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Ulgen – Progress Meeting 5 & Final Demo



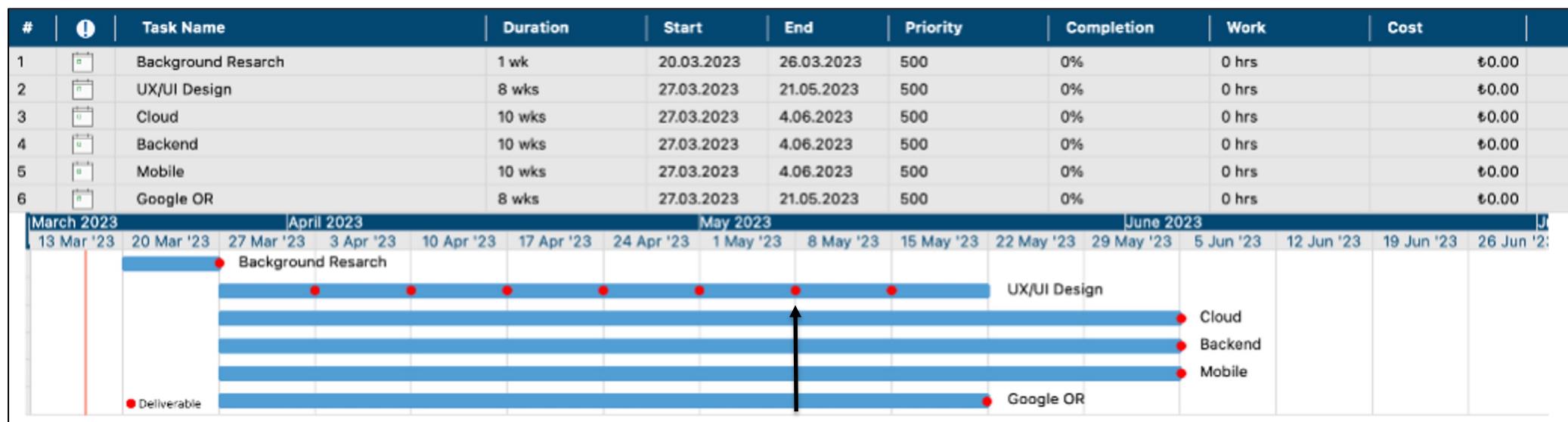
"Ülgen": Residence Activity Monitor and OR Solutions to
Disasters

Kaan Turkmen, Can Usluel
Halil Doruk Yildirim, Bumin Aybars Inci



Previous Progress Meeting

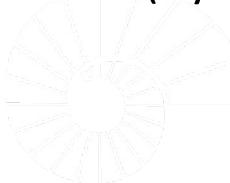
- Email Verification / Forgot Password Endpoints are completed. (Kaan)
- Local Device Scanning is completed / Routing display is partially completed. (Can)
- Most screens updated, visuals revised, and most of our application's screens are complete. Interview questions are revised and begun the interview process. (Doruk)
- Implementation of UI screens are completed (Login, Register, Reset Password, Start and Home Screen) (Aybars)





Current Progress Meeting

- Realtime Activity and Caching is implemented. (Kaan)
- MAC Scanner is connected, and periodically produces data. (Can)
- Created Poster Draft. (Doruk)
- Data Screen for Routing and Heatmap is implemented. (Aybars)



#	!	Task Name	Duration	Start	End	Priority	Completion	Work	Cost
1		Background Research	1 wk	20.03.2023	26.03.2023	500	0%	0 hrs	€0.00
2		UX/UI Design	8 wks	27.03.2023	21.05.2023	500	0%	0 hrs	€0.00
3		Cloud	10 wks	27.03.2023	4.06.2023	500	0%	0 hrs	€0.00
4		Backend	10 wks	27.03.2023	4.06.2023	500	0%	0 hrs	€0.00
5		Mobile	10 wks	27.03.2023	4.06.2023	500	0%	0 hrs	€0.00
6		Google OR	8 wks	27.03.2023	21.05.2023	500	0%	0 hrs	€0.00

March 2023 April 2023 May 2023 June 2023

13 Mar '23 20 Mar '23 27 Mar '23 3 Apr '23 10 Apr '23 17 Apr '23 24 Apr '23 1 May '23 8 May '23 15 May '23 22 May '23 29 May '23 5 Jun '23 12 Jun '23 19 Jun '23 26 Jun '23

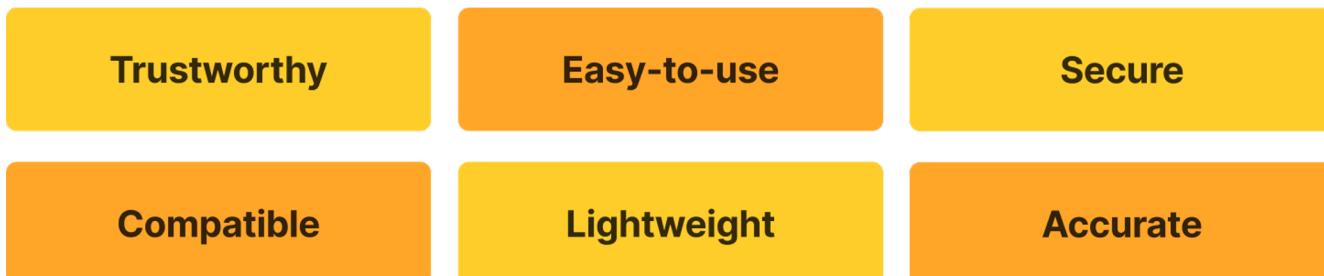
Background Research UX/UI Design Cloud Backend Mobile Google OR

Deliverable



Introduction

- Background
- Difference
- Purpose



NEEDS
What exactly is the extent of the problem we are trying to solve?

