Computer Network Term Project

Using TCP Communication, KakaoTalk Messenger

2022. 12. 14. Wes

Team A

Members – Team A

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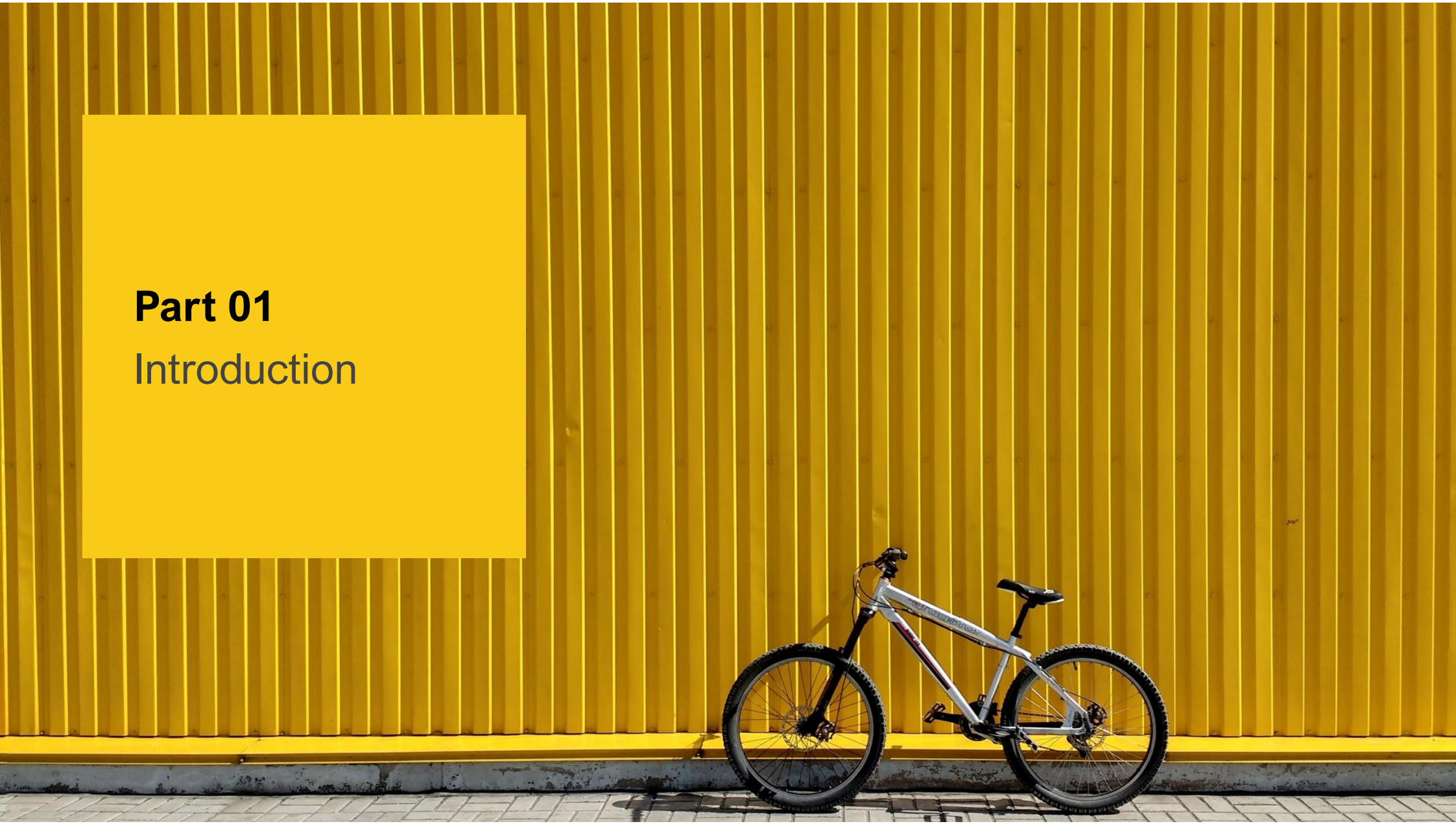


Part 01

Introduction

part 01

Simple Online Messenger

Requirements

1. Resister & Unregister
2. Login
3. Manage my status
4. Manage friend status
5. Chatting room(real-time and multi)
6. Using Public data

Part 02,

Structure

REST (= Representational state Transfer)

1. What is REST?

1) REST refers to sending and receiving the state of a resource, separated by a name.
2) It's an architectural style that takes full advantage of the Web's advantages by leveraging the Web's existing technology and HTTP protocol.
3) It's one of the communication methods between Client and Server on a network.

2. Characteristics of REST

1) It has 'Server – Client Structure', and the one who has the resource becomes the Server, and the one who requests the resource become the Client.
2) Less dependence on each other's dependence.

REST API (= Representational state Transfer API)

