a travel time of 38 mins.
- Bottom message:** "Choose the appropriate time for you!"

Prototype B (Right):

- Planning your time:** Shows a form to input departure and arrival times, with a "Done" button at the bottom.
- Recent planning:** Lists recent trips from "Lumpini Park" to "Queen Sirikit Center".
- Saved places:** Icons for Home, Work, Saved, and Fave.
- Map:** A map showing the route from "Sanyan Mittown" to "Queen Sirikit Center" with a travel time of 38 mins.
- Top message:** "10:07 → 11:00 Sanyan Mittown Queen Sirikit Center Your trip 53 mins Travel time 38 mins Leaving time 37 mins"
- Bottom message:** "Choose the appropriate time for you!"

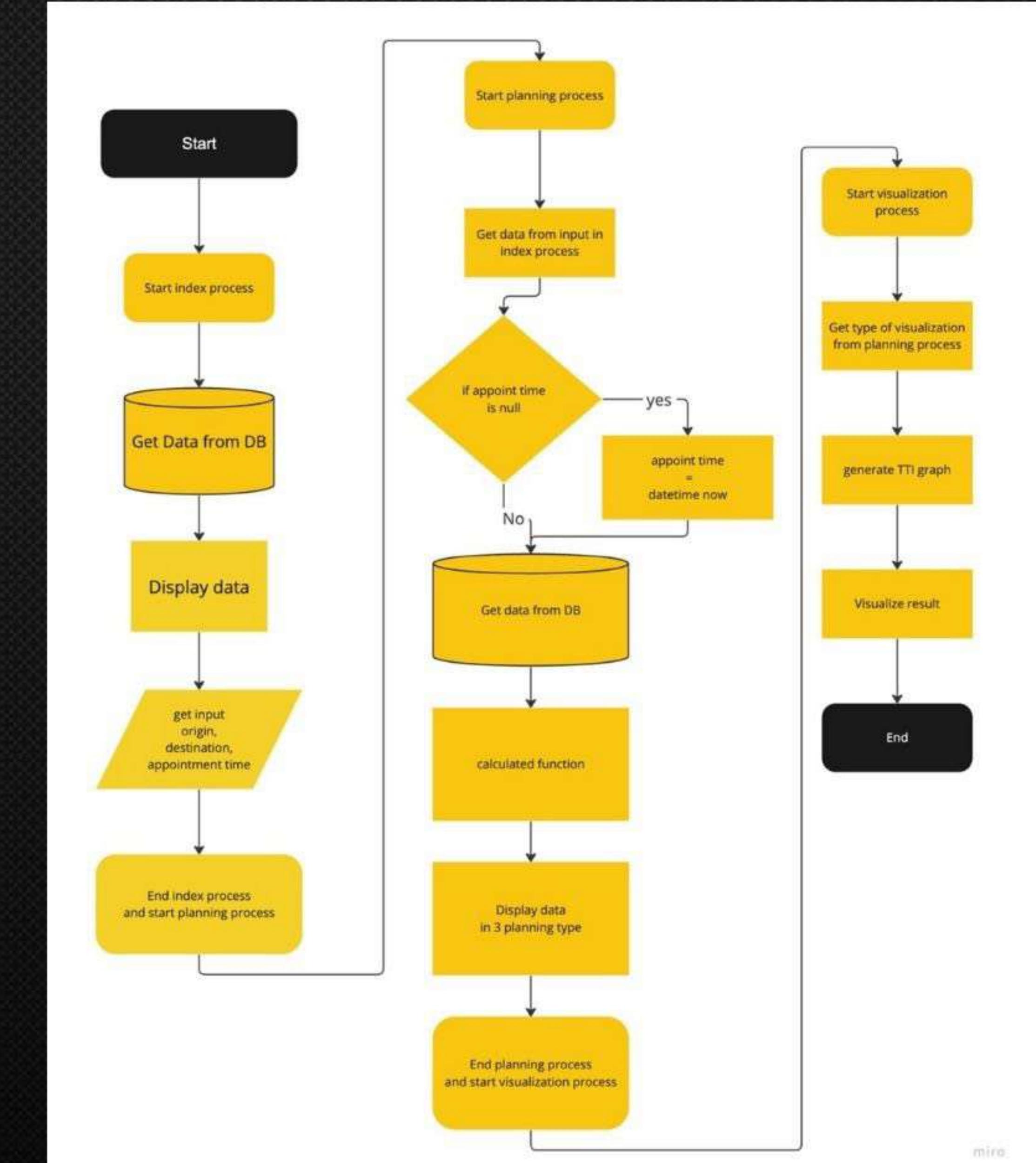
Prototype A

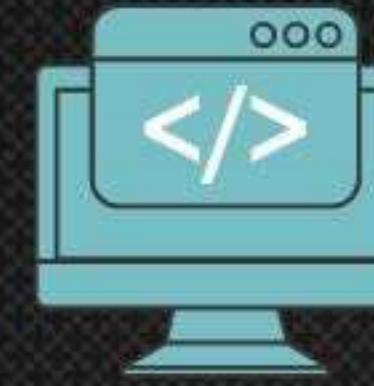
Prototype B

Web application development



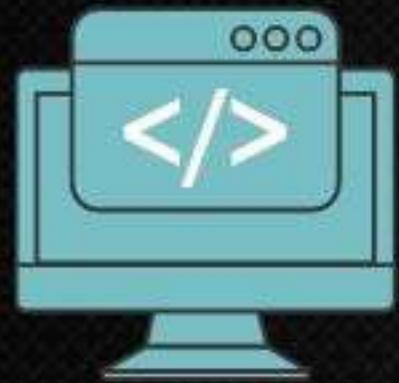
Application flowchart



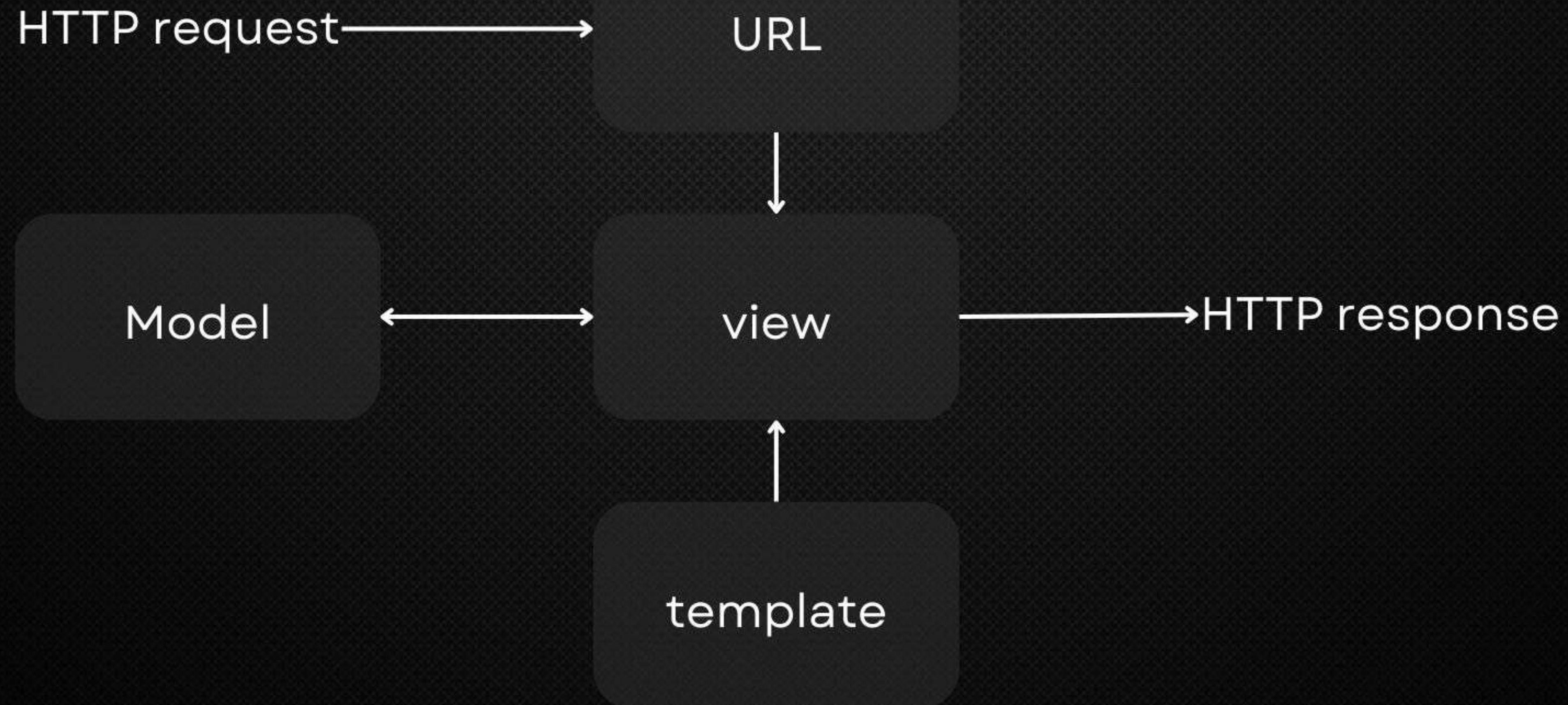


Application develop tools





Django workflow



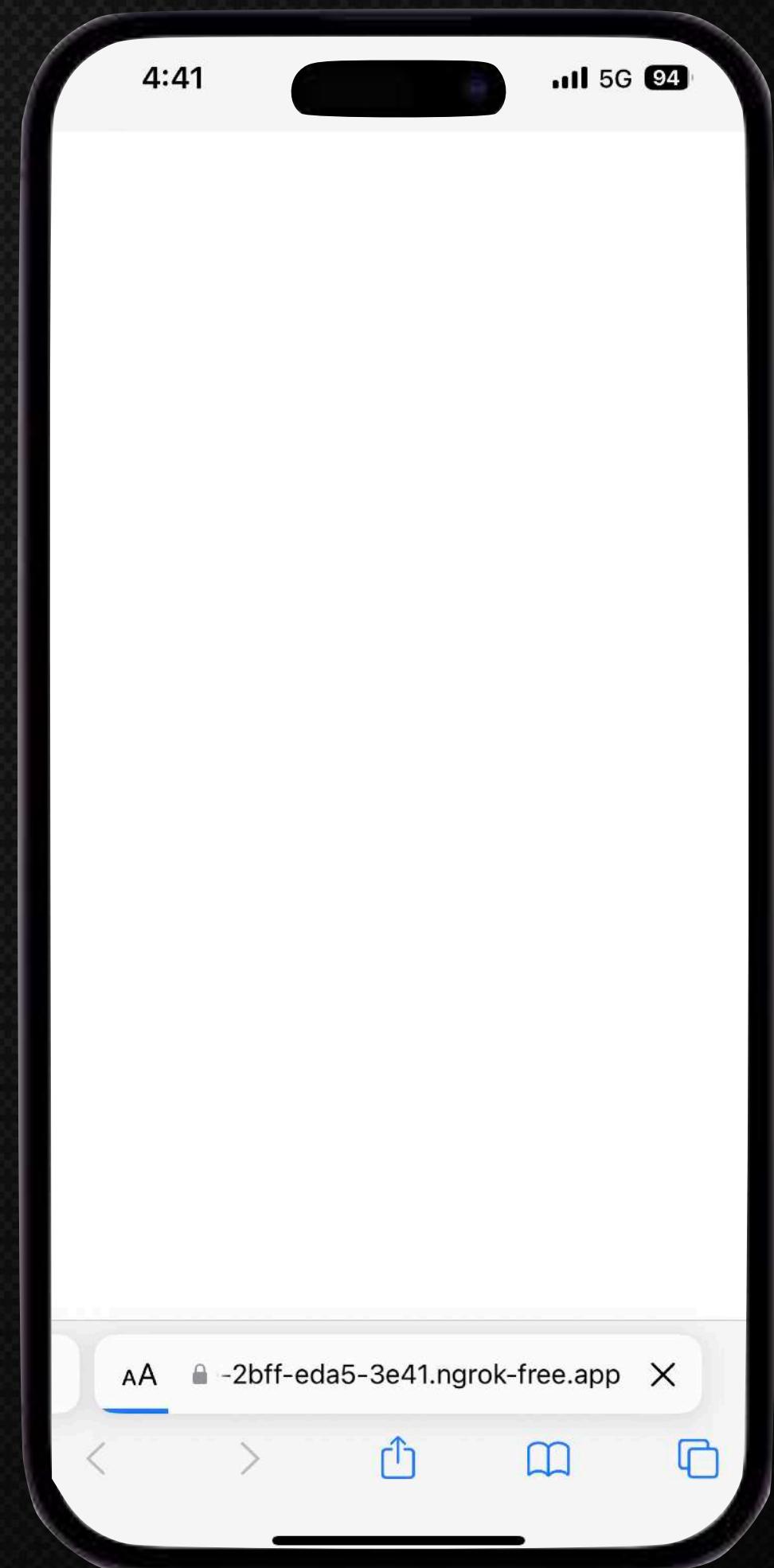
Django framework workflow

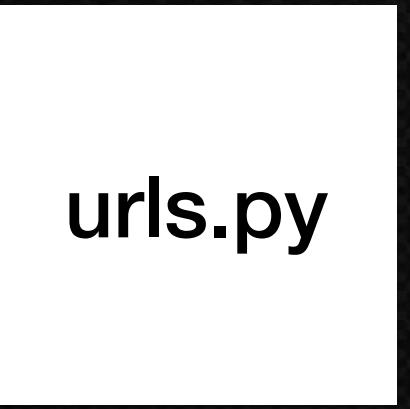




HTTP Request: URL

HTTP Request: URL





HTTP Request: URL



urls.py



urls.py



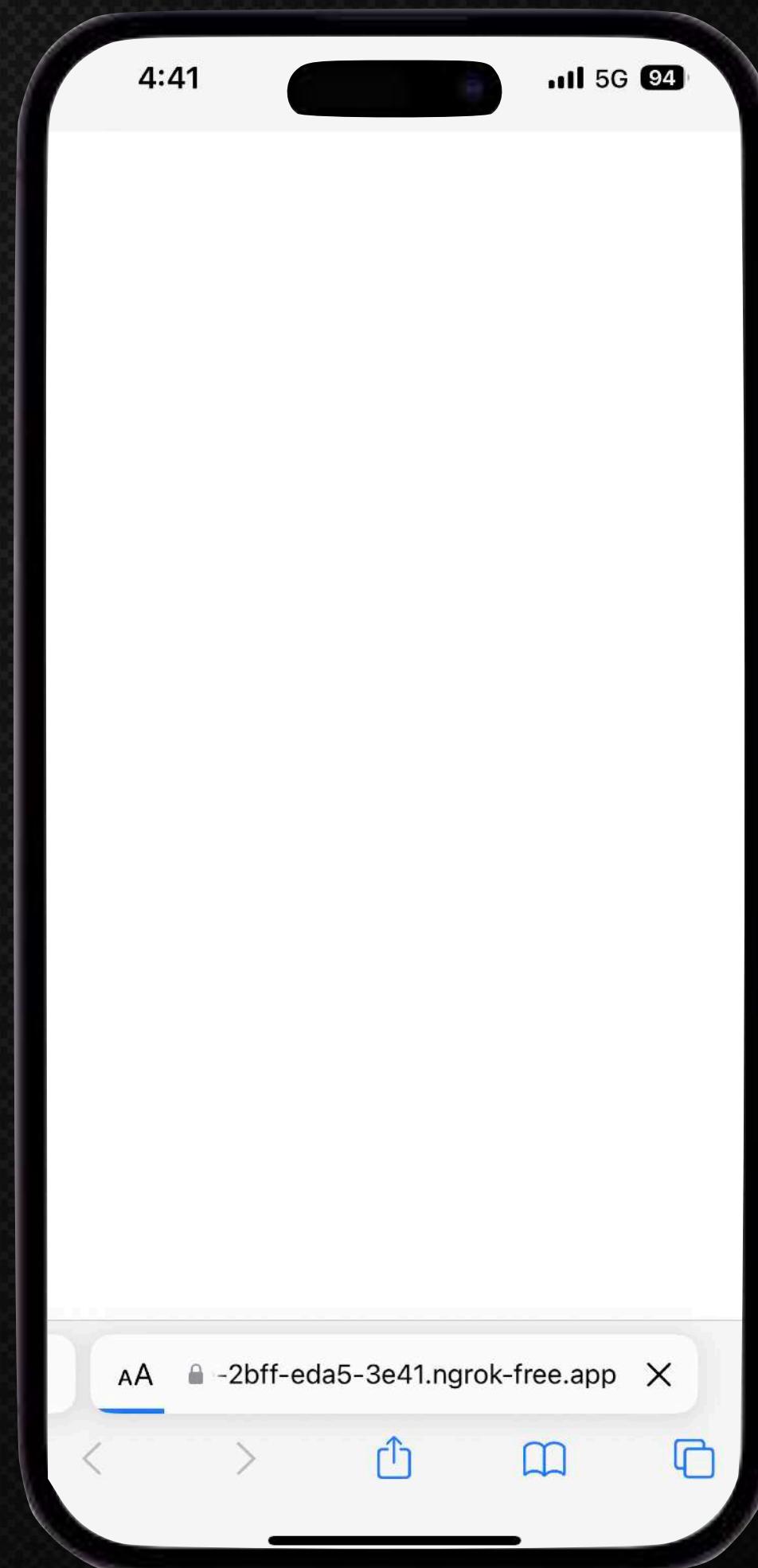
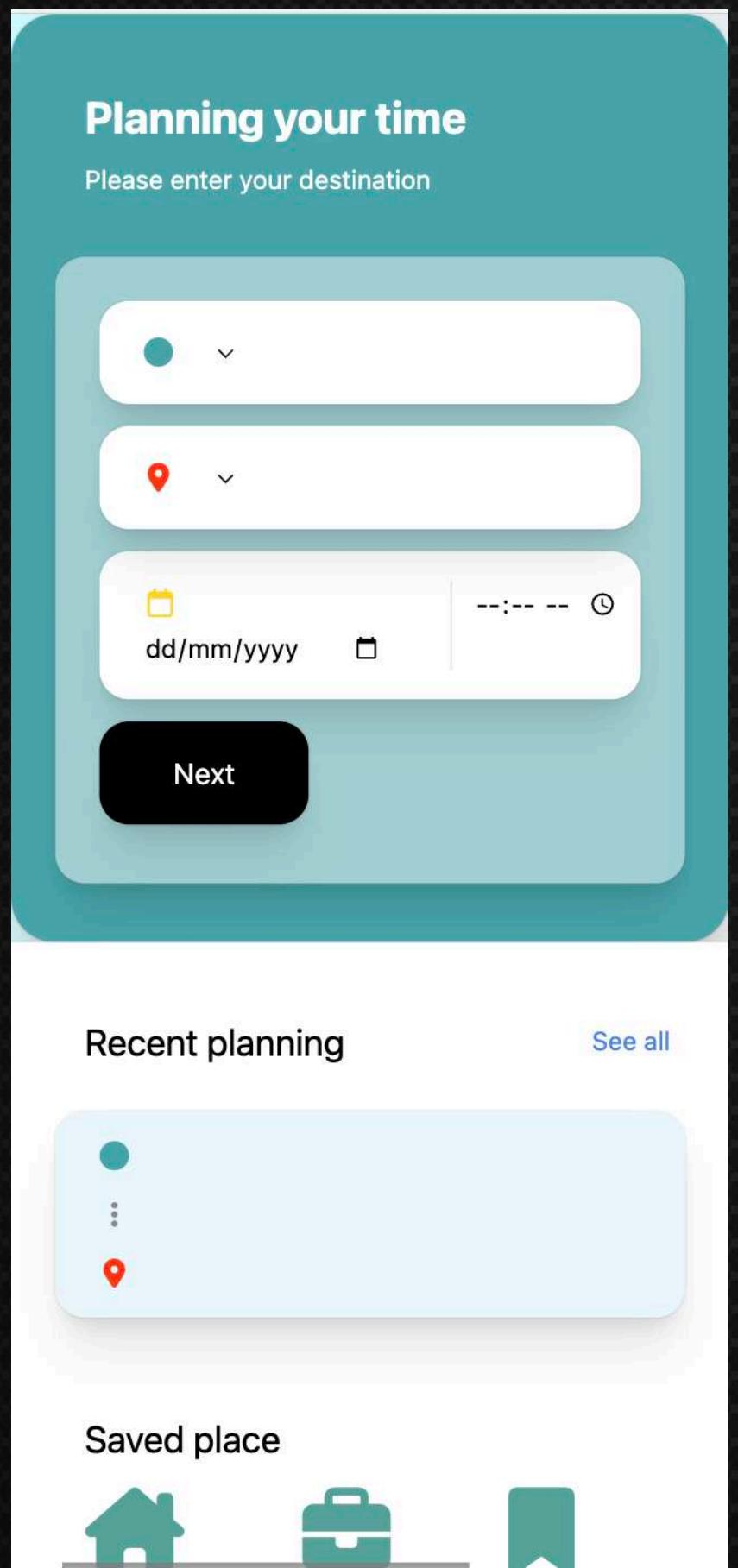
views.py