Communicating with authorities with limited/no resources during crisis
Increasing coordination and effectiveness during rescue operations

Efficiency is key

THE LANDSCAPE

How are the other solutions currently available?

Current Solutions



- View the emergency assembly areas
- Initiate emergency calls in case of a disaster
- Watch related videos/content



- Let loved ones know when you are not in danger during a disaster with the touch of a button
- Whistle sound

- Some users report it working slow, as well as incorrect information regarding emergency assembly areas.
- Most users report that the location system is faulty; sends incorrect data regarding location even in non-crisis scenarios



Introduction

What can we do?

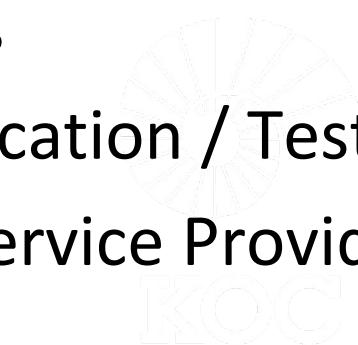
Our application will collect the data of users of their access to their local network and extract information regarding their connectivity activity, which we will then use as an indicator of how many people were within the household at that moment.

Recommendations will be forwarded to authorities during such disasters for them to distribute their forces in the most effective way with the help of our data, algorithms and OR solutions.



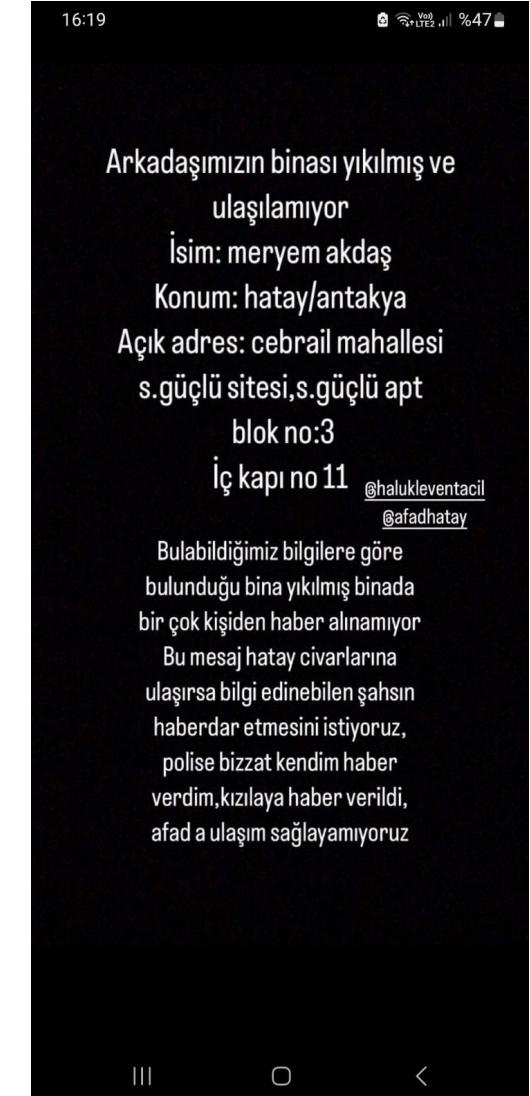
Use Cases

- Download and Forget (Disaster Victim)
- Route and Assist (People Providing Aid)
- Data Eviction by Authorities
- Twitter Developer API Revocation / Testing Limitations
- Data Collection Method / Service Provider API



Yarın yola çıkıyoruz. Destek veren herkese teşekkürler. İlk durağımız Elbistan. Sürekte nerede ihtiyaç olursa ulaşmaya çalışacağız.

* Yanımızda bol miktarda kedi-köpek mamaşı da var. Acil ihtiyacı olanları lütfen yazın





Ulgen Application

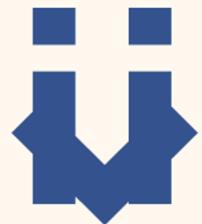


Ülgen'e hoş geldin!

Olası afet durumlarına karşı
sevdiklerinin ve kendinin
durumunu yetkililere bildir, hem
de mobil cihazına dokunmadan.

Hesap oluştur

Zaten hesabın var mı? Giriş yap



Ülgen hesabına giriş yap

e-mail

farukkoc@gmail.com

şifre

şifreni mi unuttun?

Giriş yap

Hesabın yok mu? Hesap oluştur



Hoş geldin!

Ülgen hesabını oluştur

ad-soyad
Faruk Koç

e-mail
farukkoc@gmail.com

şifre

Hesap oluşturarak Ülgen Kullanım Şartlarını
kabul ediyorum ve Gizlilik Beyanını onaylıyorum.