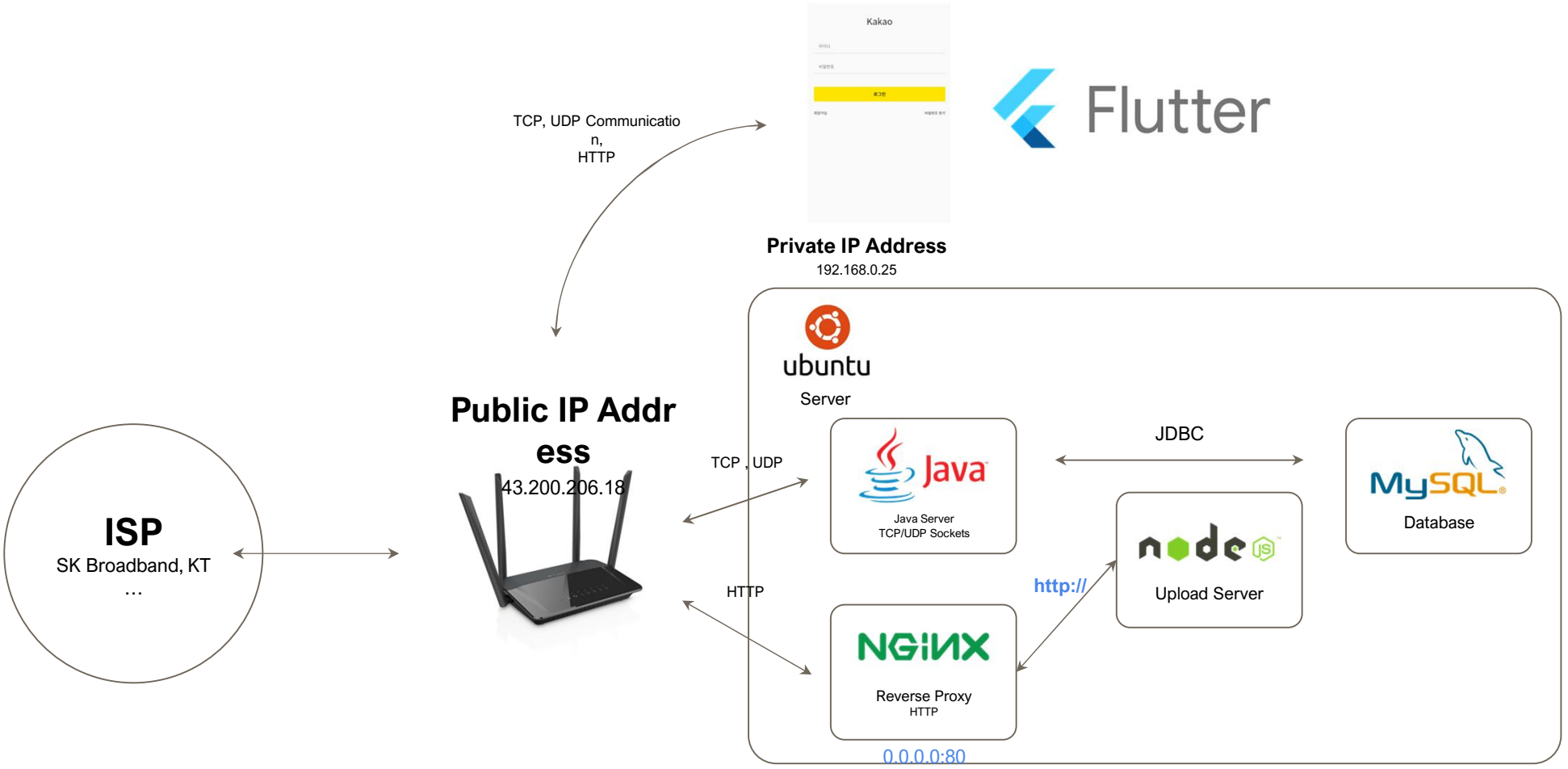
1. Characteristics of REST API

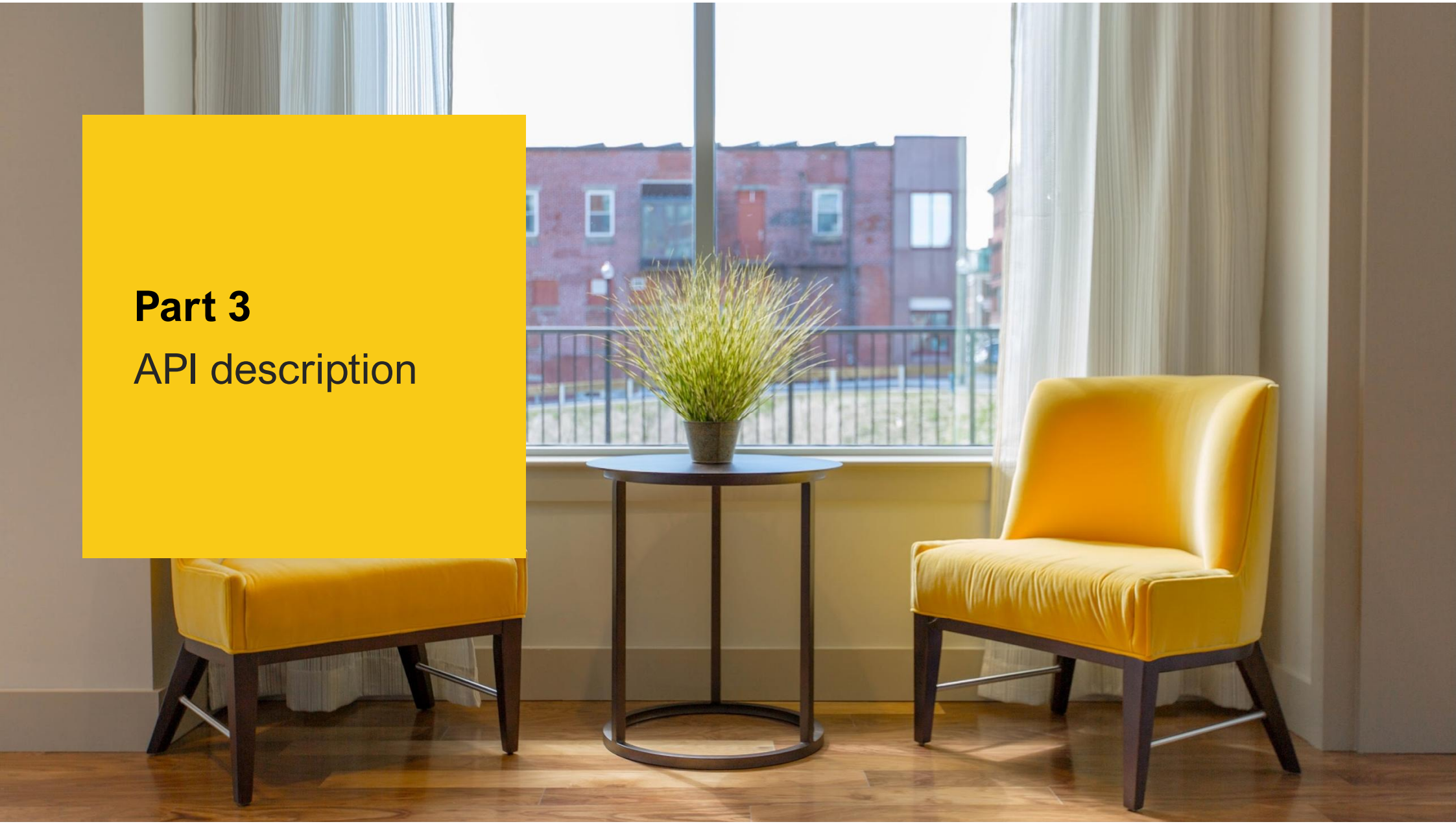
It’s implemented based on HTTP standards, allowing clients and servers to be implemented in program languages that support HTTP.

2. REST API Design Rules

CRUD	HTTP verbs	Route
Display a list of resources	GET	/resource
resource Displays the contents of one resource	GET	/resource/:id
Create resource	POST	/resource
Modify resource	PUT	/resource/:id
Delete resource	DELETE	/resource/:id

Our Project Structure



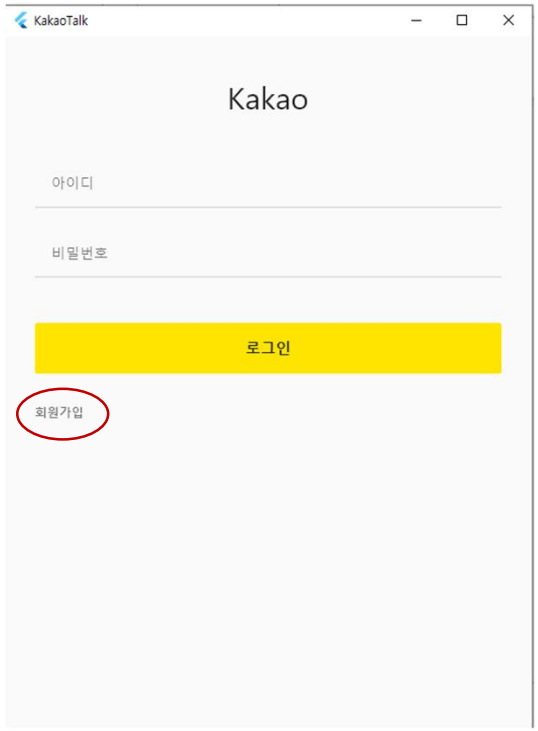


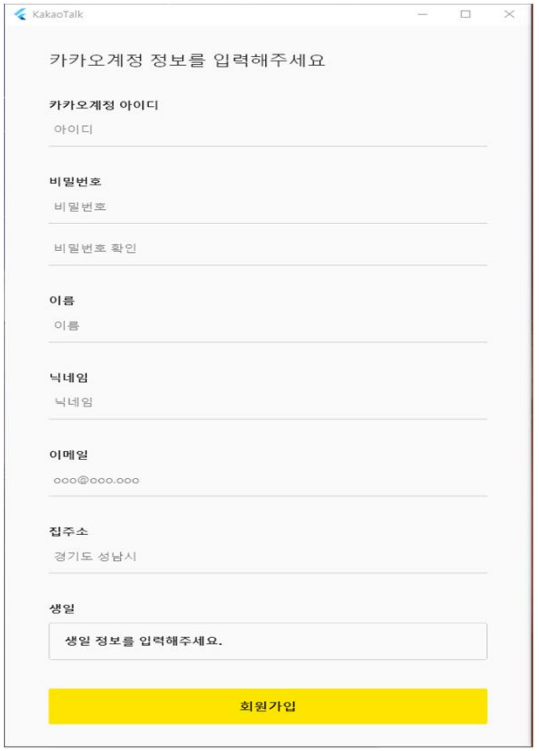
Part 3

API description

1. Register API

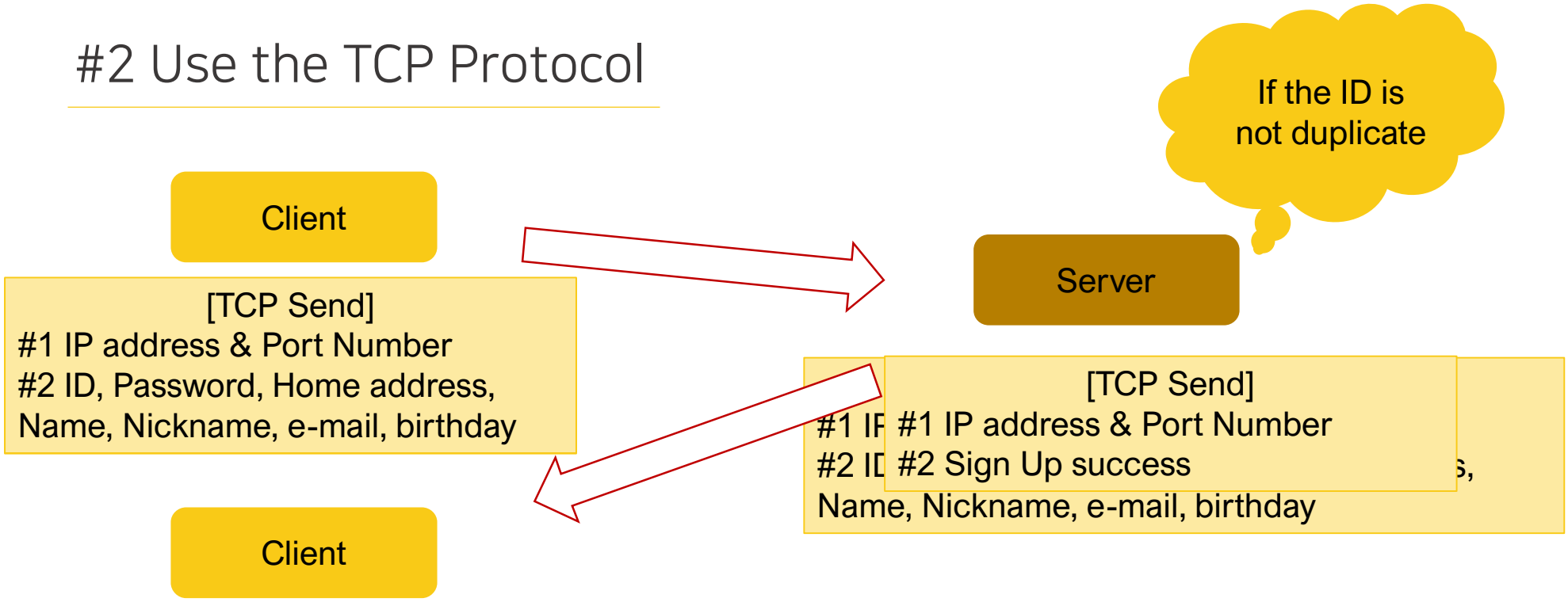
#1 Sign Up Page





1. Register API

#2 Use the TCP Protocol



1. Register API

#3 REST API Structure

Password Encryption Processing!

```
[TCP Receive]
IP:/127.0.0.1 Port#:52428
method: POST
route: register
{"birthday":"2016-5-11","pass":"8d969eef6ecad3c29a3a629280e686cf0c3f5d5a86aff3ca12020c923adc6c92","homeaddress":"경기도 성남시","name":"gachon02","nickname":"modangE2","id":"gachon02","email":"gachon02@gachon.ac.kr"}
------------------------------------------------
------------------------------------------------
[TCP Send]
IP:/127.0.0.1 Port#:52428
statusCode: 200 statusMessage: OK
data:
null
------------------------------------------------
[TCP Receive]
IP:/127.0.0.1 Port#:52429
method: POST
route: login
{"password":"8d969eef6ecad3c29a3a629280e686cf0c3f5d5a86aff3ca12020c923adc6c92","id":"gachon02"}
------------------------------------------------
[TCP Send]
IP:/127.0.0.1 Port#:52429
statusCode: 200 statusMessage: OK
data:
{"birthday":"2016-05-11","name":"gachon02","nickname":"modangE2","bio":"","id":"gachon02","email":"gachon02@gachon.ac.kr","isonline":true}
------------------------------------------------
```