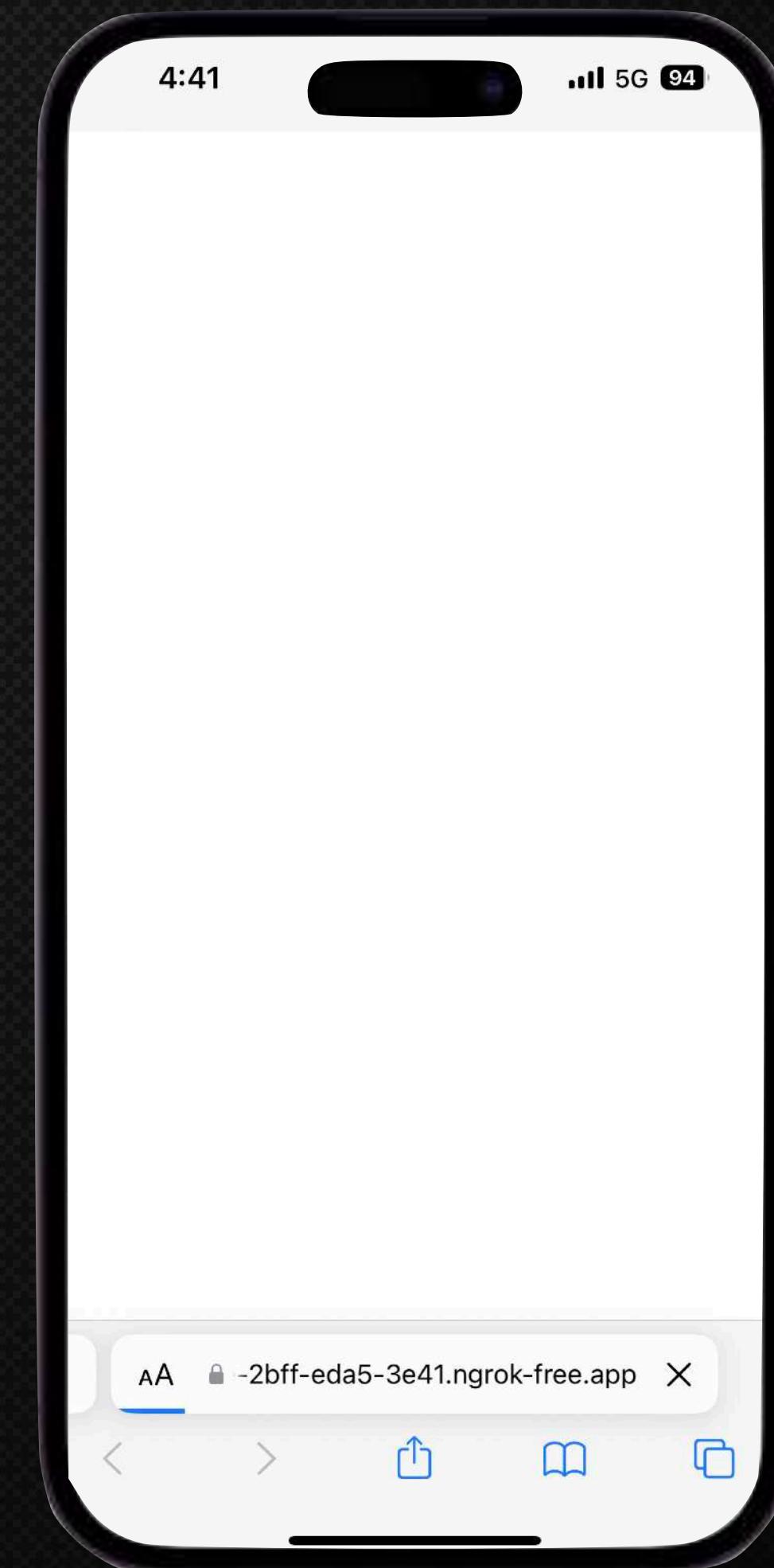
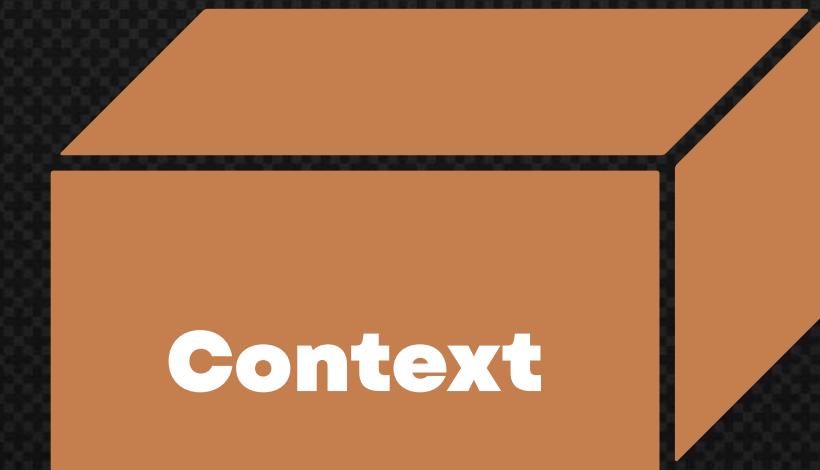
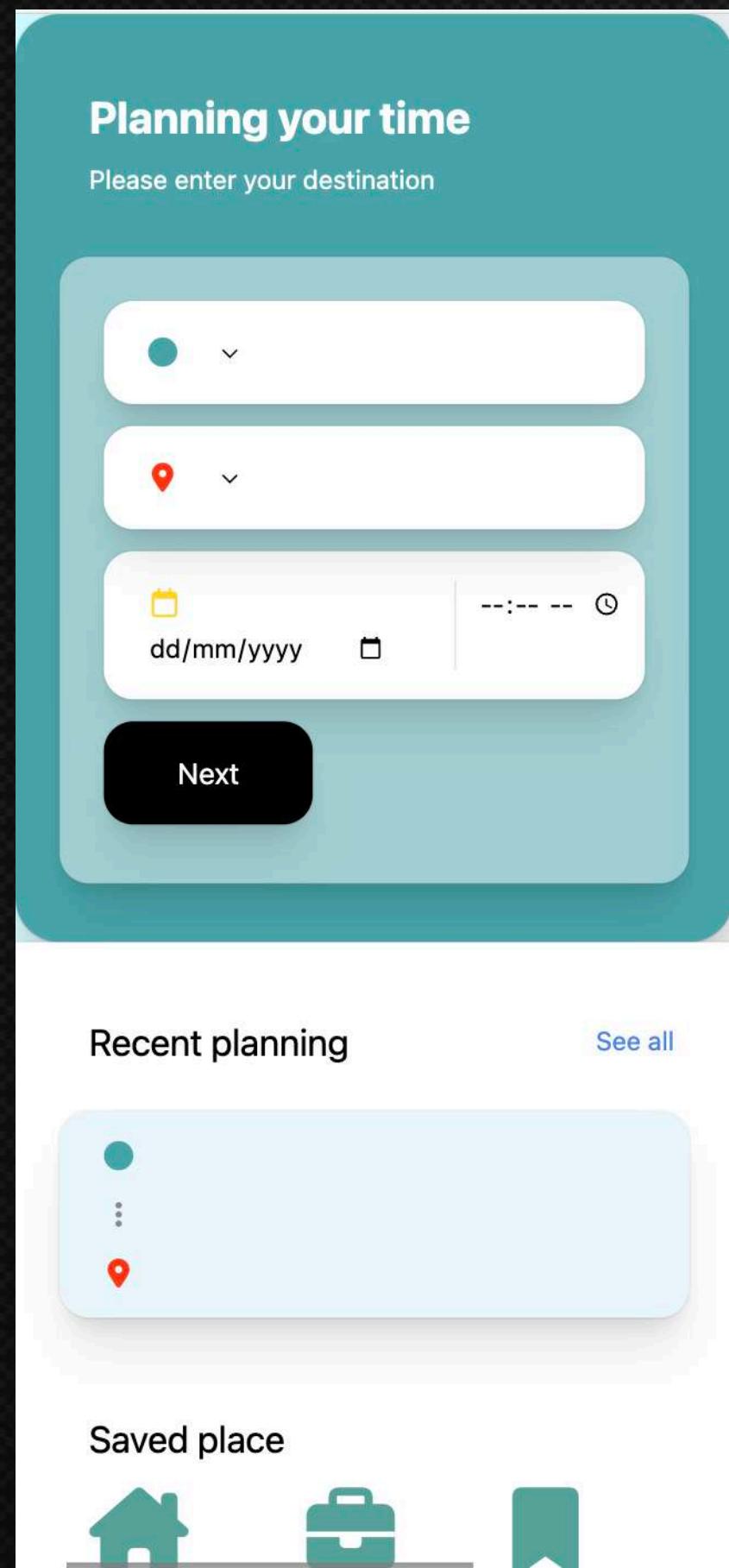
views.py