Hesap oluştur

Zaten hesabın var mı? Giriş yap



Ulgen Application

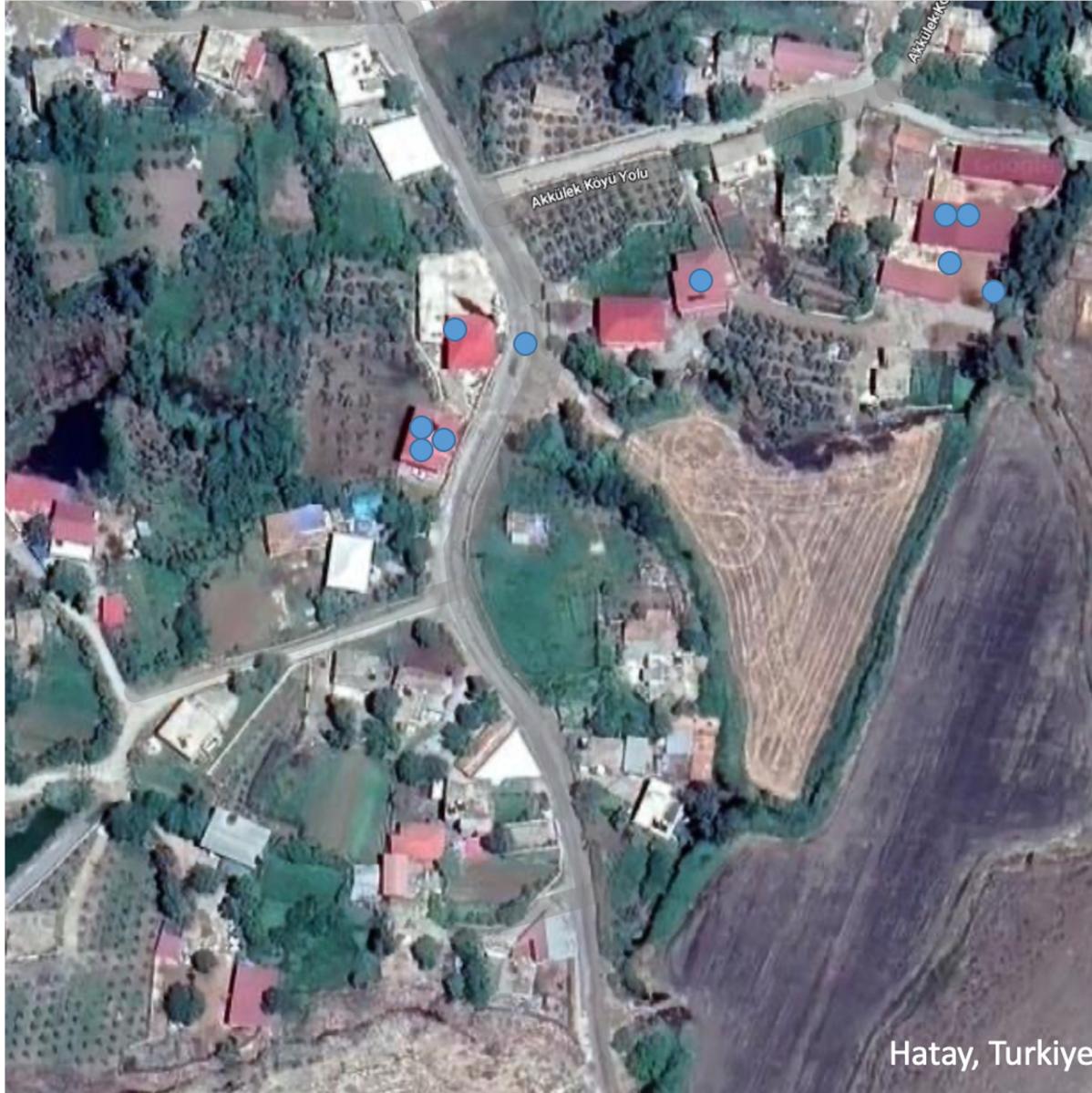
The screenshot shows the main interface of the Ulgen Application. At the top, there is a circular profile icon containing a stylized 'U' logo, followed by the greeting "Merhaba Faruk!". Below this, a progress bar indicates "Ülgen hesabı doluluk oranı: %50" with the text "hesabını tamamlamak için tıkla!" underneath. The main area is divided into several sections: a large central box labeled "Kullanıcı genel bilgiler kutusu", two smaller boxes on the left labeled "Deprem bilgilendirme kutusu" and "Günlük içerik kutusu/görsel içerik", and a single box on the right labeled "Alarm/dündük sesi tuşu(?)". At the bottom, there is a navigation bar with four icons: a map, a house, a person, and a gear.



The screenshot shows a screen for reporting an emergency contact. It features a large blue button at the top with the number "2" indicating the count of contacts found. Below this, the text "Taşıtınızın bulunduğu" is displayed above the coordinates "41.205616 Enlem" and "29.073708 Boylam". Further down, the question "Önceliğiniz ne?" is shown with three options: "En yakındaki insanlara ulaşmak istiyorum", "İkisi de", and "Olabildiğince çok insana ulaşmak istiyorum". At the bottom is a large blue "Tamam" button, and at the very bottom is a navigation bar with four icons: a map, a house, a person, and a gear.