1. Register API

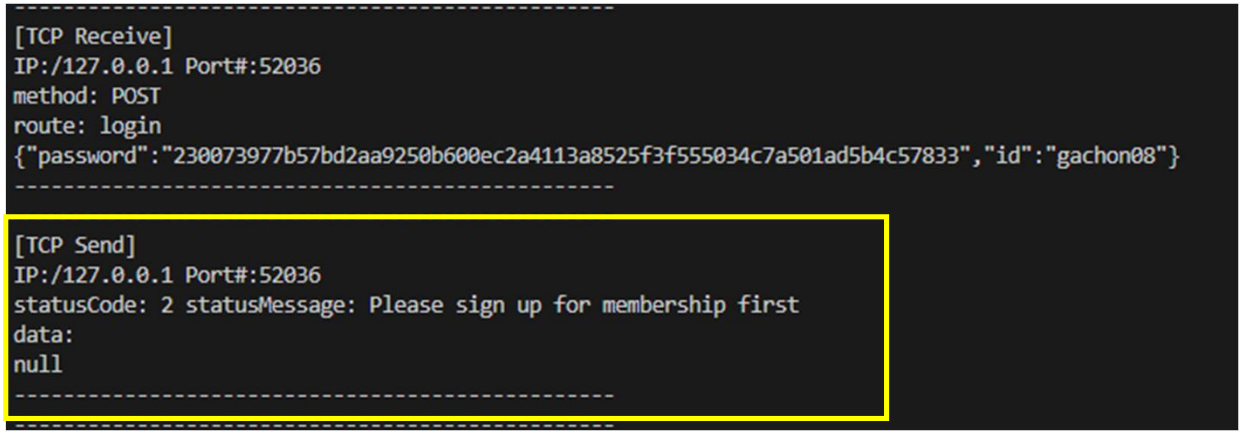
#4 User Table data set

	* ID varchar(30)	* PassWord text	* Name text	* EMail text	Birthday date	TellNum int	HomeAddress varchar(100)
1	123123	XSF4q0+t…p2JXNwbn	123456	123456	2022-11-13	(NULL)	123456
2	123456789	II8YtWgN…5U7YNgqa	잼1	11	2022-08-12	(NULL)	11
3	Gachon	RxG81pM…K+JGkaMi	gachon	gachon@gachon.ac.kr	2012-03-02	(NULL)	경기도 성남시 수정구 성

Encryption using SHA256-CBC.