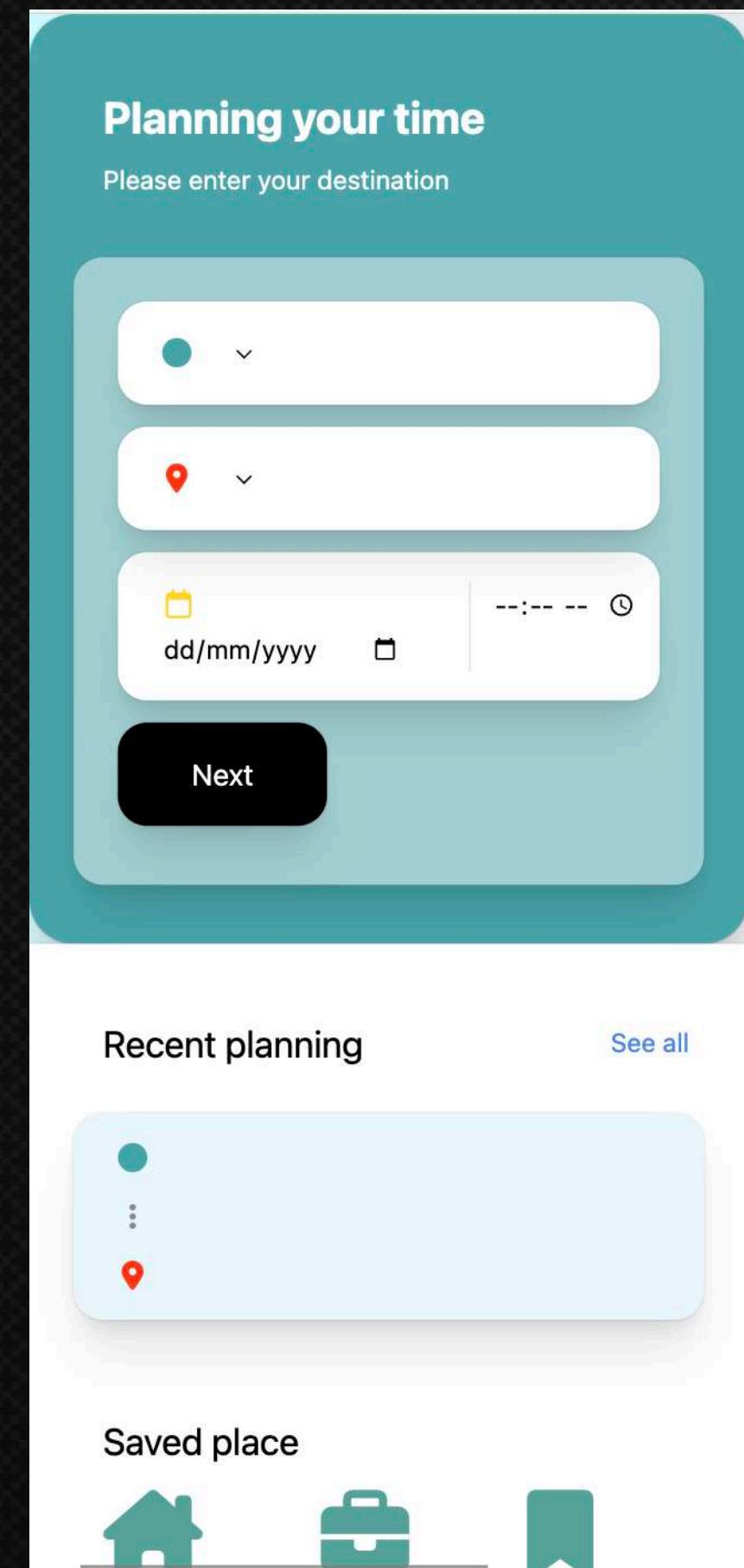
views.py



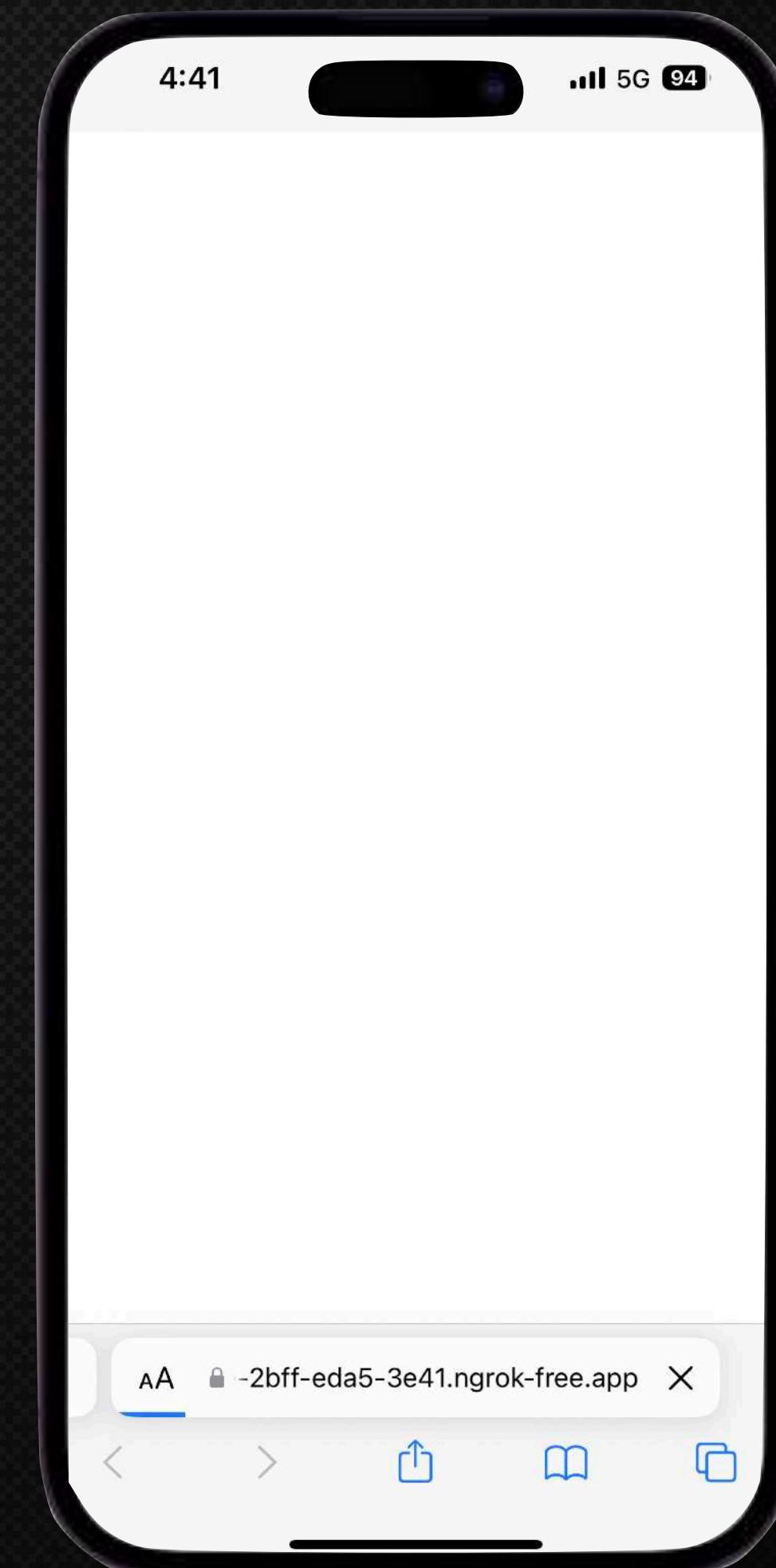
views.py



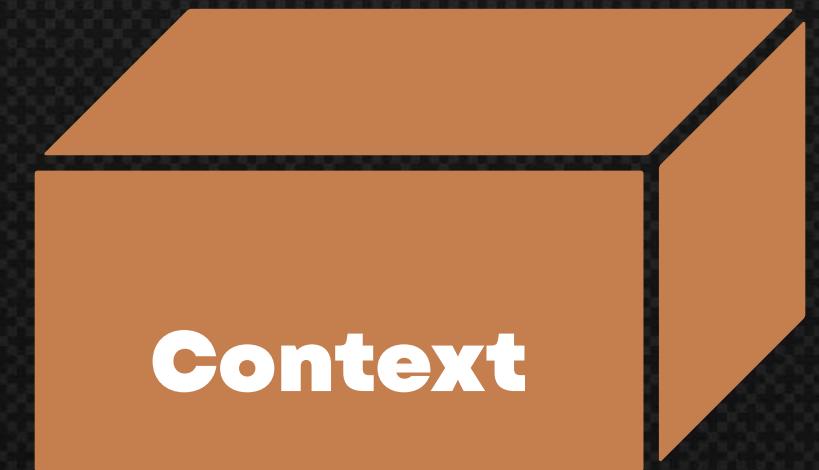
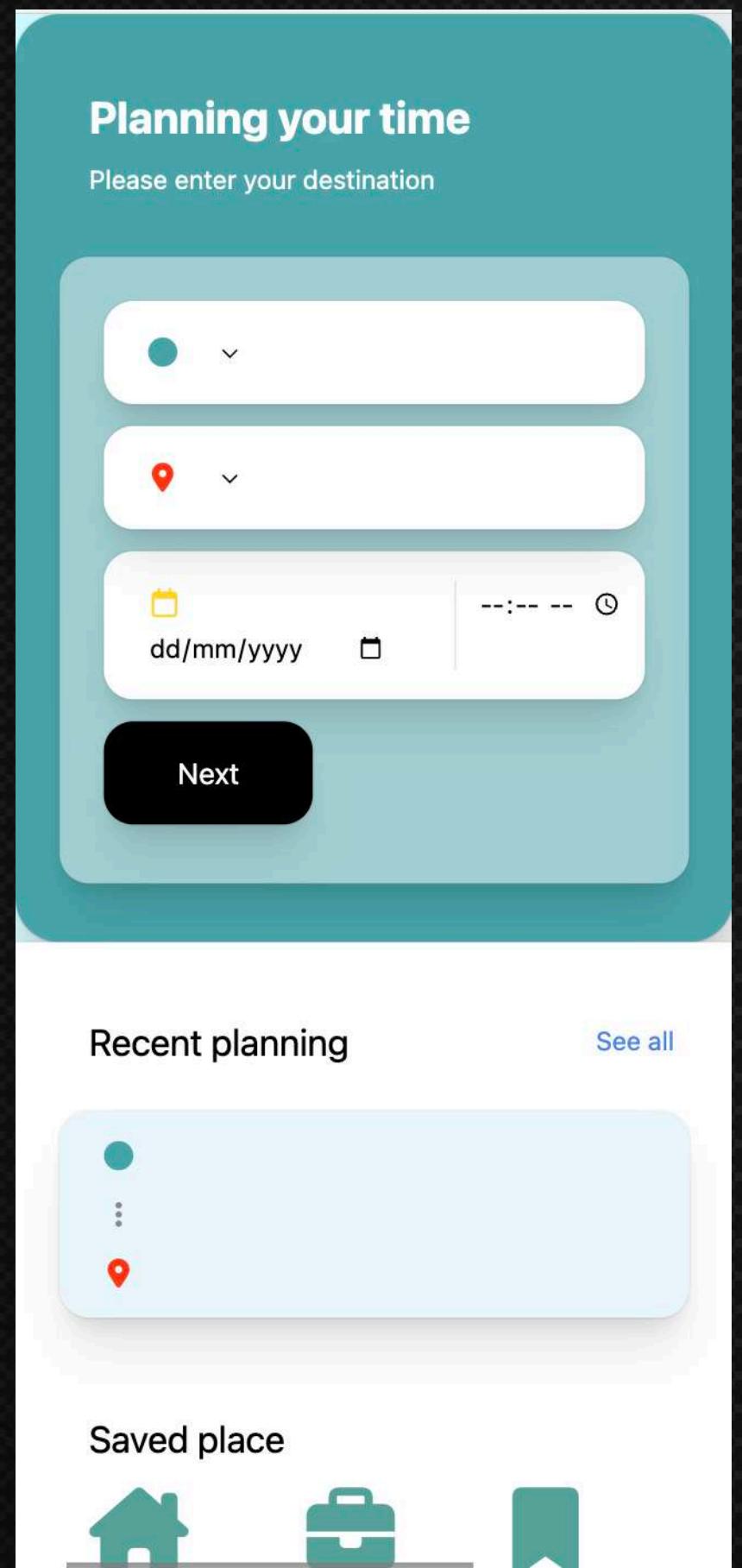
**Data
Process result**



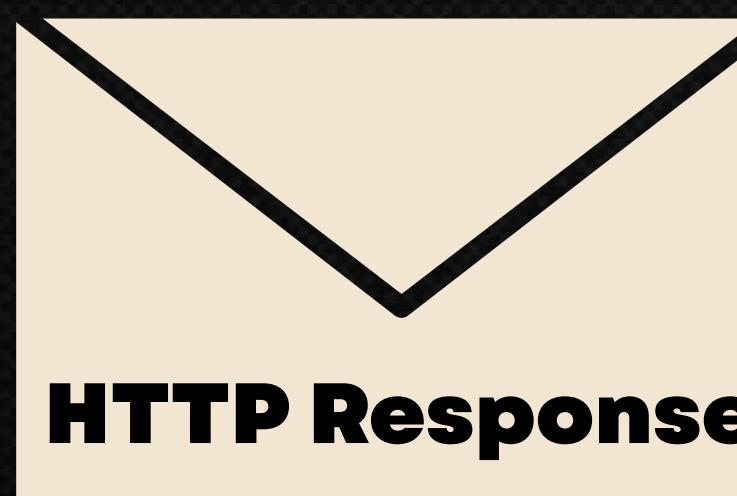
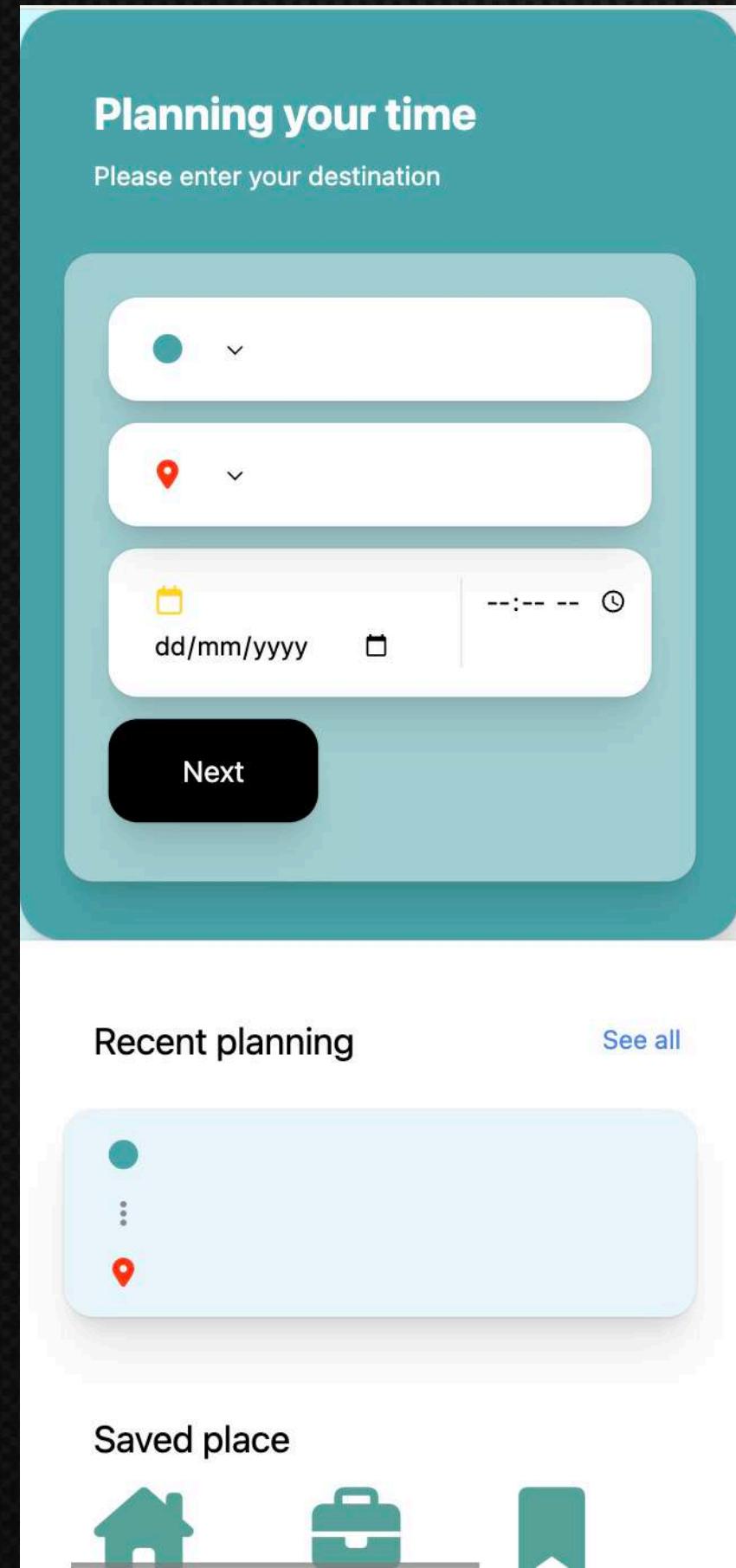
Context