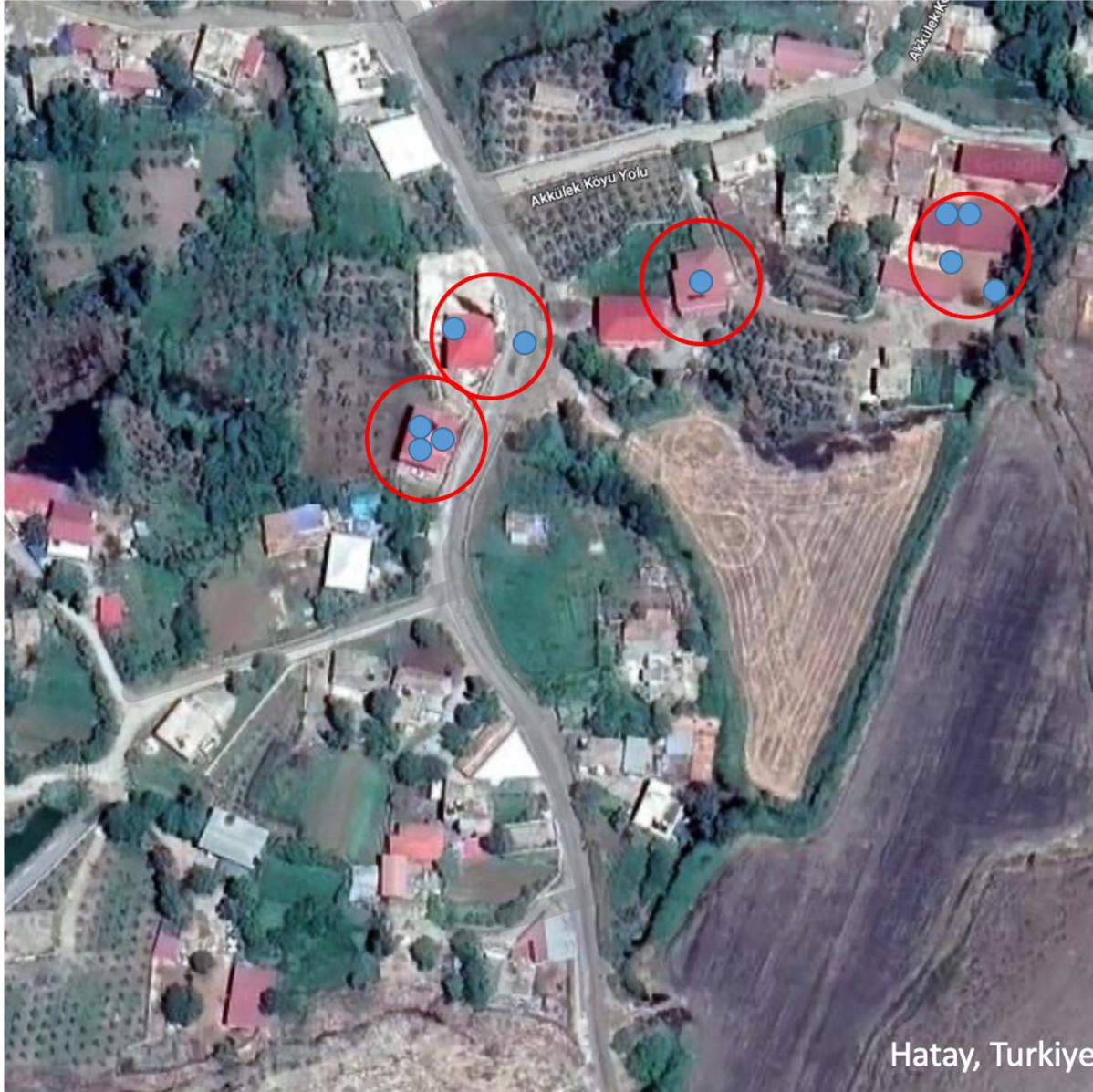


Visualization - Google-OR - Data Collection





Visualization - Google-OR - Clustering



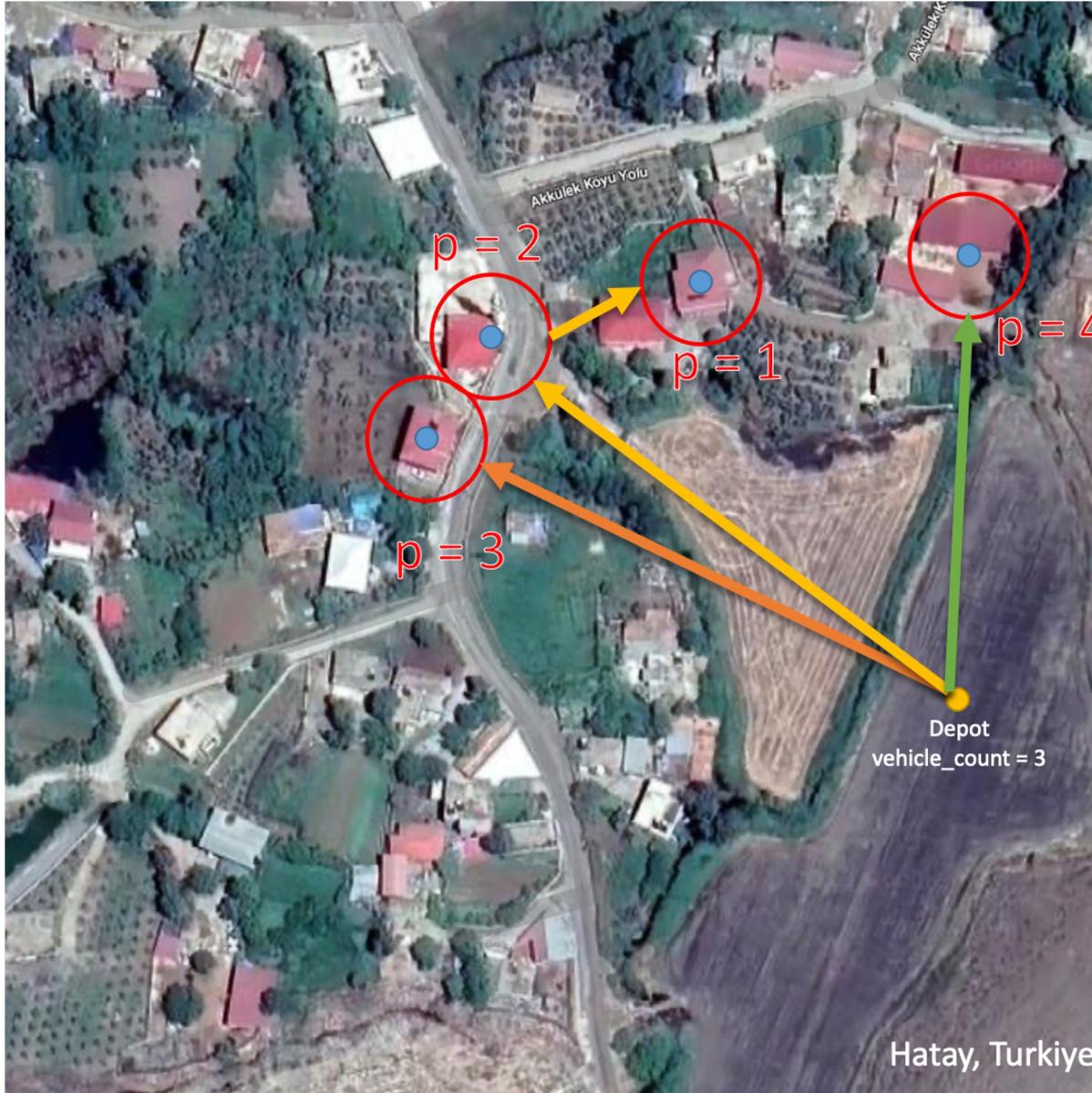