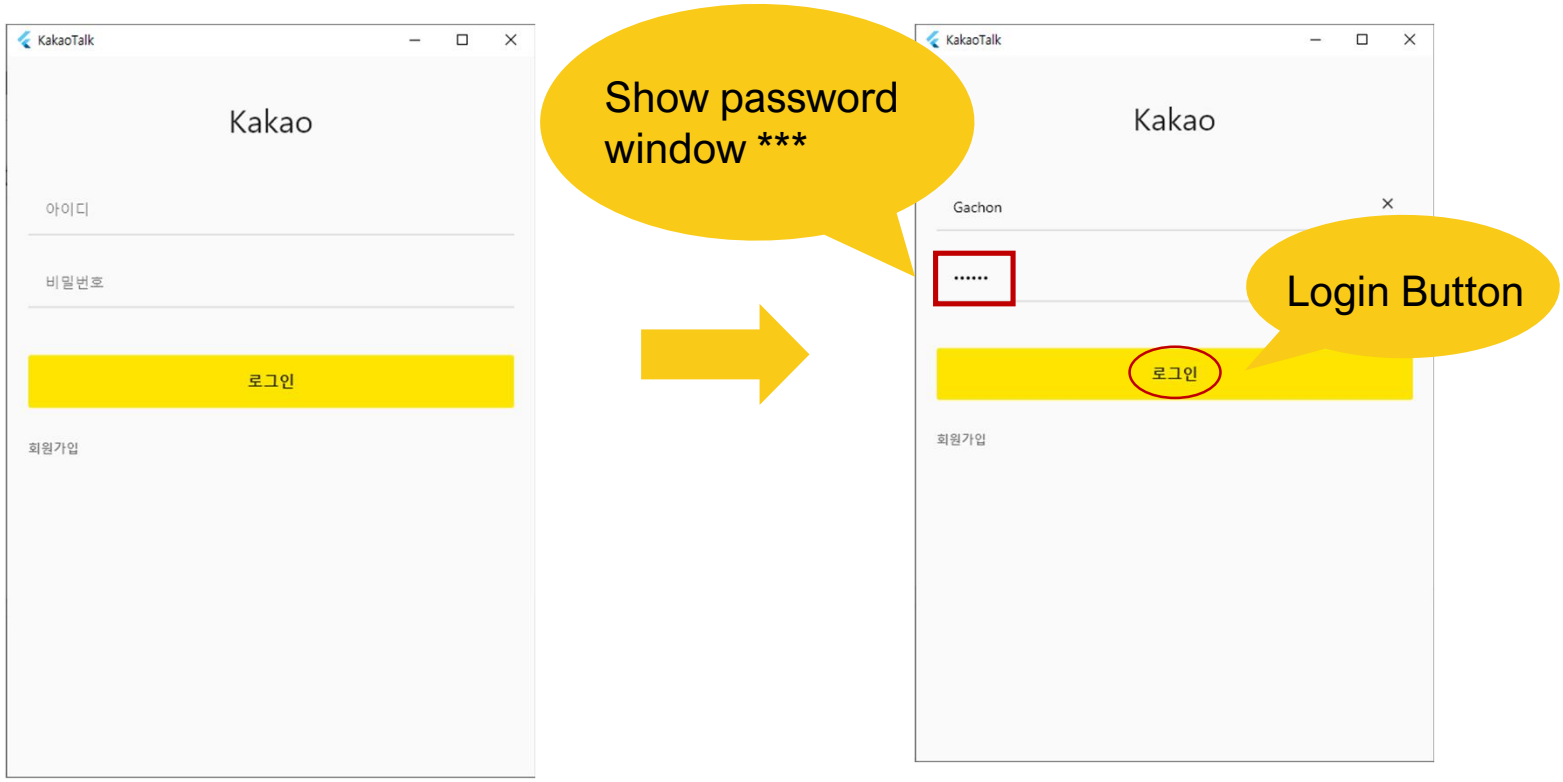
2. Unregister API

4. Unregister confirmed



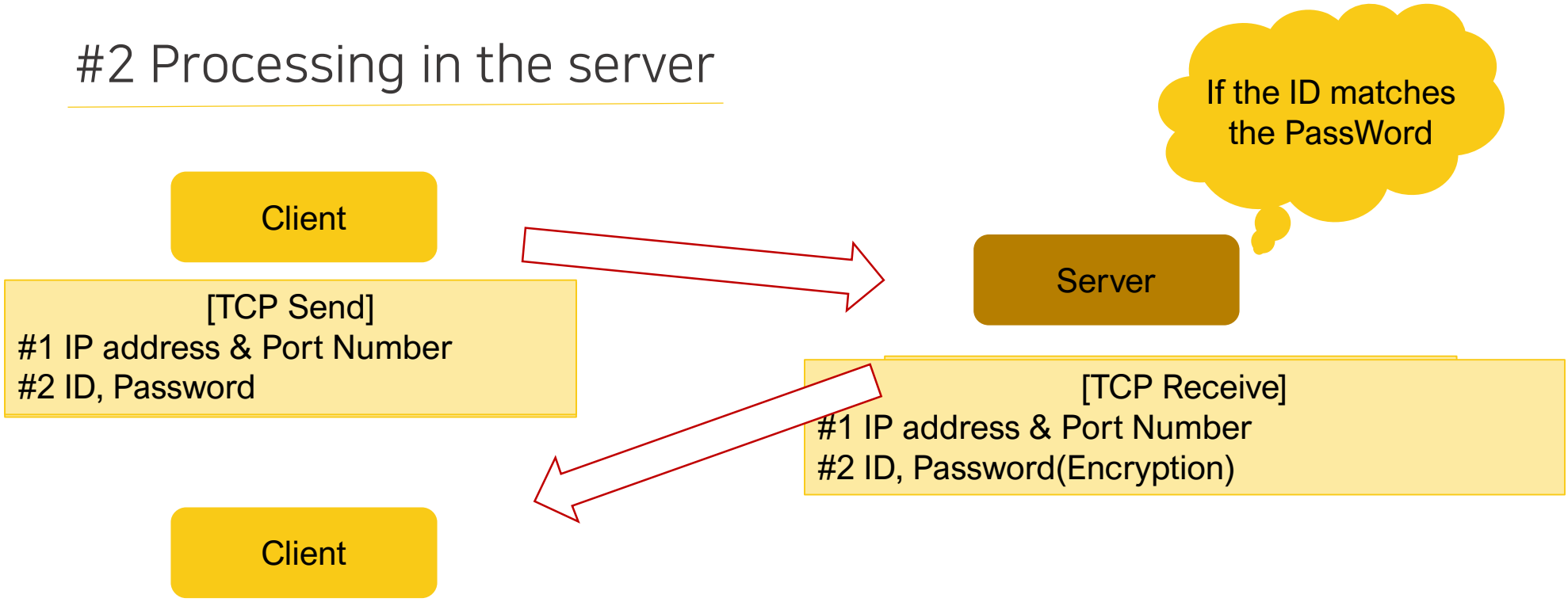
3. Login API

#1 Implement Login Window



3. Login API

#2 Processing in the server



3. Login API

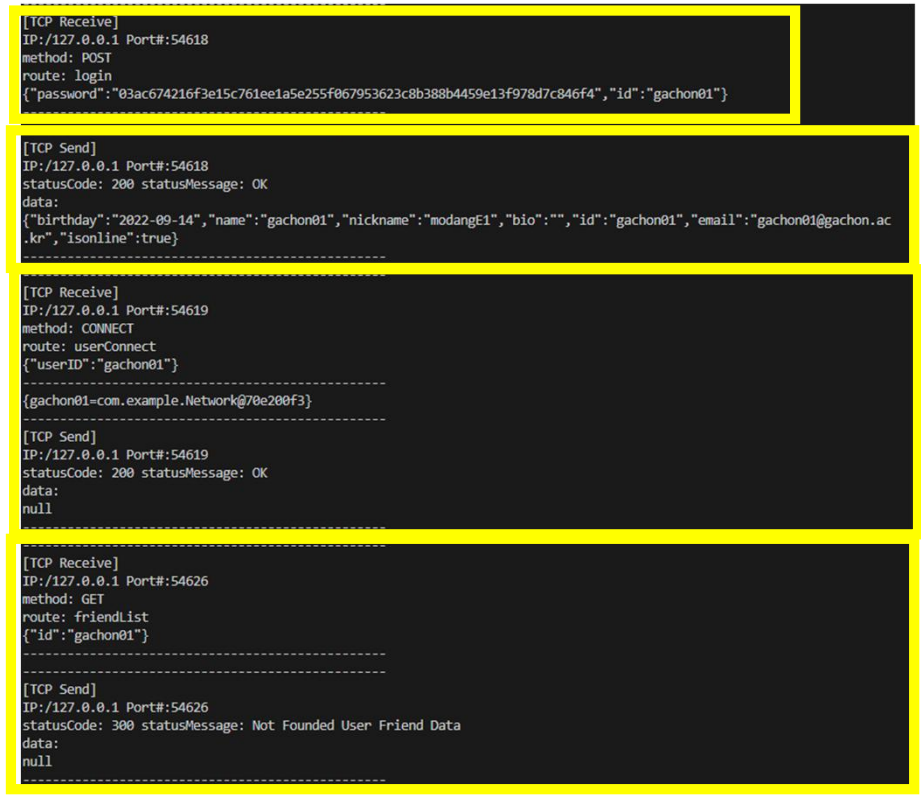
#3 REST API Structure

1. Login connection

2. Find matching ID

3. Compare to encrypted password

4. Login connection



3. Login API

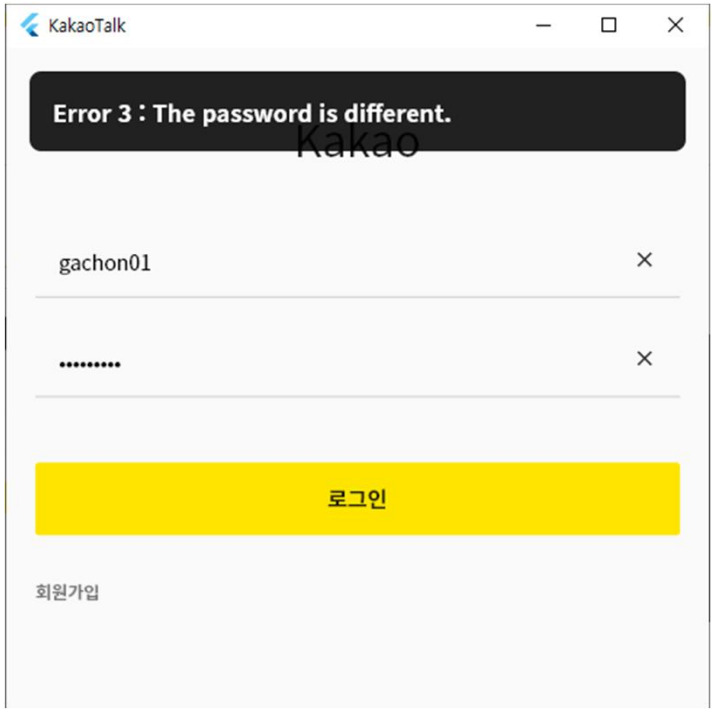
#3 REST API Structure

ID	NickName	StatusMessage	ConnectionStatus	ResentlyConnectionTime	NumberofLogins	ResentlyLogOutTime	profile_image_id	profile_background_id
z	z		online	2022-12-14 13:27:33	2	2022-12-14 13:27:31	NULL	NULL

ID	NickName	StatusMessage	ConnectionStatus	ResentlyConnectionTime	NumberofLogins	ResentlyLogOutTime	profile_image_id	profile_background_id
z	z		offline	2022-12-14 13:27:33	2	2022-12-14 13:27:57	NULL	NULL

3. Login API

#4 Login Error Processing (Password is different)

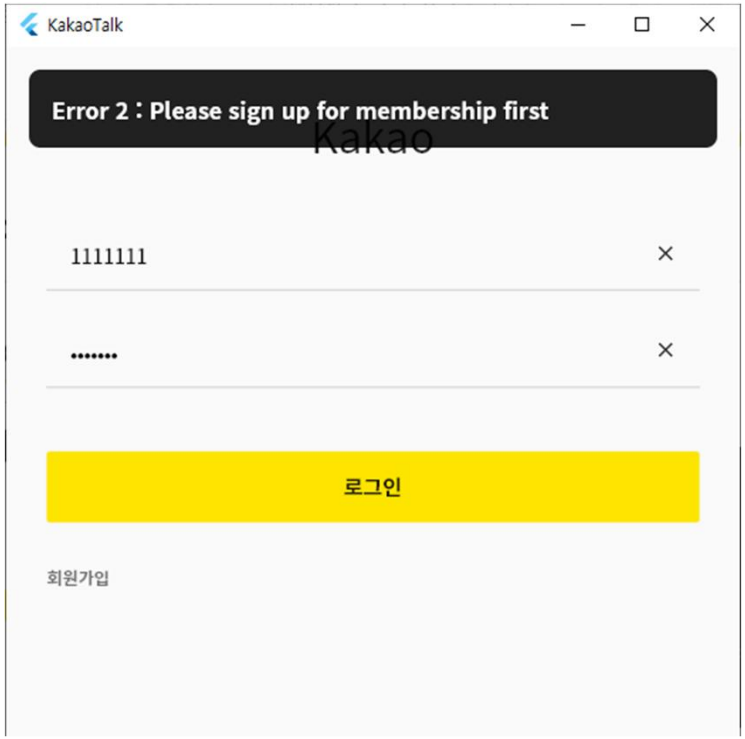



```
[TCP Receive]
IP:/127.0.0.1 Port#:55179
method: POST
route: login
{"password":"15e2b0d3c33891ebb0f1ef609ec419420c20e320ce94c65fbc8c3312448eb225","id":"gachon01"}
------------------------------------------------
[TCP Send]
IP:/127.0.0.1 Port#:55179
statusCode: 3 statusMessage: The password is different.
data:
null
------------------------------------------------
```

Error!

3. Login API

#4 Login Error Processing (ID that doesn't exist)




```
------------------------------------------------
[TCP Receive]
IP:/127.0.0.1 Port#:54902
method: POST
route: login
{"password":"2558a34d4d20964ca1d272ab26ccce9511d880579593cd4c9e01ab91ed00f325","id":"1111111"}
------------------------------------------------
[TCP Send]
IP:/127.0.0.1 Port#:54902
statusCode: 2 statusMessage: Please sign up for membership first
data:
null
------------------------------------------------
```

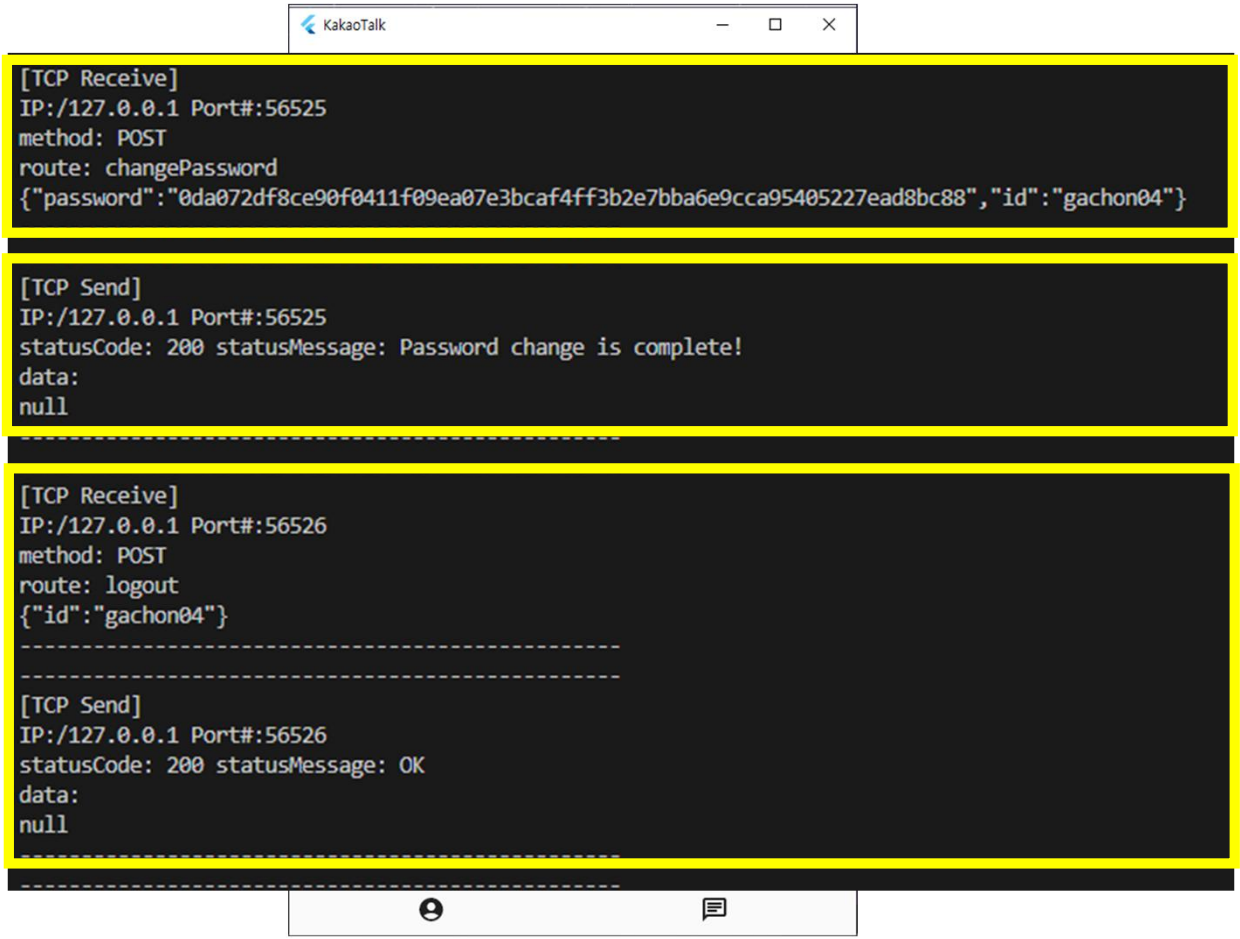
Error!