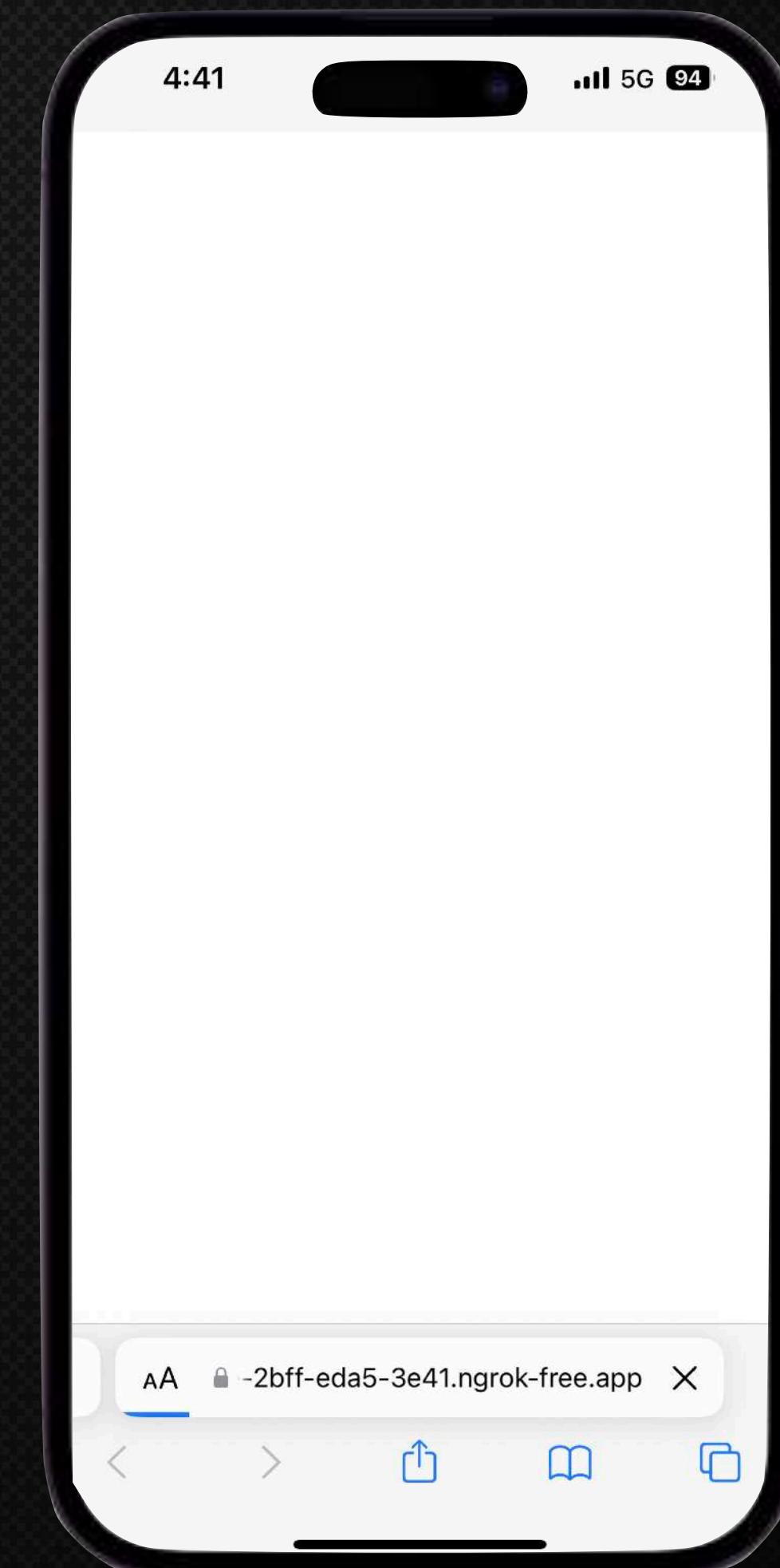
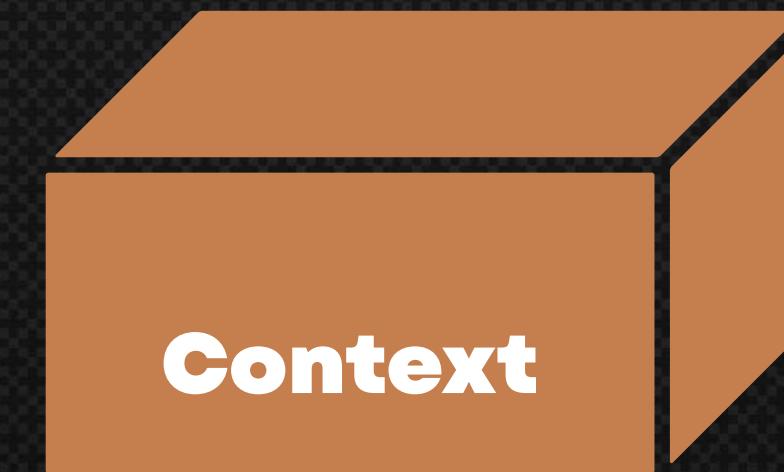
views.py



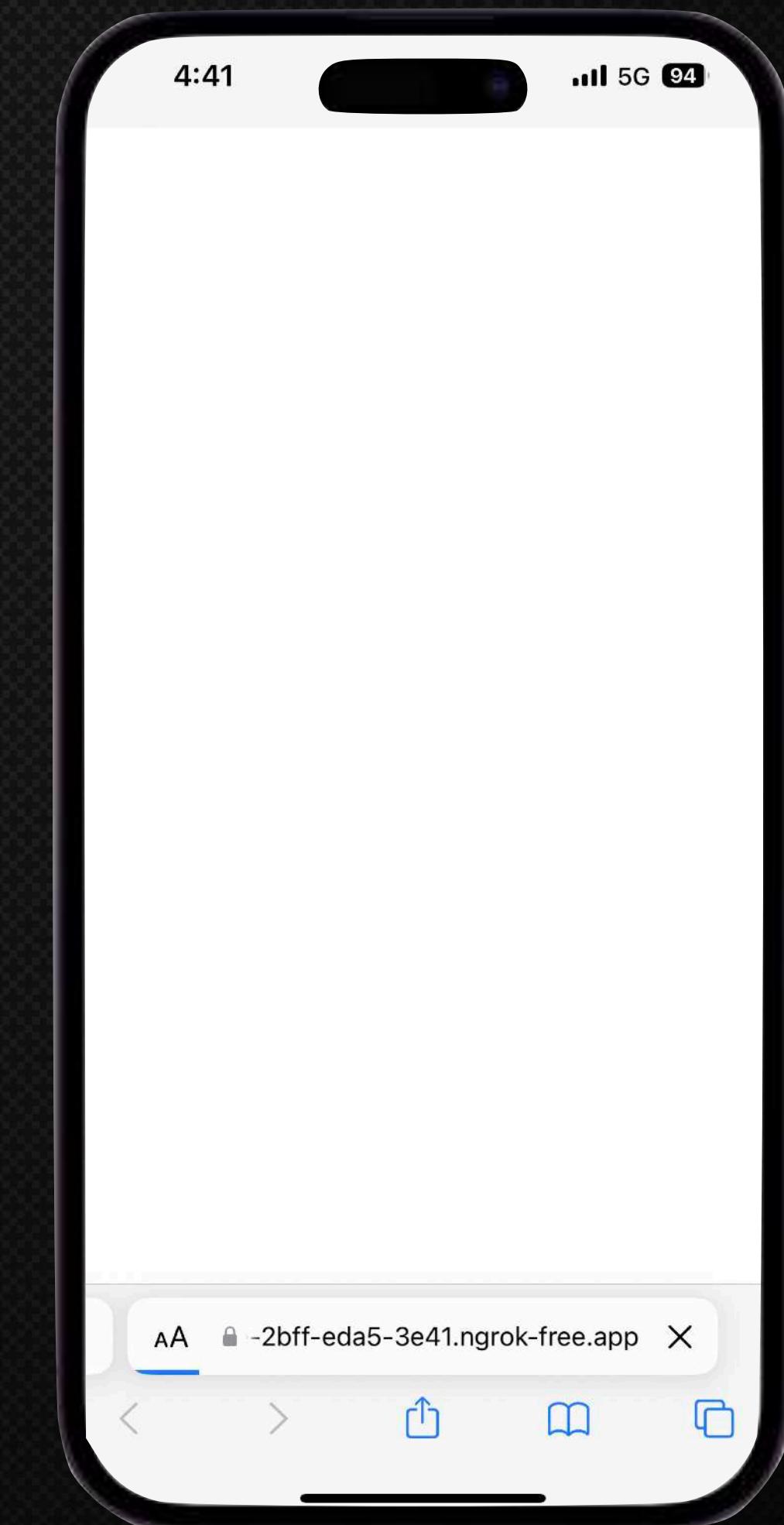
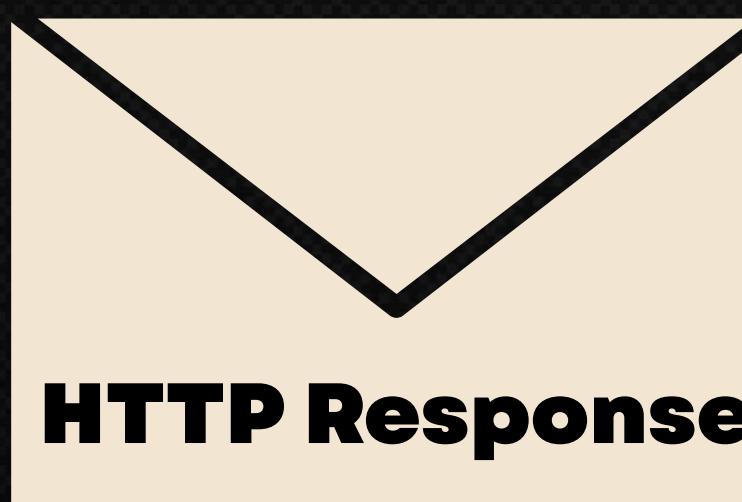
views.py