Visualization - Google-OR - Priority Assignment



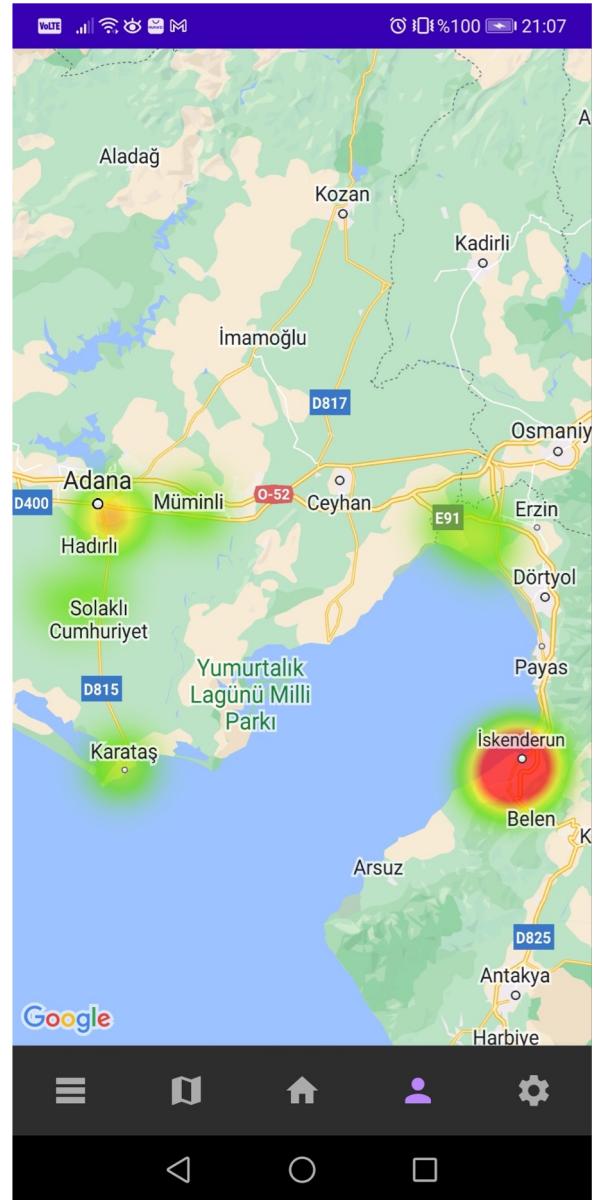
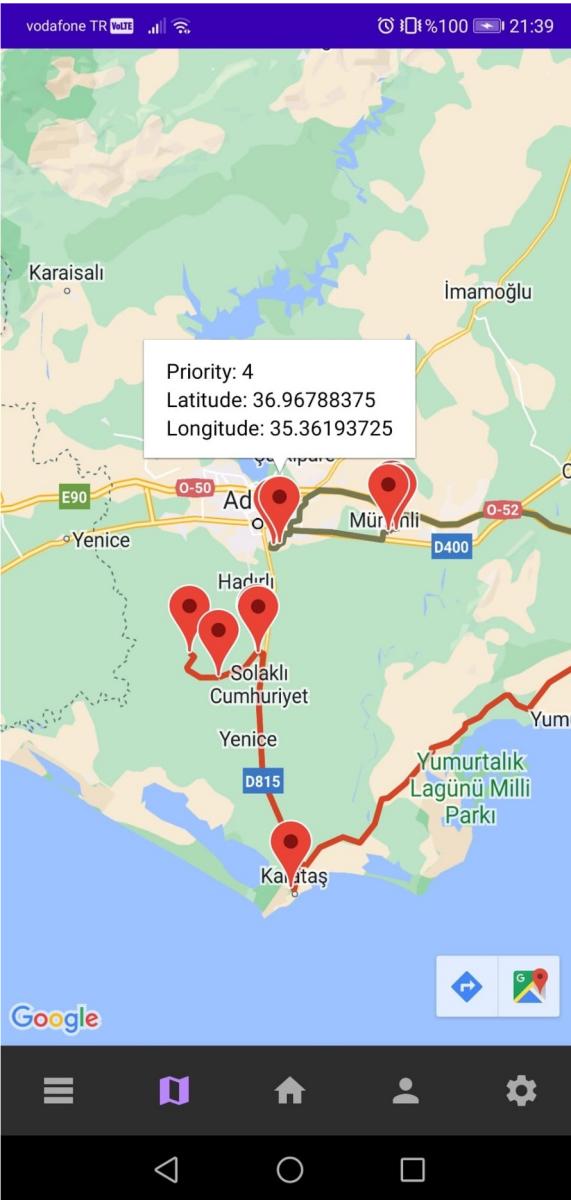
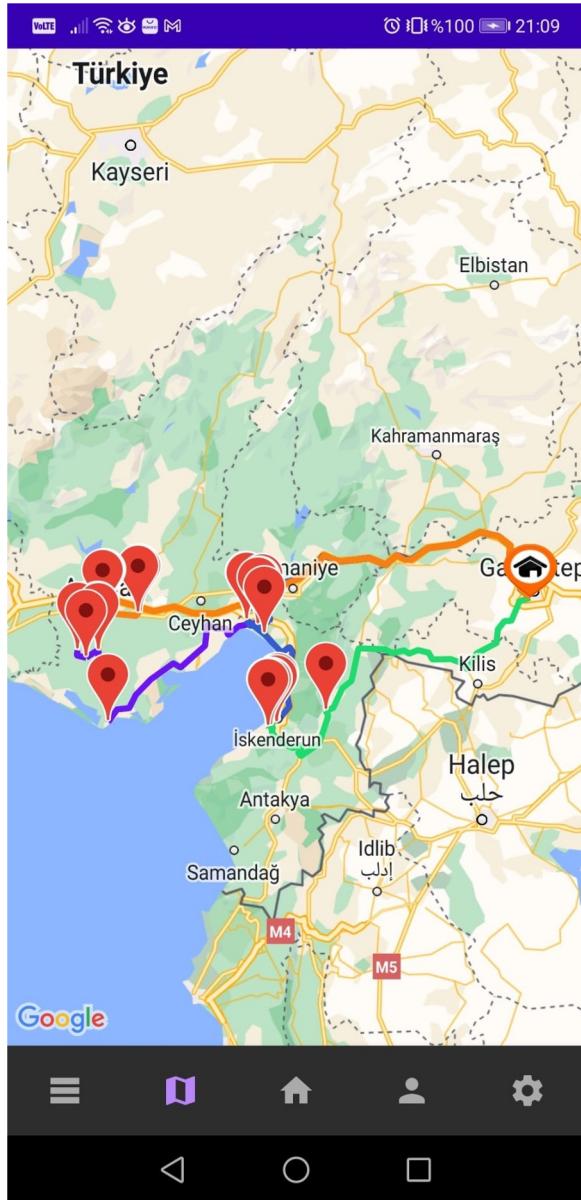