4. Change password API

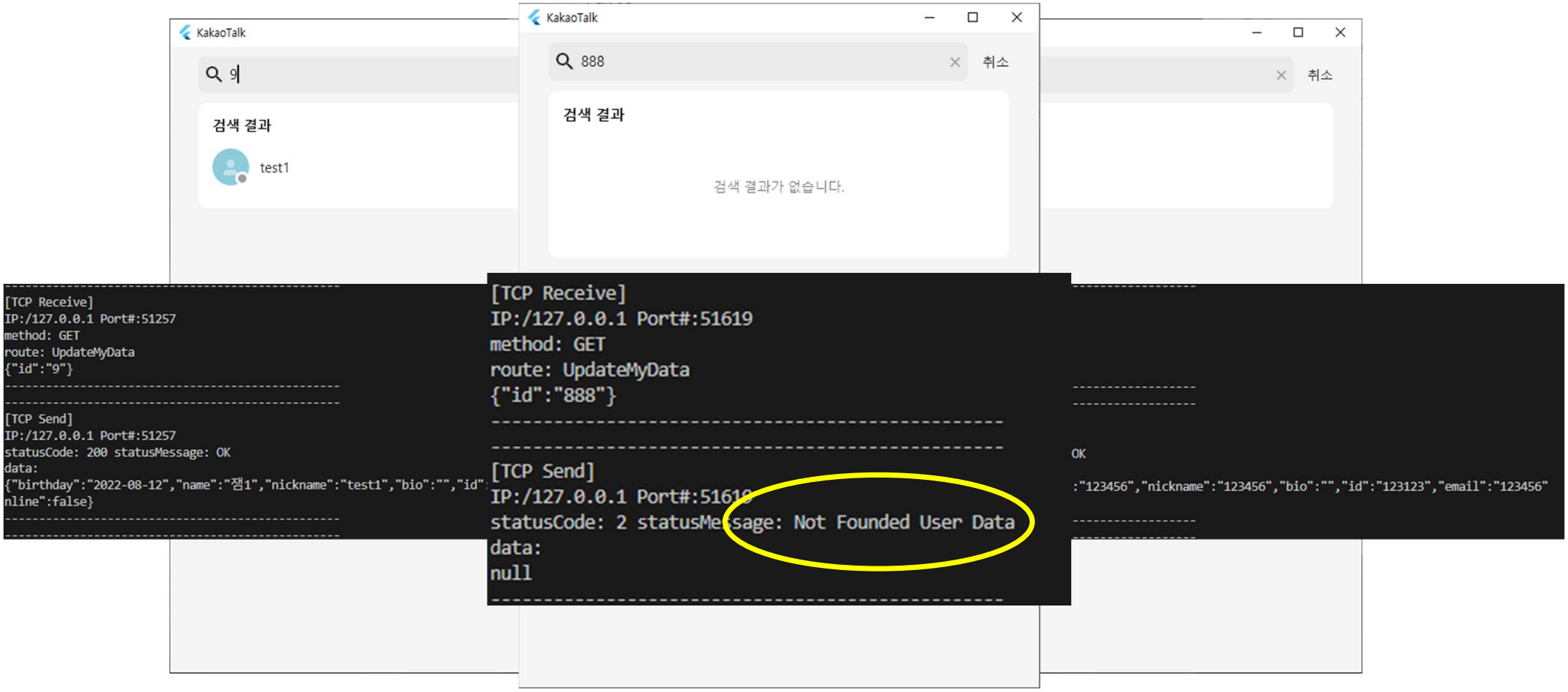
1. Client's change password connection

2. Server's change password complete

3. Change password successful & log out

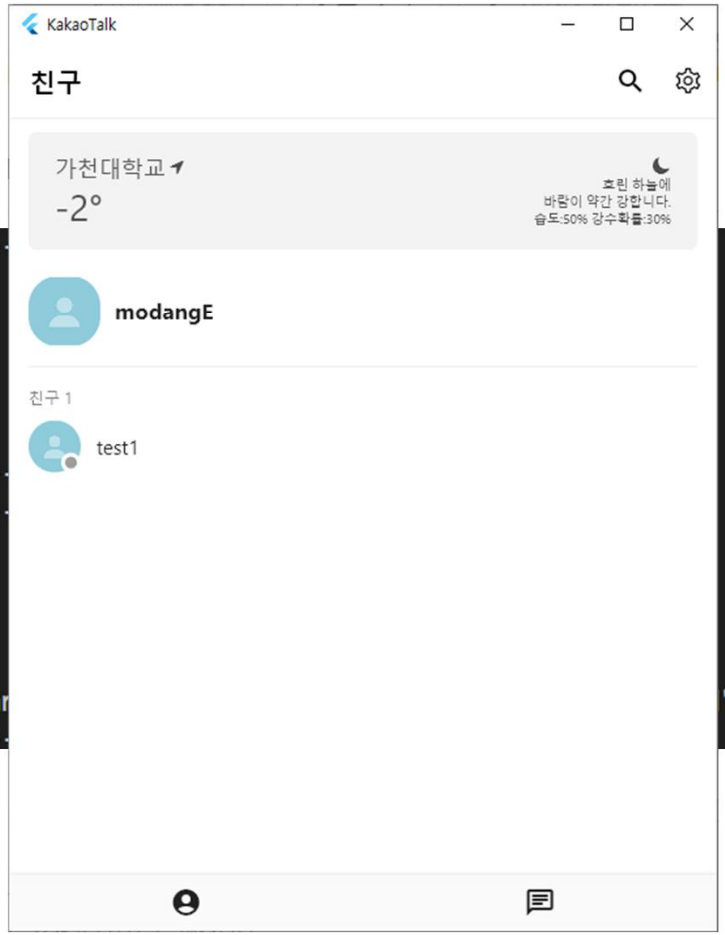


5. Add friend API

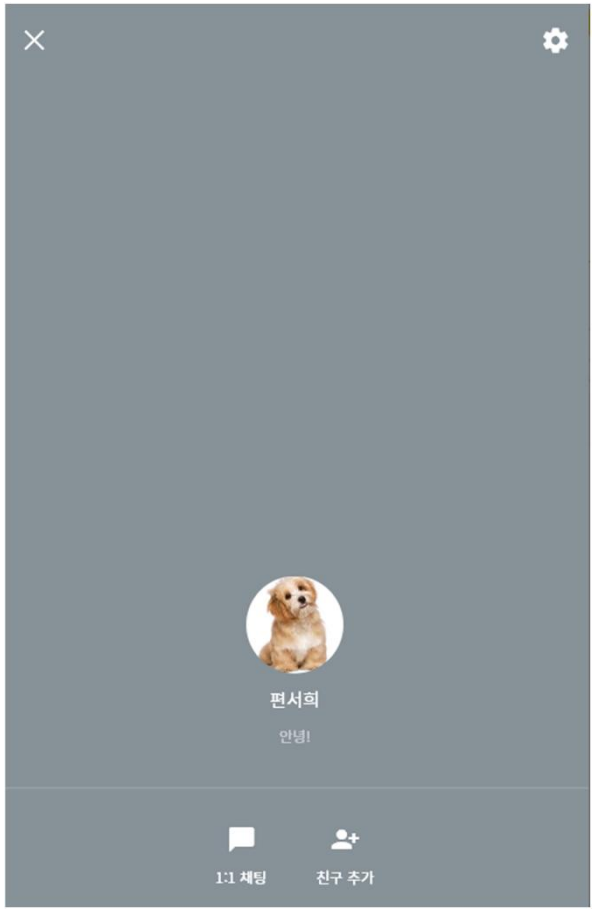


5. Add friend API

```
----------------------------------------
[TCP Receive]
IP:/192.168.0.1 Port#:8290
method: GET
route: friendList
{"id":"q"}
----------------------------------------
----------------------------------------
[TCP Send]
IP:/192.168.0.1 Port#:8290
statusCode: 200 statusMessage: OK
data:
{"datas":[{"birthday":"2022-02-14","nar                                    ":"123456789","email":"a","isonline":false}]}
----------------------------------------
```