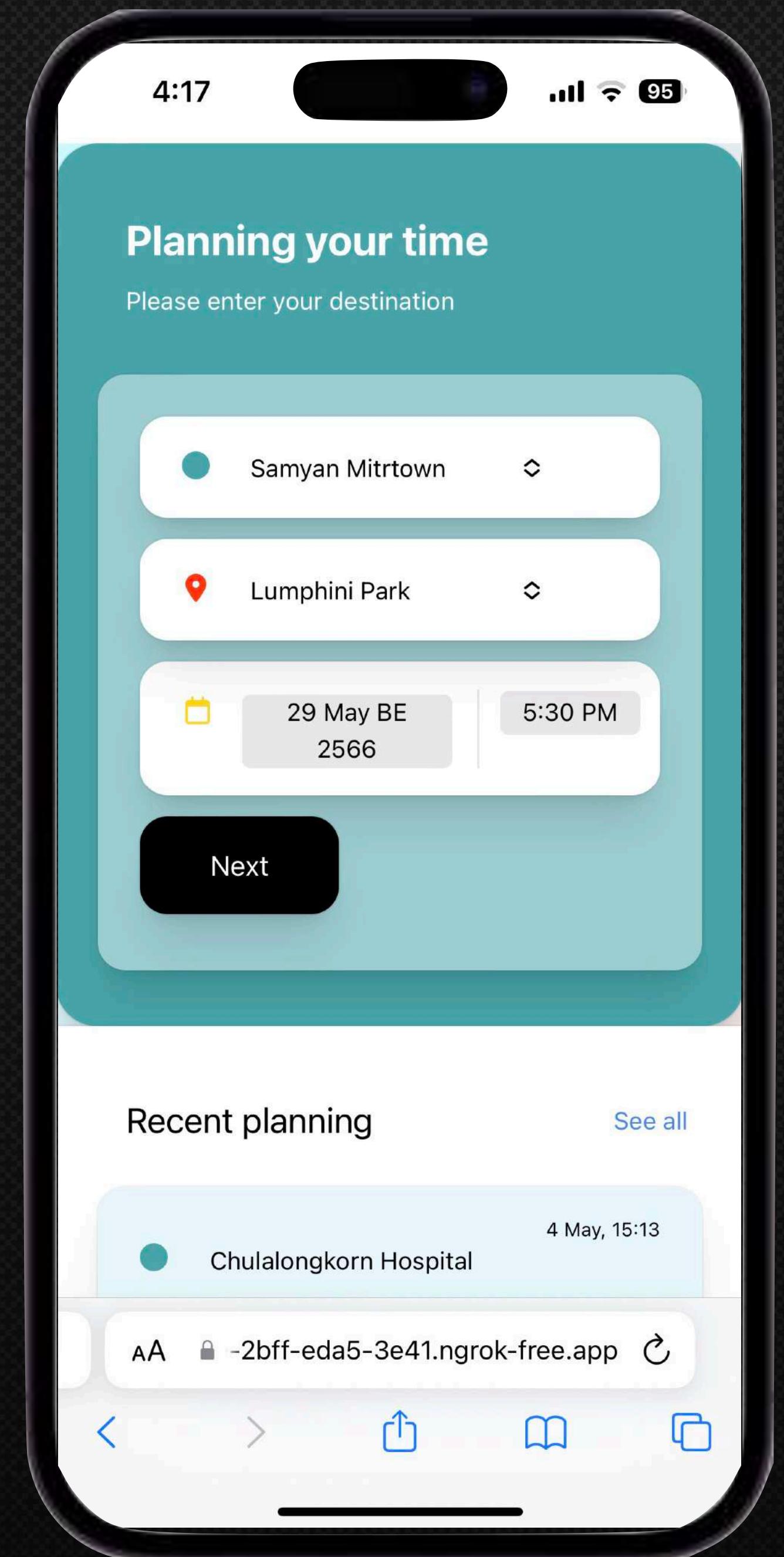


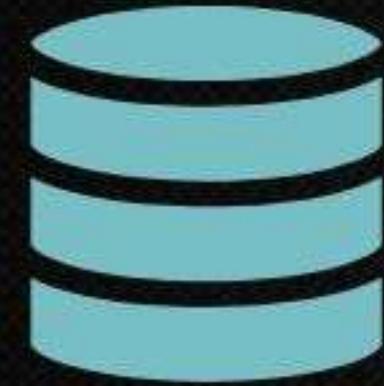
HTTP Response



views.py







Database



location

use in index page
for selecting location

Planning_temp

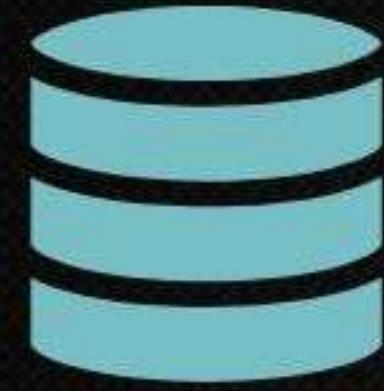
temporary table
for collect planning data

Varandma

processed data result

Recentplan

collecting every
planning history



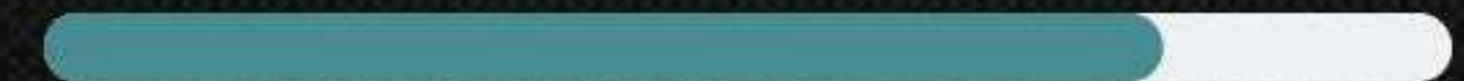
GitHub check some code



<https://github.com/panutrytobeprogrammer/sv-project>

4

Results and discussions



loading 80% ...



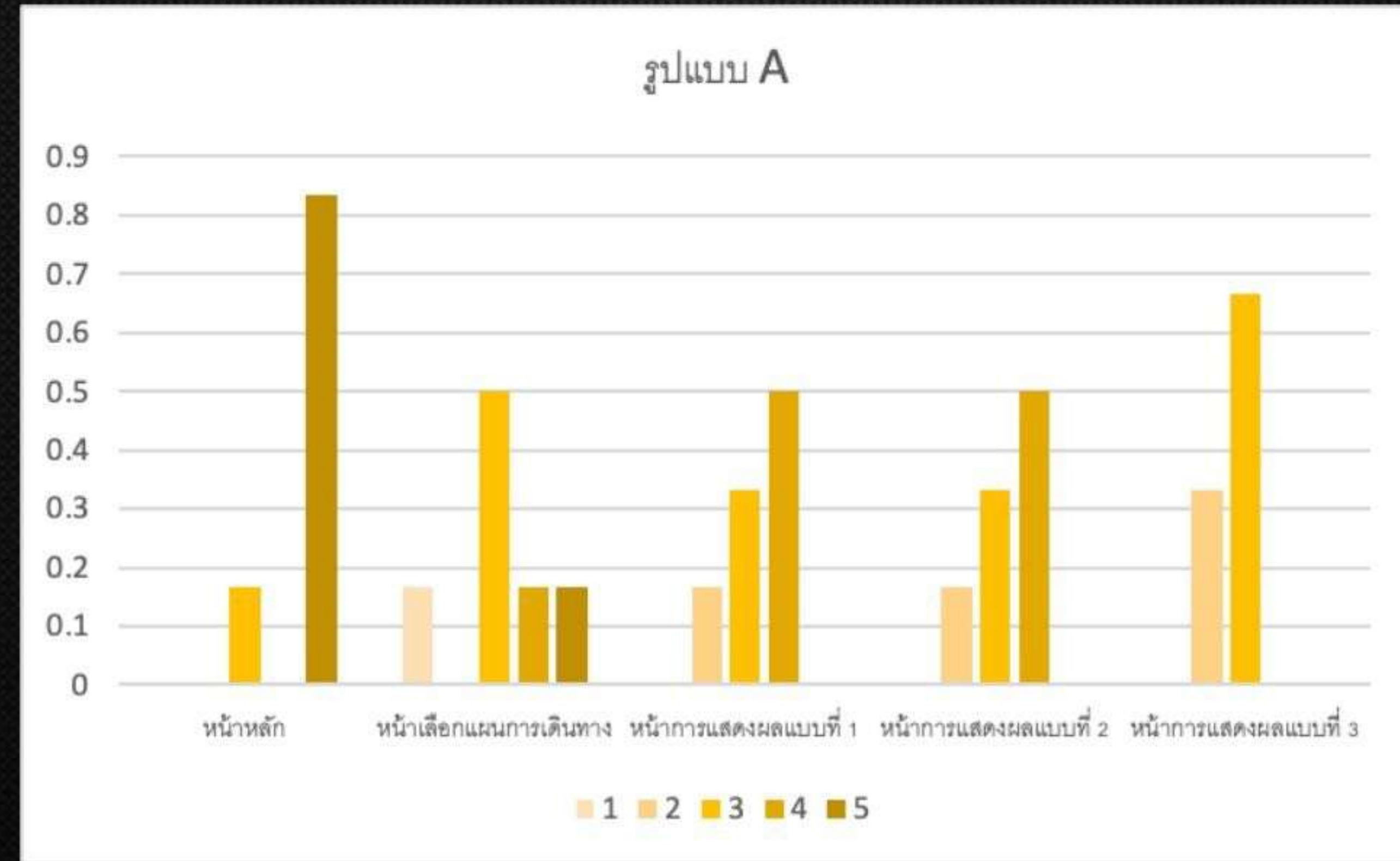
A/B Testing

Prototype A

รูปแบบ A	รูปแบบ					
	1 น้อยที่สุด	2 น้อย	3 ปานกลาง	4 มาก	5 มากที่สุด	เฉลี่ย
หน้าหลัก	-	-	16.70%	-	83.33%	4.67
หน้าเลือกแผนการเดินทาง	16.70%	-	50.00%	16.70%	16.70%	3.17
หน้าการแสดงผลแบบที่ 1	-	16.70%	33.30%	50.00%	-	3.33
หน้าการแสดงผลแบบที่ 2	-	16.70%	33.30%	50.00%	-	3.33
หน้าการแสดงผลแบบที่ 3	-	33.30%	66.70%	-	-	2.67