Visualization - Google-OR - Routing





Routing / Heatmap





Latest Earthquakes - Kandilli Rasathanesi

6:35 ⚠️ 🔍 ☀️



Region: DARENDE (MALATYA)

Date: 2023-05-16 20:03:09

Magnitude: 2.6

Region: POLAT-DOGANSEHIR (MALATYA)

Date: 2023-05-16 18:34:18

Magnitude: 2.2

Region: SOFULAR-(HATAY)

Date: 2023-05-16 18:24:30

Magnitude: 1.8

Region: YALINTAS-ELBISTAN (KAHRAMANMARAS)

Date: 2023-05-16 18:20:38

Magnitude: 2.5

Region: KAZANDERE-GOKSUN (KAHRAMANMARAS)

Date: 2023-05-16 18:01:14

Magnitude: 1.9

Region: GULUMUSAGI-(MALATYA)

Date: 2023-05-16 17:27:53

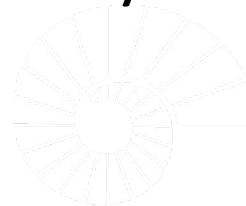
Magnitude: 2.2





Data Collection

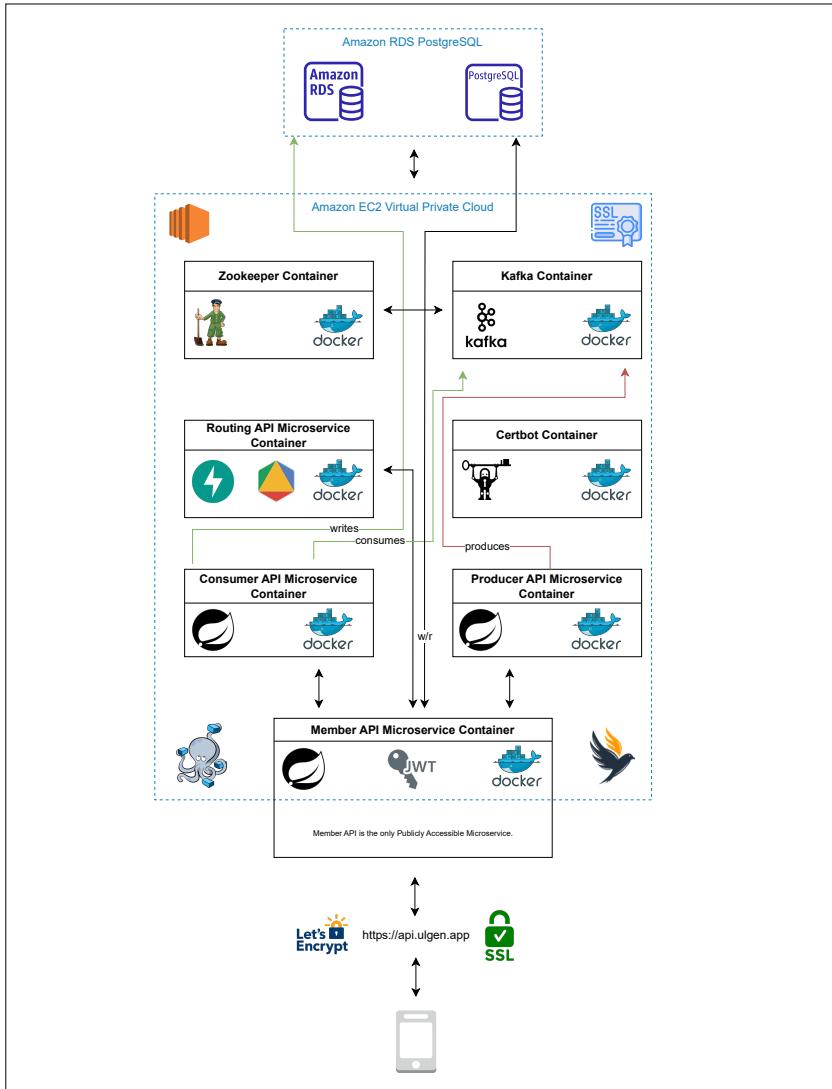
- ARP Table
- Gathering MAC Address Periodically
- Classifying Mobile Devices



Neighbour	Linklayer Address	Expire (O)	Expire (I) Netif	Refs	Prbs
10.0.0.1	0:c:29:12:34:56	2m25s	2m25s	en0	1 none
10.0.0.41	0:c:29:65:43:21	39s	39s	en0	1 none
10.0.0.47	0:c:00:00:00:01	1m14s	1m14s	en0	1 none
10.0.0.53	ab:cd:ef:81:6:72	2m32s	2m32s	en0	1 none
10.0.0.58	fe:dc:ba:11:e2:6e	1m51s	1m51s	en0	1 none