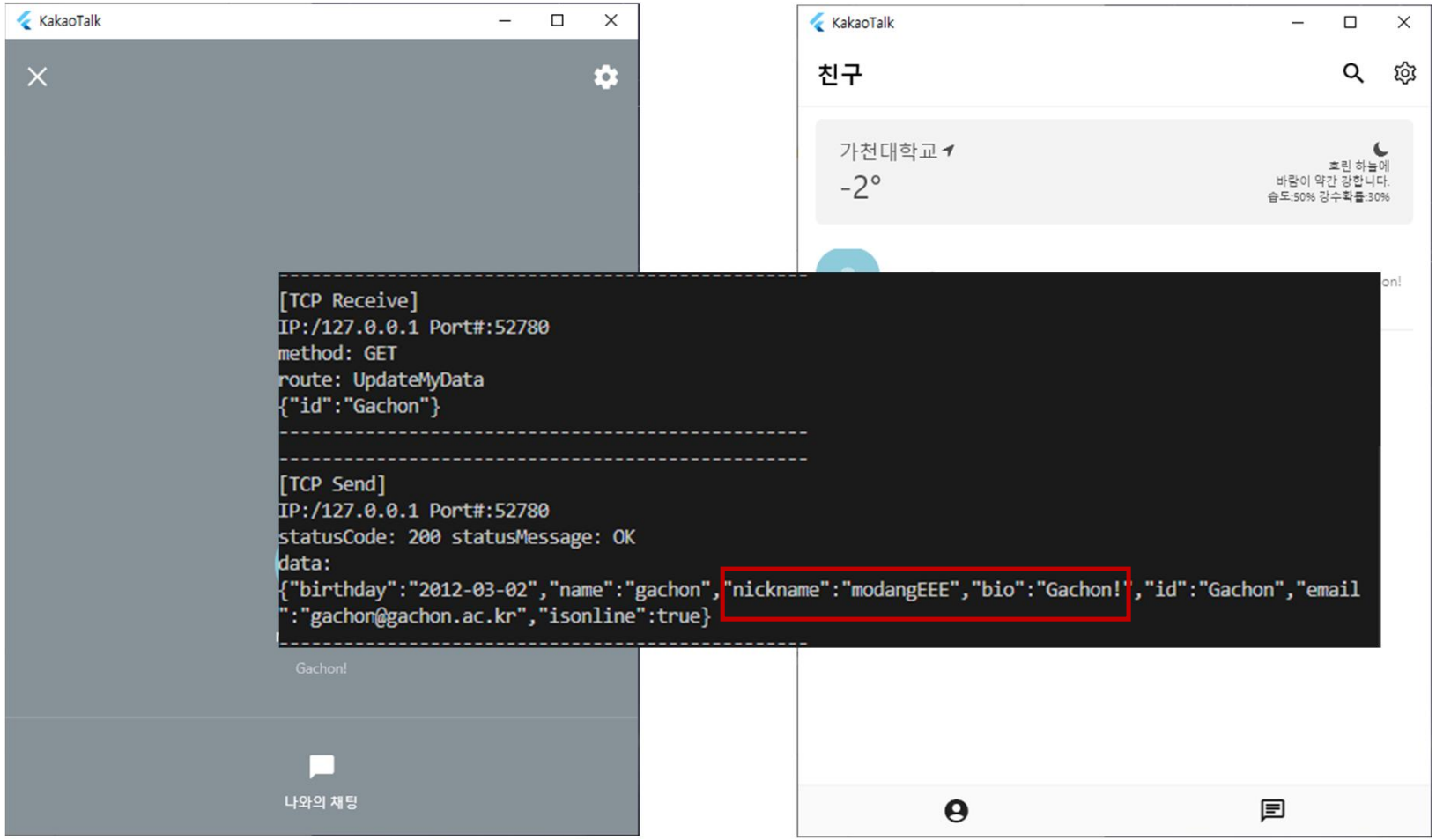


6. Delete friend API

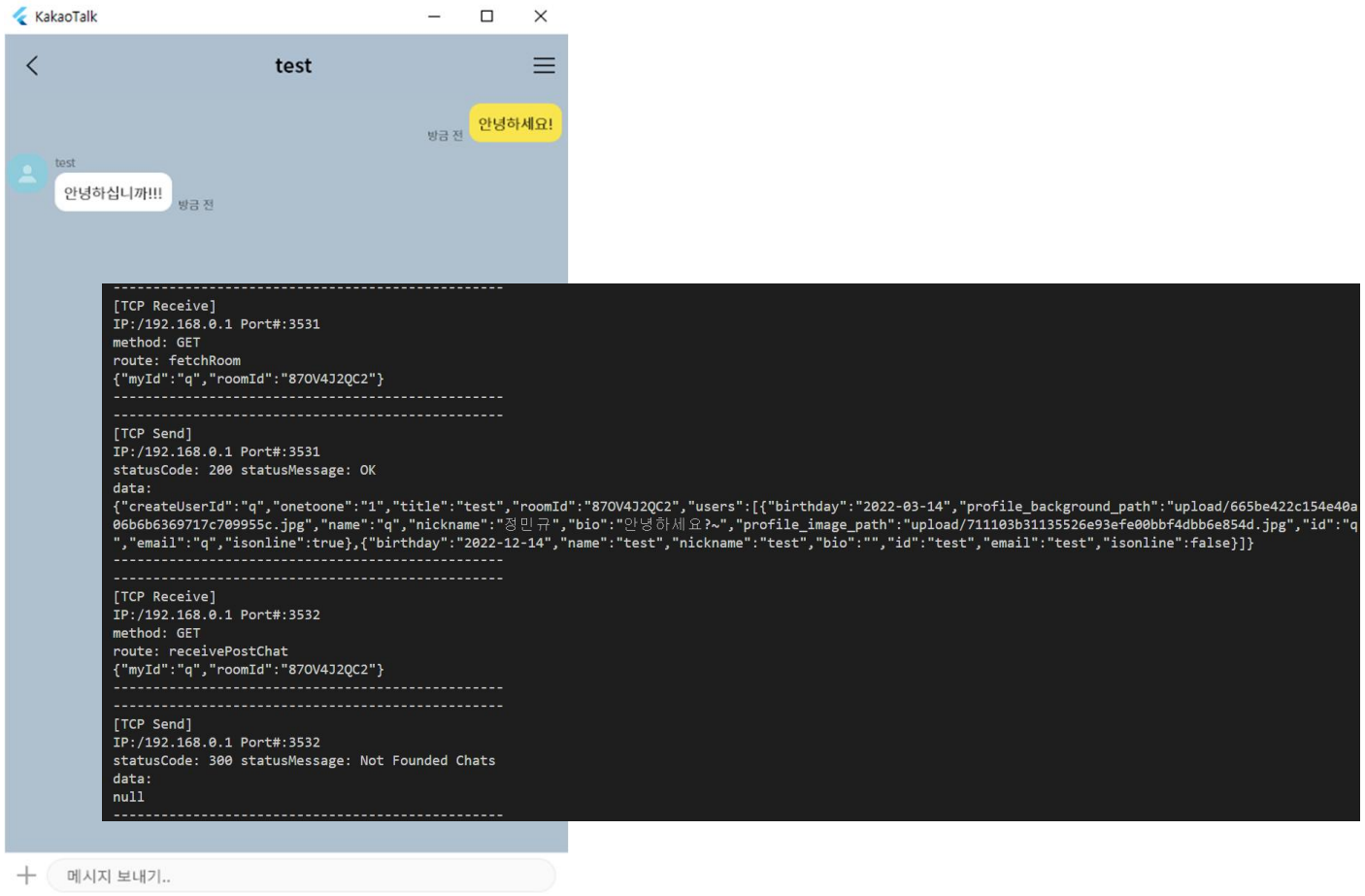



```
------------------------------------------------
[TCP Receive]
IP:/192.168.0.1 Port#:3444
method: POST
route: deleteFriend
{"myId":"q","friendId":"1234"}
------------------------------------------------
------------------------------------------------
[TCP Send]
IP:/192.168.0.1 Port#:3444
statusCode: 200 statusMessage: OK
data:
null
------------------------------------------------
```

7. Change statusMessage, nickName API



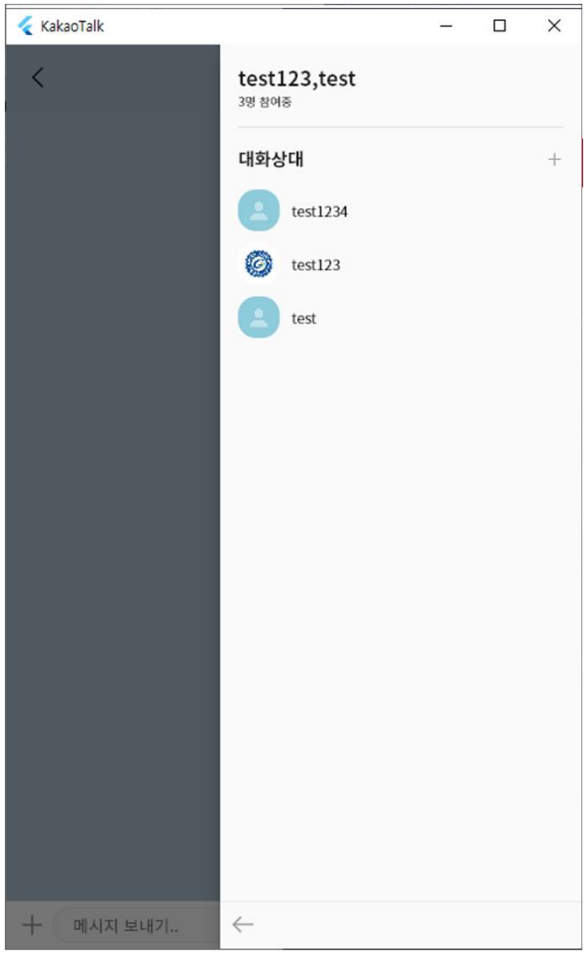
8. Create room API



9. Invite friend in chatting room API

```
------------------------------------------------
[TCP Receive]
IP:/192.168.0.1 Port#:3703
method: POST
route: createRoom
{"myId":"q","onetoone":0,"ids":["q","test1234","test"]}
------------------------------------------------
------------------------------------------------
[TCP Send]
IP:/192.168.0.1 Port#:3703
statusCode: 200 statusMessage: OK
data:
{"roomId":"11H99A6GV0"}
------------------------------------------------
```

In a one-on-one room, the invitation makes a new room.