Prototype A ————— Result

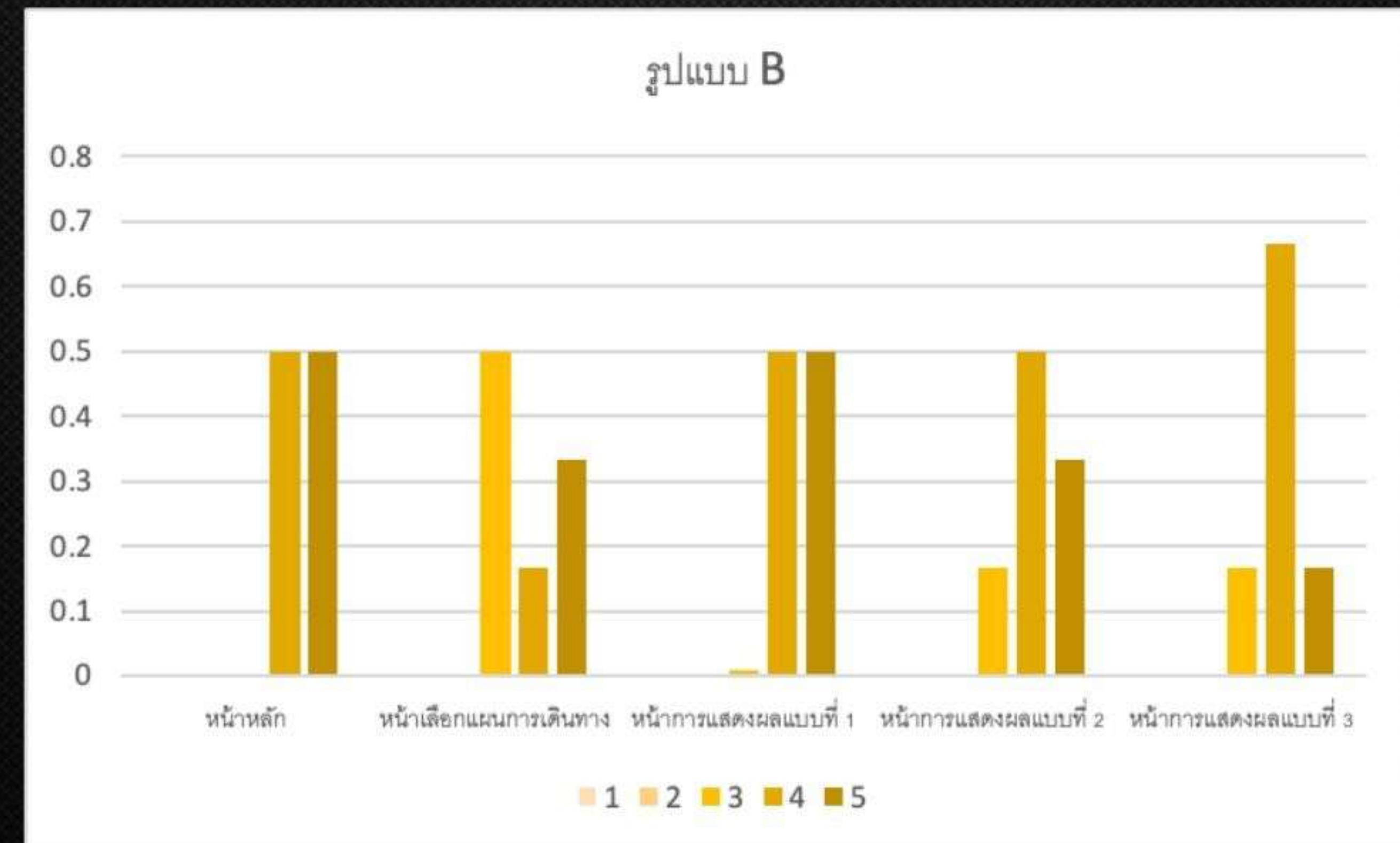


Prototype B

รูปแบบ B	คะแนน					
	1 น้อยที่สุด	2 น้อย	3 ปานกลาง	4 มาก	5 มากที่สุด	เฉลี่ย
หน้าหลัก	-	-	-	50.00%	50.00%	4.50
หน้าเลือกแผนการเดินทาง	-	-	50.00%	16.70%	33.30%	3.83
หน้าการแสดงผลแบบที่ 1	-	-	-	50.00%	50.00%	4.53
หน้าการแสดงผลแบบที่ 2	-	-	16.70%	50.00%	33.30%	4.17
หน้าการแสดงผลแบบที่ 3	-	-	16.70%	66.67%	16.70%	4.00