Architecture Diagram





Testing

- Unit Testing
- Load Testing
- Chaos Testing



JUnit 5

mockito



Load Testing



```
kaan@turkmen load_tests.ulgen % k6 run member_routing_api_load_test.js
  _/\_ [VZ] .io
execution: local
script: member_routing_api_load_test.js
output: -
scenarios: (100.00%)
  * default: Up to 200 looping VUs for 7m0s over 4 stages (gracefulRampDown: 30s, gracefulStop: 30s)

  █ API Test
    ✓ status is 200
      ✓ response body is not empty

    checks...
      data_received...: 100.00% < 11454   x 0
      data_received...: 7.2 MB 17 kB/s
      duration...: 2.7 m 0.0s
      http_req_blocked...: avg=10.33ms min=3us med=5us max=613.07ms p(90)=3us p(95)=14us
      http_req_connecting...: avg=4.94ms min=8s med=9s max=262.04ms p(90)=3s p(95)=0s
      http_req_duration...: avg=10.33ms min=3us med=5us max=613.07ms p(90)=3us p(95)=14us
      http_req_error...: 0.00% 0 / 0
      http_req_failed...: 0.00% 0 / 5727
      http_req_receiving...: avg=399.74us min=3us med=9us max=913.37ms p(90)=79us p(95)=1.17ms
      http_req_sending...: avg=140.01us min=15us med=15us max=142.42ms p(90)=15us p(95)=17.22s
      http_req_tls_handshaking...: avg=8.37ms min=8s med=9s max=196.46ms p(90)=8s p(95)=0s
      http_req_waiting...: avg=76 min=213.72ms med=4.9s max=35.92s p(90)=14.42s p(95)=17.22s
      iteration_duration...: avg=8.01s min=1.21s med=6.91s max=36.93s p(90)=15.43s p(95)=18.23s
iterations...: 5727 13.592139/s
vus...: 1
vus_max...: 200 min=1 max=200
running (7m01.2s), 000/200 VUs, 5017 complete and 0 interrupted iterations
default: [=====] 000/200 VUs 7m0s
ERR[0x422] thresholds on metrics 'http_req_duration' have been breached
kaan@turkmen load_tests.ulgen %
```

stages: [
 { duration: '1m', target: 50 },
 { duration: '3m', target: 200 },
 { duration: '2m', target: 100 },
 { duration: '1m', target: 0 },
]

```
kaan@turkmen load_tests.ulgen % k6 run --out json=routing_api_load_test_result.json routing_api_load_test.js
  _/\_ [VZ] .io
execution: local
script: routing_api_load_test.js
output: json (routing_api_load_test_result.json)
scenarios: (100.00%)
  * default: Up to 200 looping VUs for 7m0s over 4 stages (gracefulRampDown: 30s, gracefulStop: 30s)

  █ API Test
    ✓ status is 200
      ✓ response body is not empty

    checks...
      data_received...: 100.00% < 10036   x 0
      data_received...: 4.0 MB 9.5 kB/s
      duration...: 2.7 m 0.0s
      group_duration...: avg=145.17ms min=32.6ms med=141.63ms max=344.14ms p(90)=146.76ms p(95)=147.74ms
      http_req_blocked...: avg=5.44ms min=3us med=7us max=208.50ms p(90)=7us p(95)=8us
      http_req_connecting...: avg=5.62ms min=8s med=9s max=308.96ms p(90)=8s p(95)=0s
      http_req_duration...: avg=8.31ms min=204.67ms med=9.01s max=40.69s p(90)=14.48 p(95)=14.59s
      http_req_error...: 0.00% 0 / 0
      http_req_failed...: 0.00% 0 / 5814
      http_req_receiving...: avg=180.84us min=27us med=80us max=2.57ms p(90)=109us p(95)=1.12ms
      http_req_sending...: avg=43.66us min=18us med=45us max=943us p(90)=53us p(95)=6.14us
      http_req_tls_handshaking...: avg=8s min=8s med=8s max=8s p(90)=8s p(95)=0s
      http_req_waiting...: avg=140.27us min=9us med=10us max=1.57ms p(90)=6us p(95)=4us
      iteration_duration...: avg=7.15s min=1.2s med=10.01s max=41.84s p(90)=15.4s p(95)=15.59s
iterations...: 5617 11.933246/s
vus...: 2
vus_max...: 200 min=1 max=200
running (7m00.4s), 000/200 VUs, 5017 complete and 2 interrupted iterations
default: [=====] 000/200 VUs 7m0s
ERR[0x421] thresholds on metrics 'http_req_duration' have been breached
kaan@turkmen load_tests.ulgen %
```