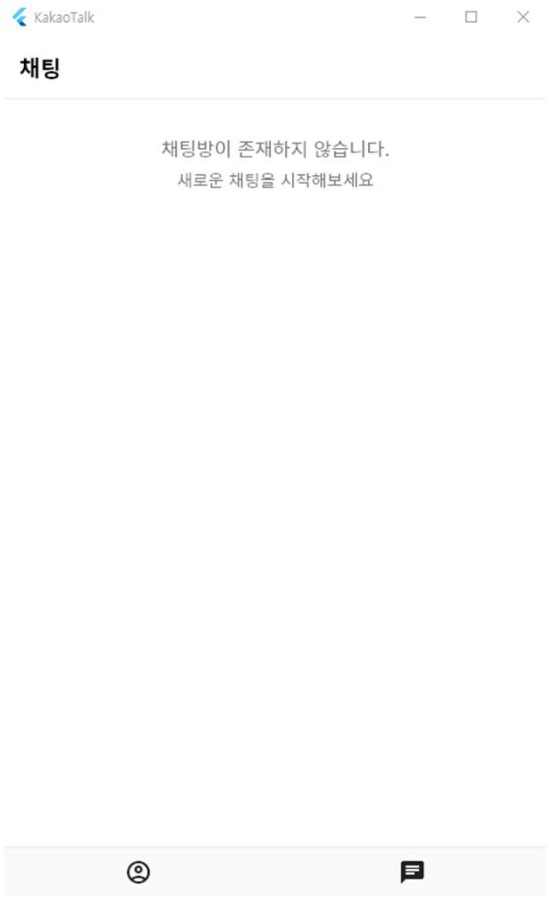



```
------------------------------------------------
[TCP Receive]
IP:/192.168.0.1 Port#:3919
method: POST
route: InvitePeople
{"Id":"123456789","roomId":"11H99A6GV0"}
------------------------------------------------
------------------------------------------------
[TCP Send]
IP:/192.168.0.1 Port#:3919
statusCode: 200 statusMessage: OK
data:
null
------------------------------------------------
```

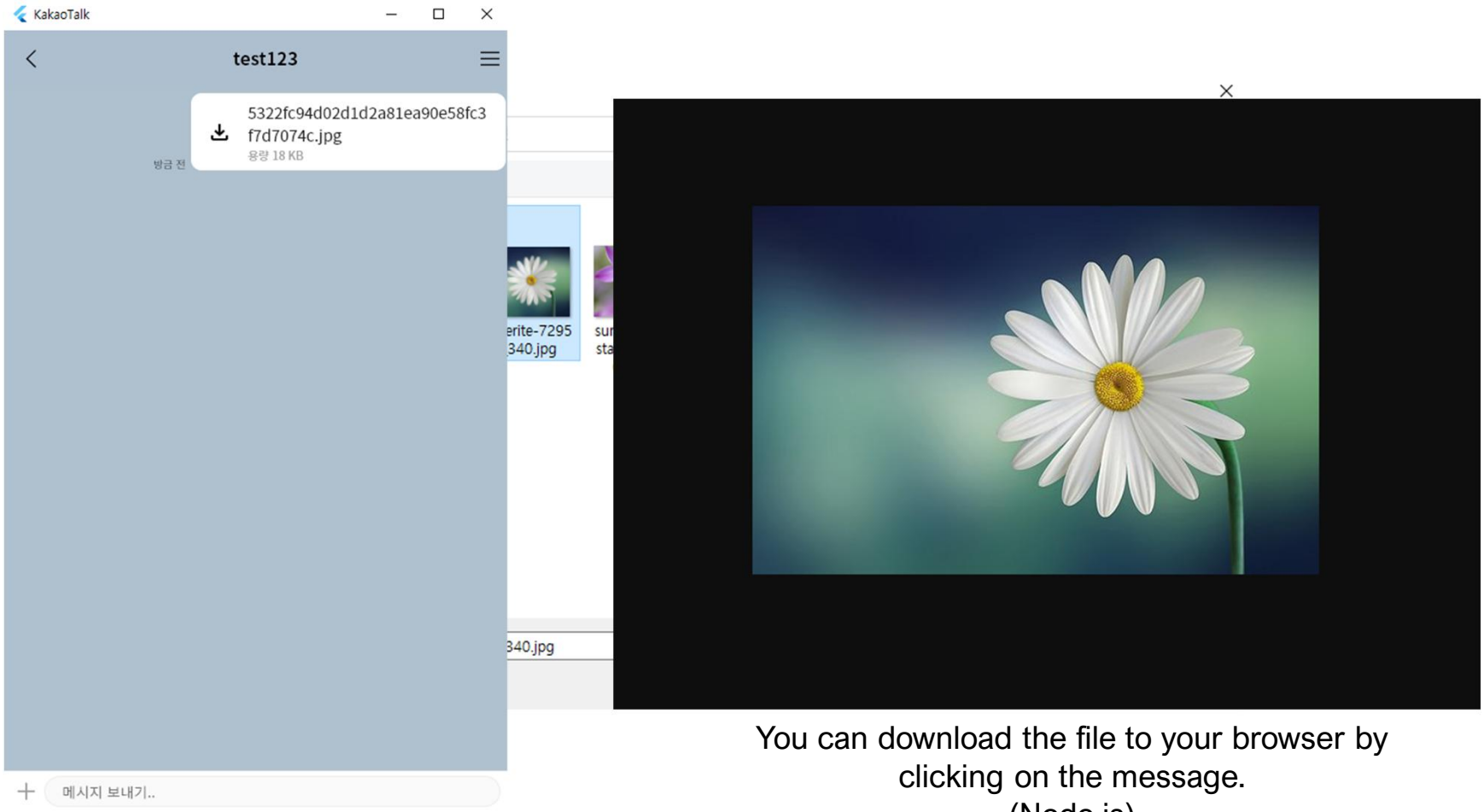
In rooms where many exist, the invitation continues with an additional member in the existing room.

10. Exit room API

```
------------------------------------------------
[TCP Receive]
IP:/192.168.0.1 Port#:4044
method: POST
route: ExitRoom
{"Id":"q","roomId":"11H99A6GV0"}
------------------------------------------------
------------------------------------------------
[TCP Send]
IP:/192.168.0.1 Port#:4044
statusCode: 200 statusMessage: OK
data:
null
------------------------------------------------
```



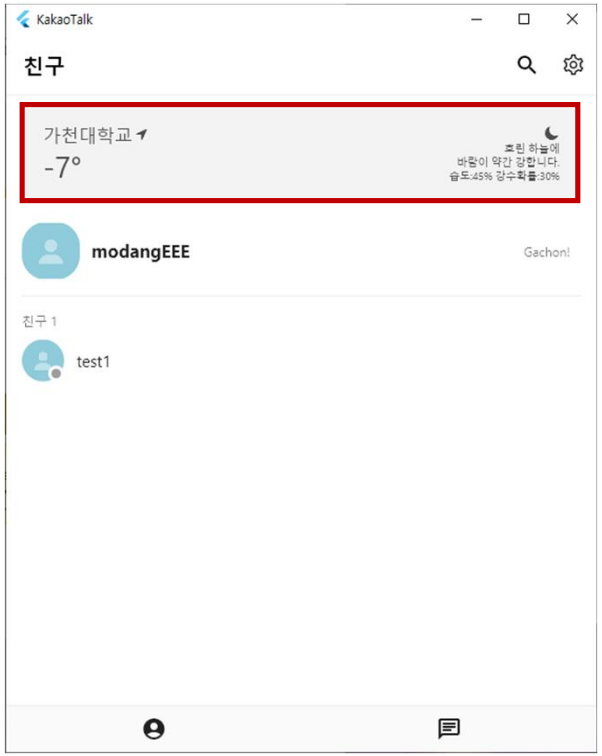
11. File Transfer API



You can download the file to your browser by clicking on the message.
(Node.js)