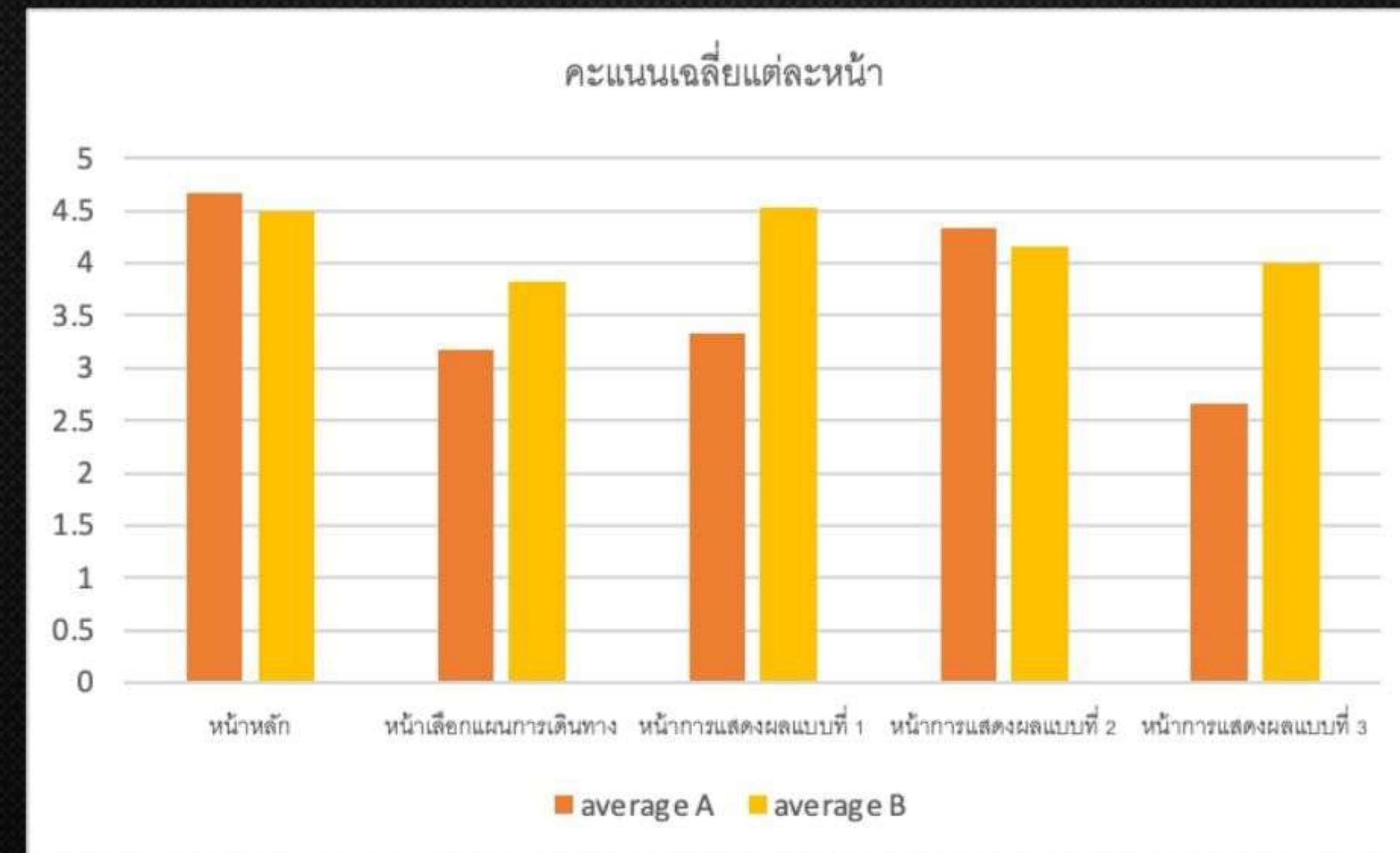


Prototype B ————— Result





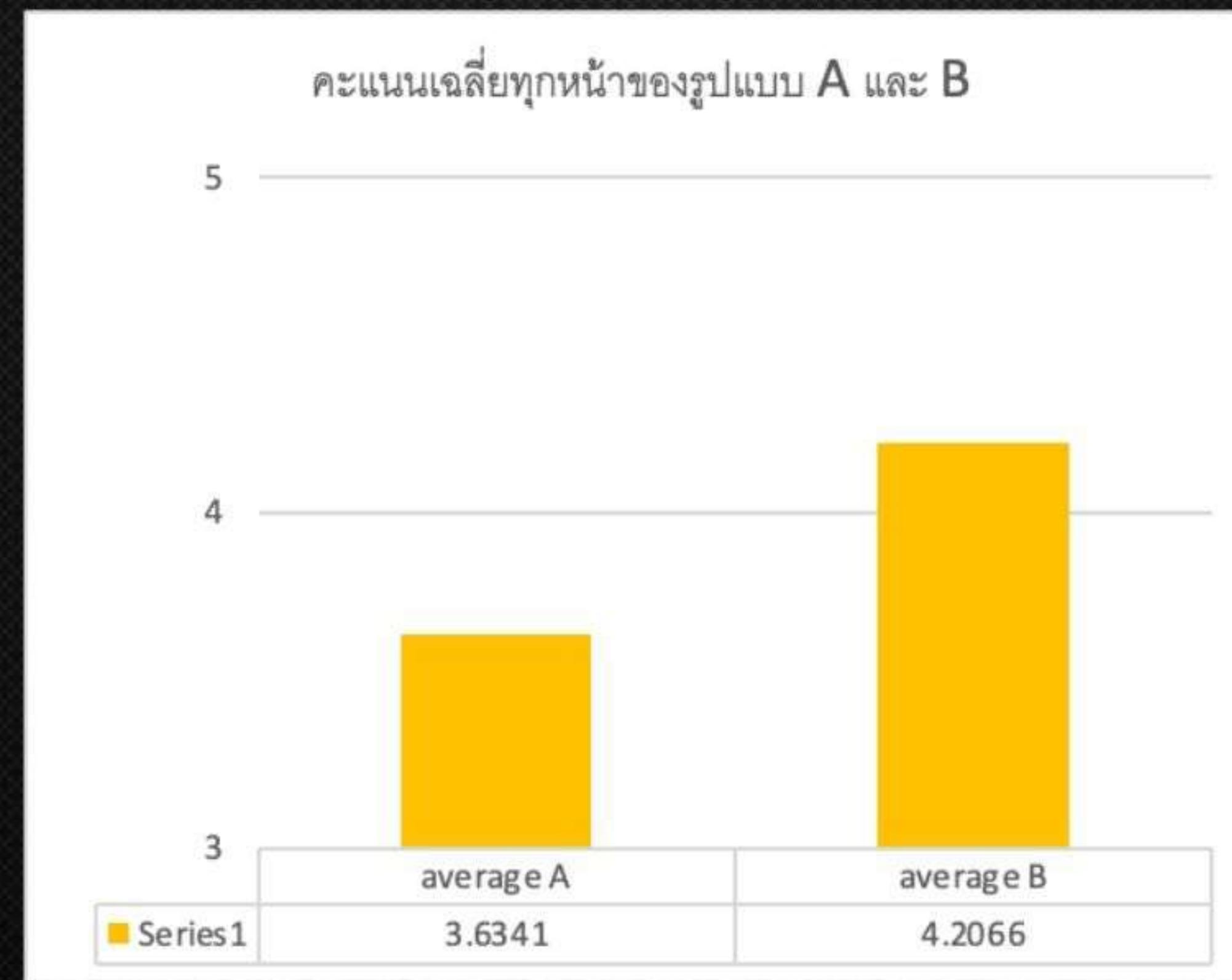
The average scores



A graph comparing the average scores of each page



The average scores

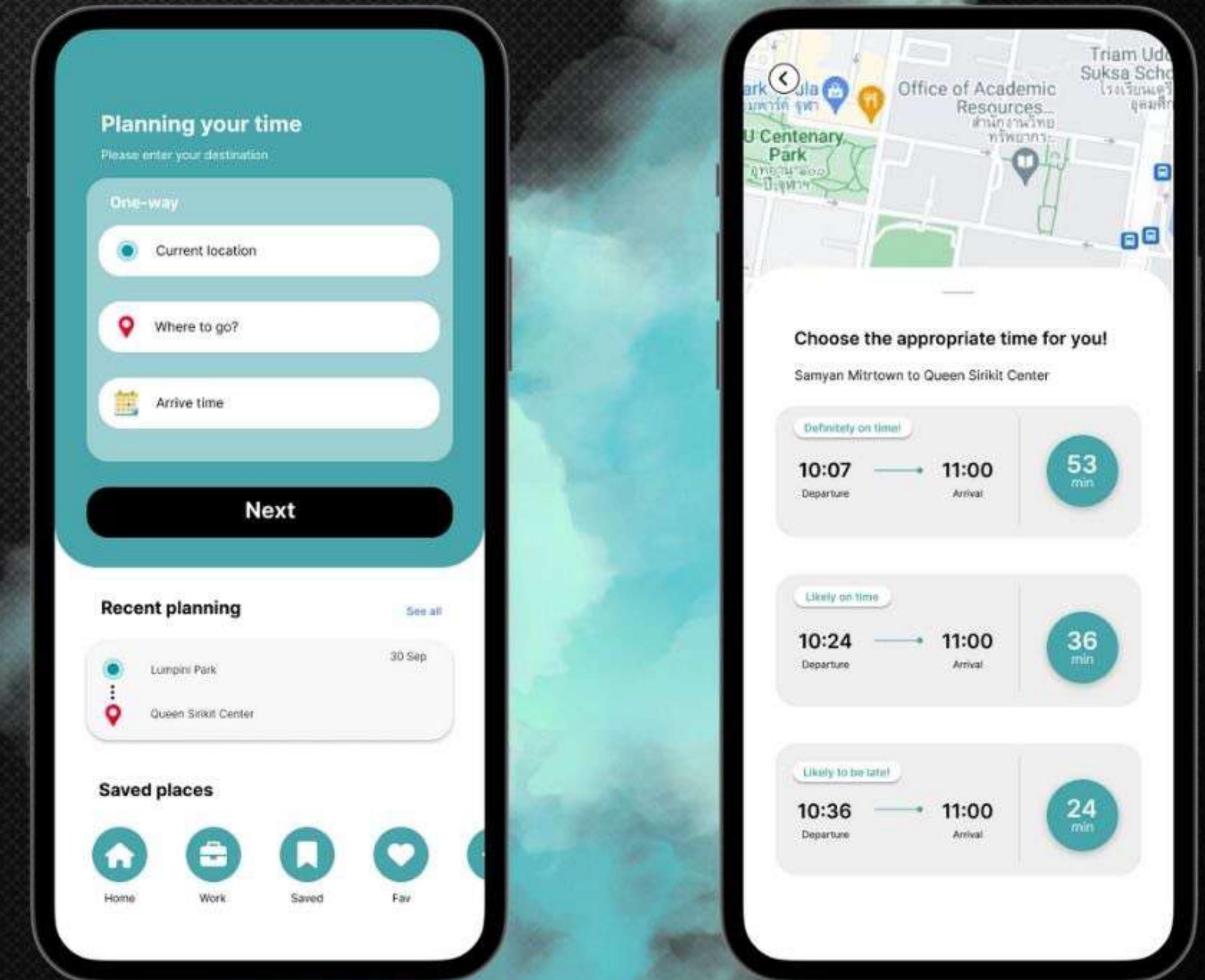


The average score for each page in prototype A is 3.3641, and for prototype B it is 4.2066, out of a total score of 5.

Result

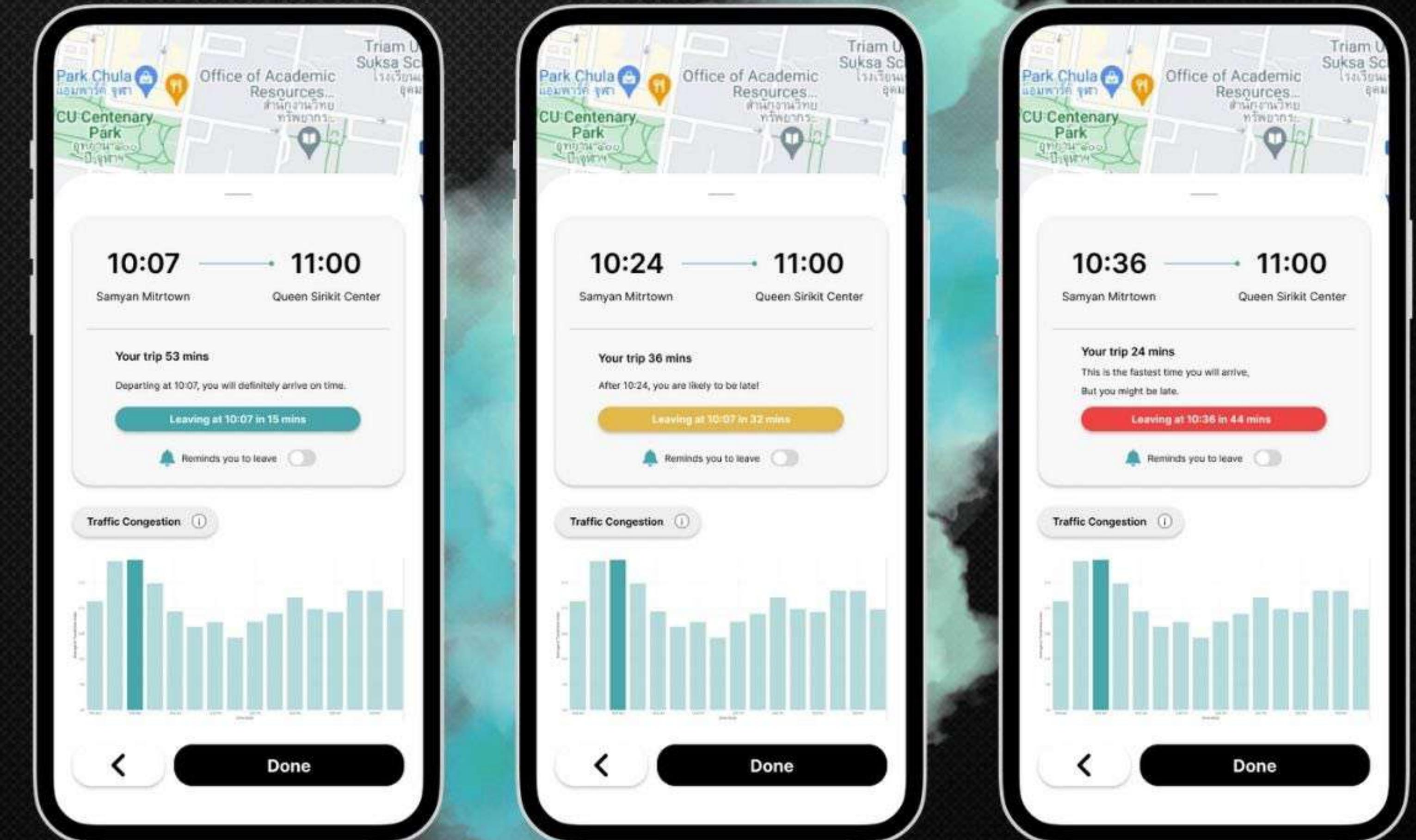
Step 1

Home page



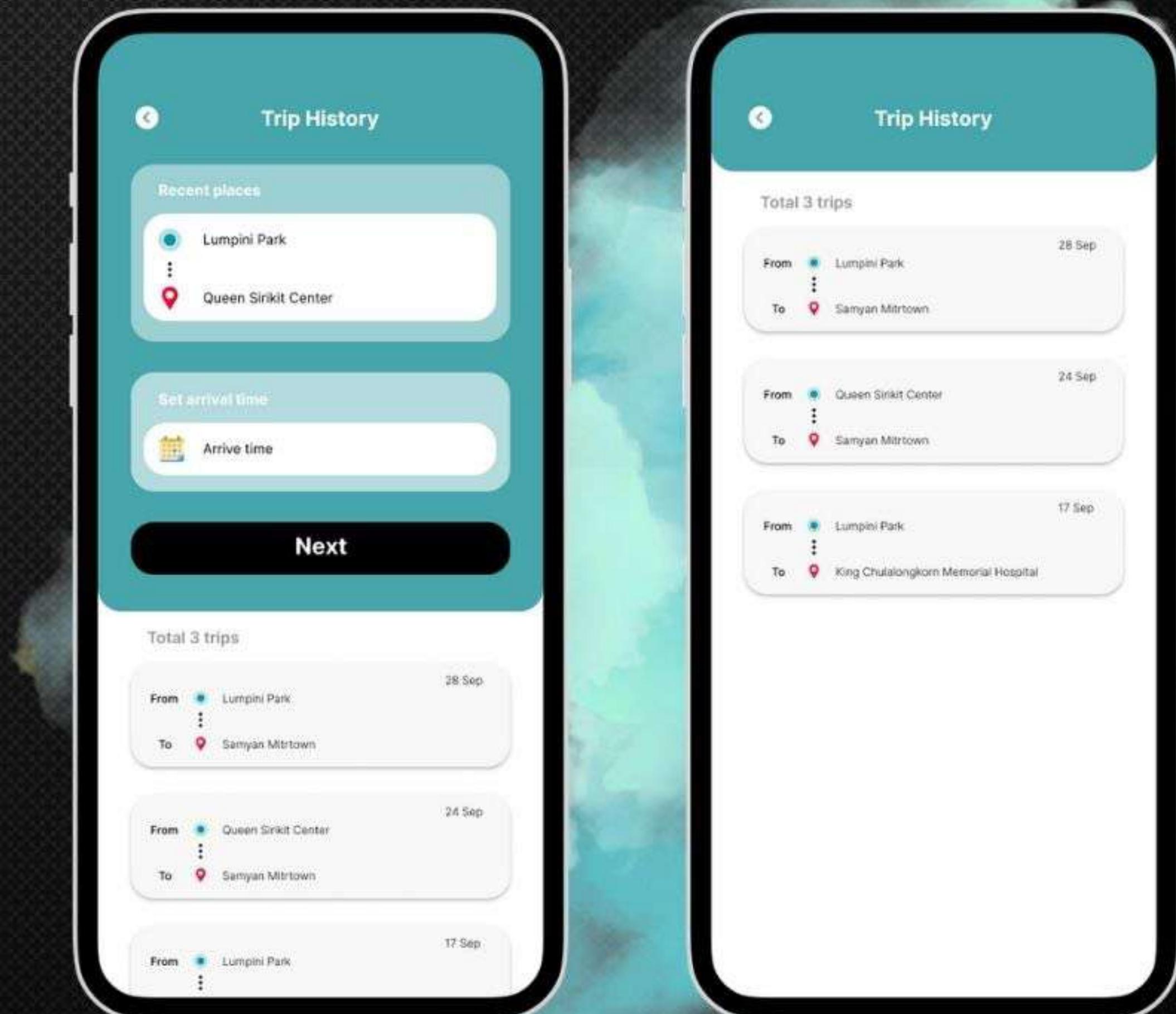
Step 2

Results



Step 3

History search



The logo for Google Analytics features the company name "Google Analytics" in a white, sans-serif font. The word "Google" is on the first line and "Analytics" is on the second line. The entire text is contained within a light blue, irregularly shaped blob that resembles a cloud or a drop of liquid.

Google Analytics



Analysis results

ชื่อ กิจกรรม	จำนวนเหตุการณ์	จำนวนผู้ใช้รวม	จำนวนเหตุการณ์ต่อผู้ใช้
page_view	82	7	11.71428571
scroll	67	6	11.16666667
user_engagement	42	6	7
form_start	21	6	3.5
form_submit	21	6	3.5
session_start	12	7	1.714285714