stages: [
 { duration: '1m', target: 50 },
 { duration: '3m', target: 200 },
 { duration: '2m', target: 100 },
 { duration: '1m', target: 0 },
]

```
kaan@turkmen load_tests.ulgen % k6 run --out json=producer_api.load_test_result.json producer_api.load_test.js
  _/\_ [VZ] .io
execution: local
script: producer_api.load_test.js
output: json (producer_api.load_test_result.json)
scenarios: (100.00%)
  * default: Up to 100 looping VUs for 7m0s over 4 stages (gracefulRampDown: 30s, gracefulStop: 30s)

  █ API Test
    ✓ status is 200
      ✓ response body is not empty

    checks...
      data_received...: 100.00% < 36294   x 0
      data_received...: 3.8 MB 9.1 kB/s
      duration...: 2.7 m 0.0s
      group_duration...: avg=145.17ms min=32.6ms med=141.63ms max=344.14ms p(90)=146.76ms p(95)=147.74ms
      http_req_blocked...: avg=5.44ms min=3us med=7us max=208.50ms p(90)=7us p(95)=8us
      http_req_connecting...: avg=5.62ms min=8s med=9s max=308.96ms p(90)=8s p(95)=0s
      http_req_duration...: avg=141.21ms min=32.45ms med=141.42ms max=390.85ms p(90)=146.39ms p(95)=147.33ms
      http_req_error...: 0.00% 0 / 18147
      http_req_failed...: 0.00% 0 / 18147
      http_req_receiving...: avg=180.84us min=27us med=80us max=2.57ms p(90)=109us p(95)=1.12ms
      http_req_sending...: avg=43.66us min=18us med=45us max=943us p(90)=53us p(95)=6.14us
      http_req_tls_handshaking...: avg=8s min=8s med=8s max=8s p(90)=8s p(95)=0s
      http_req_waiting...: avg=140.27us min=9us med=10us max=1.57ms p(90)=6us p(95)=4us
      iteration_duration...: avg=7.14s min=1.19s med=1.14s max=1.34s p(90)=1.14s p(95)=1.14s
iterations...: 5617 11.939871/s
vus...: 1
vus_max...: 100 min=1 max=100
running (7m00.9s), 000/100 VUs, 18147 complete and 0 interrupted iterations
default: [=====] 000/100 VUs 7m0s
kaan@turkmen load_tests.ulgen %
```

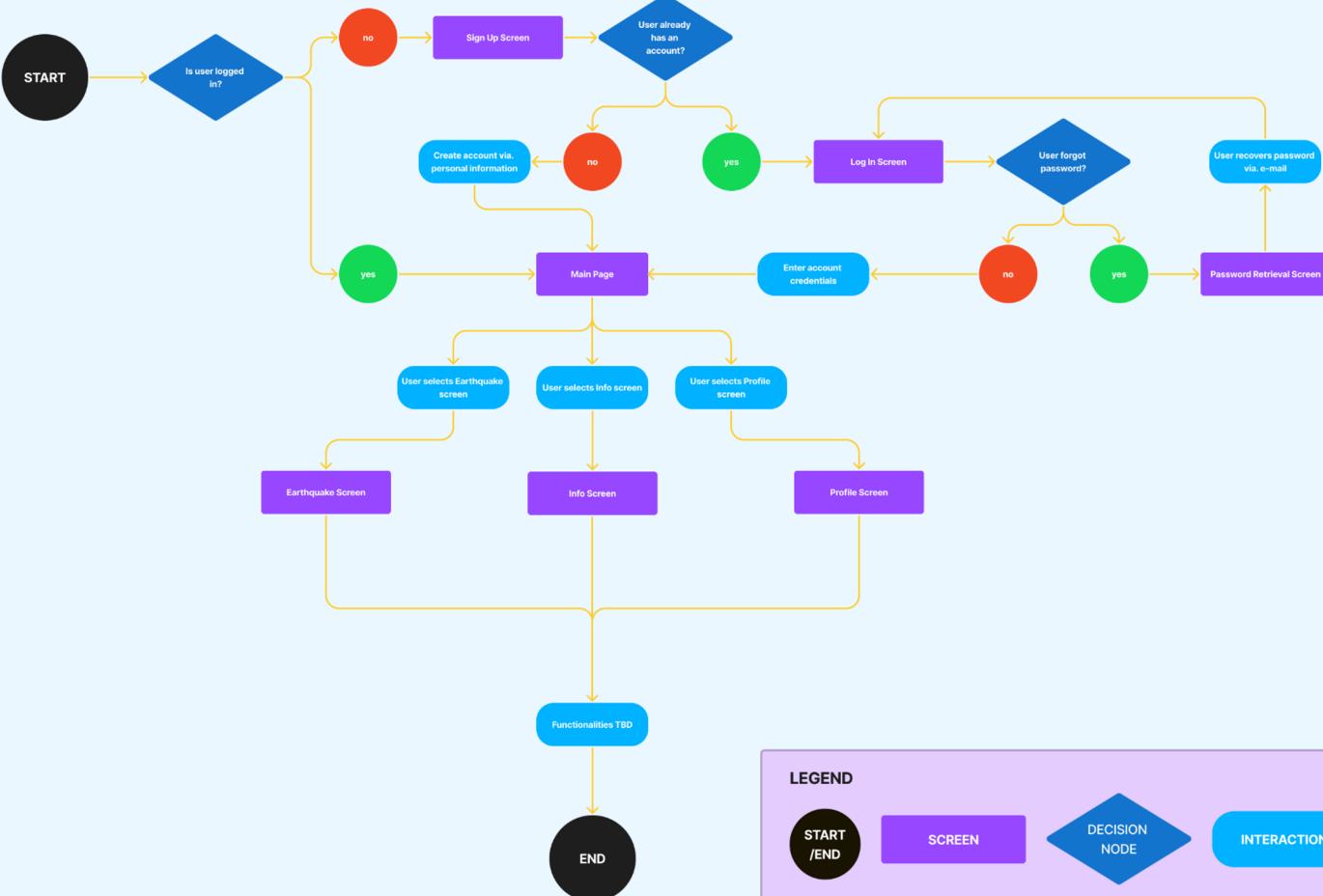
stages: [
 { duration: '1m', target: 10 },
 { duration: '3m', target: 100 },
 { duration: '2m', target: 50 },
 { duration: '1m', target: 0 },
]



User Flow

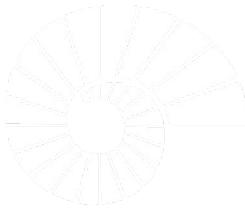
User flow: Setting up an Ülgen account.

Scenario: Faruk, a father of two, lives in a risky zone and is conscious about earthquakes, and thus wants to create an Ülgen account for himself and his family, as well as check out the applications functionalities.





Live Demo



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