first_visit	9	7	1.285714286
รวมทั้งหมด	254	7	36.29



Analysis results

ชื่อหน้าเว็บและคลาสหน้าจอ	จำนวนการดู	ผู้ใช้	จำนวนการดูต่อผู้ใช้	เวลาในการมีส่วนร่วมโดยเฉลี่ย	จำนวนเหตุการณ์กั้งหมัด
senior project Home	30	7	4.285	0 นาที 35 วินาที	87
senior project Visualization	20	5	4	0 นาที 12 วินาที	47
senior project Login	15	6	2.5	0 นาที 21 วินาที	58
senior project Planning	12	5	2.4	0 นาที 13 วินาที	45
senior project Register	3	2	1.5	0 นาที 13 วินาที	10
senior project Coming Soon	1	1	1	0 นาที 02 วินาที	3
senior project Trip history	1	1	1	0 นาที 03 วินาที	4
รวมกั้งหมัด	82	7	11.71	1 นาที 17 วินาที	254

5

Conclusions and recommendation

loading 100% ...

Conclusions

1

Summary

2

What's next in UX/UI?

3

What's next in application development?

4

Recommendation

You can try this at home

Try this app to plan your time to the place where you go!

Prof.

Dr. Garavig

user: garavig

pass: giveusAplease

Dr. Pawan

user: pawan

pass: giveusAplease

Dr. Chaichoke

user: chaichoke

pass: giveusAplease



Our friends

user: test[1-7]

pass: seniorproject123

Thank You