12. Using public data

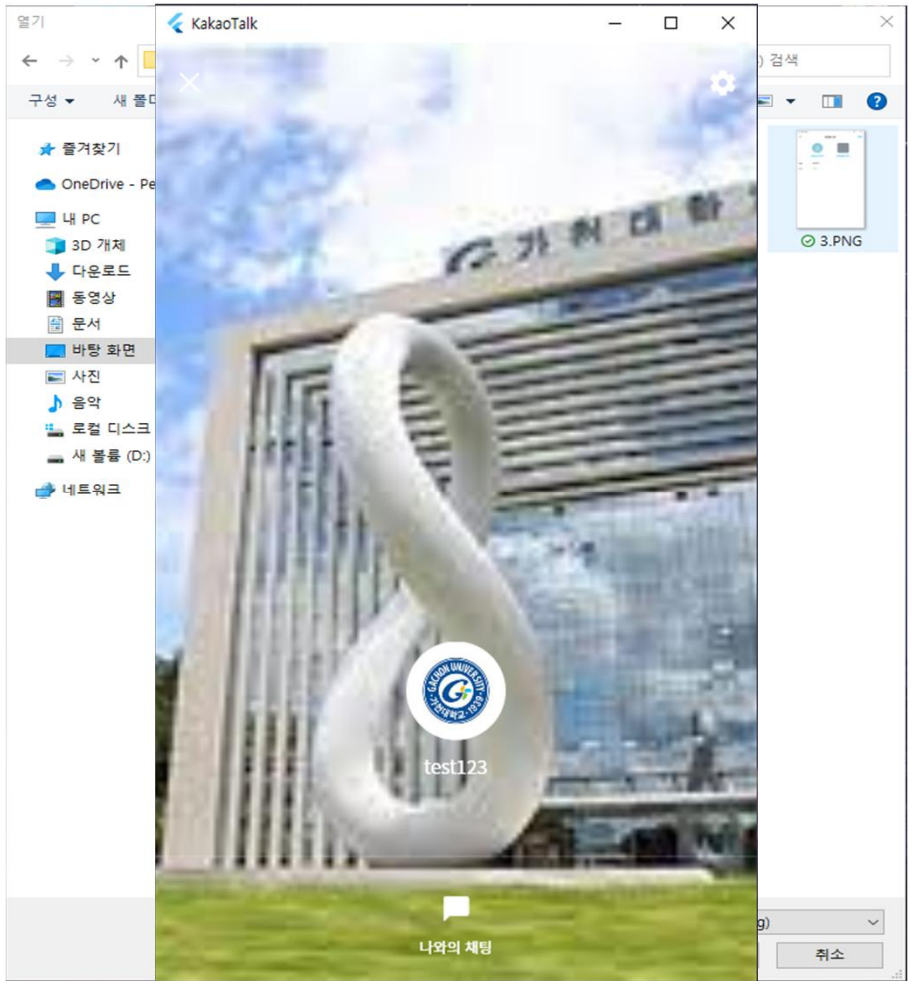
#1 Today's weather



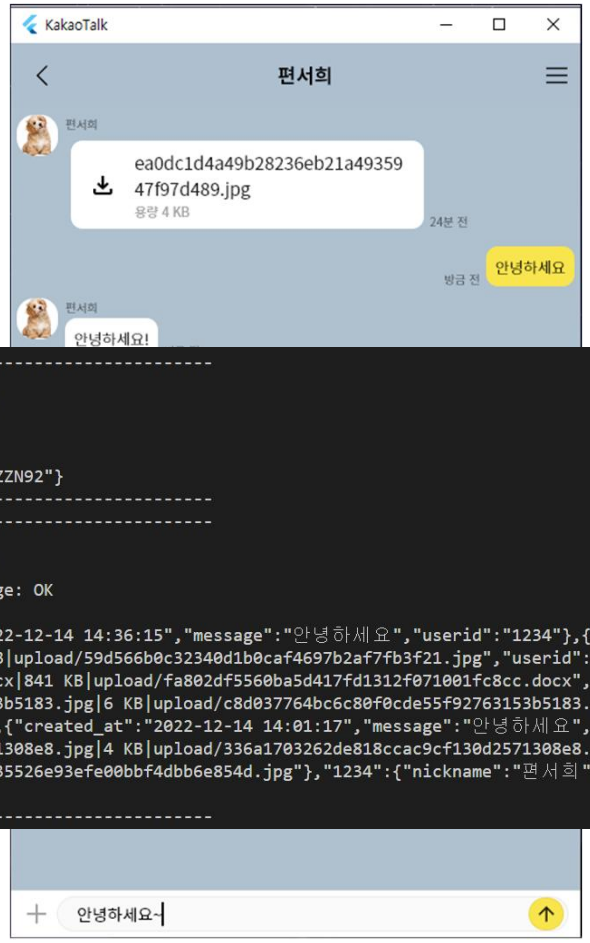

```
flutter: {시간대: 낮, 오늘온도: -5, 날씨: 화창, 강수형태: ,
풍속: 바람이 약합니다., 하늘형태: 구름이 있고 , 강수확률: 20,
습도: 30, 시간: 1400, 이미지: d_d_3.jpg}
```

HTTP communication within Flutter receives data from the public data API.

13. Change profile background API



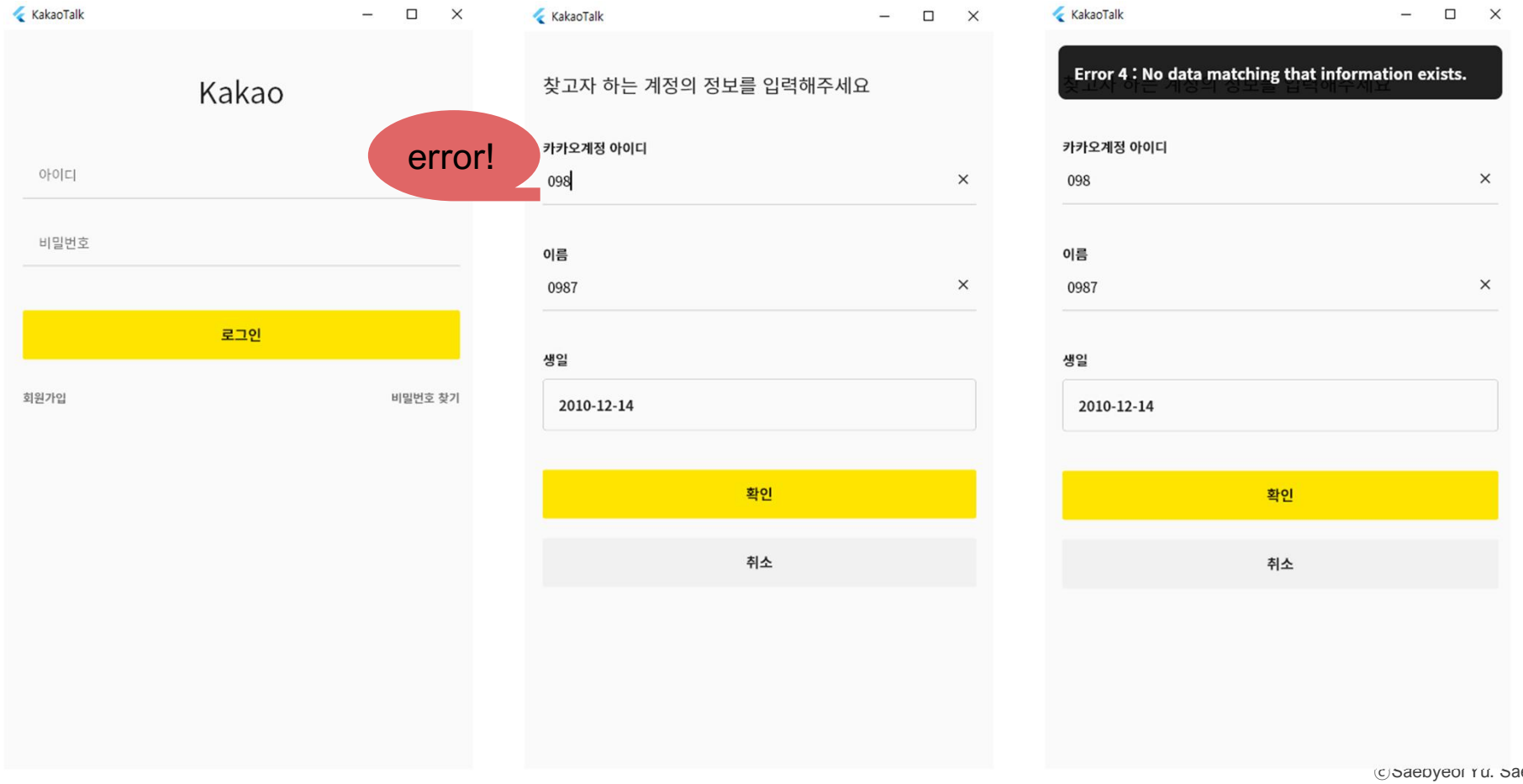
14. Live chat API



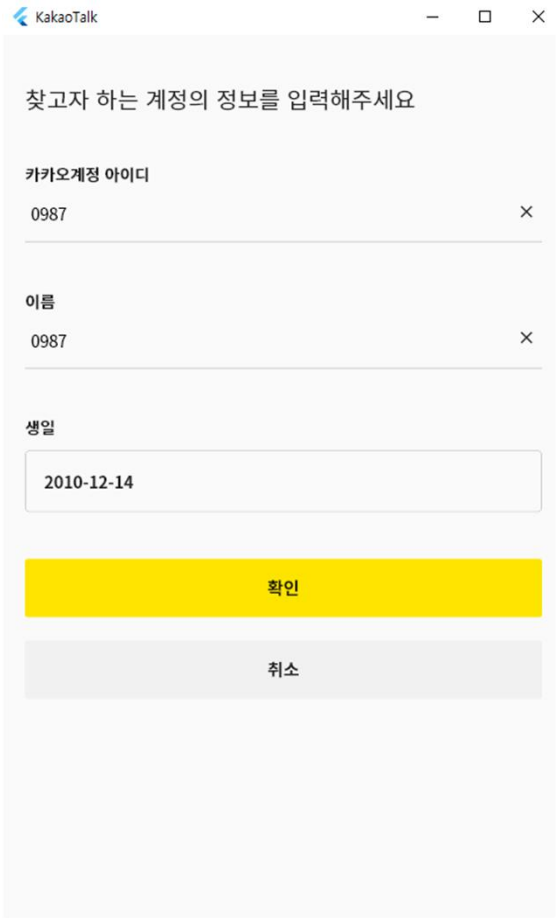

```
[TCP Receive]
IP:/192.168.0.1 Port#:14640
method: POST
route: sendChat
{"myId":"q","message":"안녕하세요","roomId":"MULGBZZN92"}
------------------------------------------------
------------------------------------------------
[TCP Send]
IP:/192.168.0.1 Port#:14640
statusCode: 200 statusMessage: OK
data:
null
```

```
------------------------------------------------
[TCP Receive]
IP:/192.168.0.1 Port#:14592
method: GET
route: receivePostChat
{"myId":"q","roomId":"MULGBZZN92"}
------------------------------------------------
------------------------------------------------
[TCP Send]
IP:/192.168.0.1 Port#:14592
statusCode: 200 statusMessage: OK
data:
{"datas":[{"created_at":"2022-12-14 14:36:15","message":"안녕하세요","userid":"1234"},{"created_at":"2022-12-14 14:23:30","message":"@a(d|59d566b0c32340d1b0
caf4697b2af7fb3f21.jpg|80 KB|upload/59d566b0c32340d1b0caf4697b2af7fb3f21.jpg","userid":"q"},{"created_at":"2022-12-14 14:23:11","message":"@a(d|fa802df5560b
a5d417fd1312f071001fc8cc.docx|841 KB|upload/fa802df5560ba5d417fd1312f071001fc8cc.docx","userid":"q"},{"created_at":"2022-12-14 14:23:01","message":"@a(d|c8d
037764bc6c80f0cde55f92763153b5183.jpg|6 KB|upload/c8d037764bc6c80f0cde55f92763153b5183.jpg","userid":"q"},{"created_at":"2022-12-14 14:01:25","message":"안
녕하세요!","userid":"1234"},{"created_at":"2022-12-14 14:01:17","message":"안녕하세요","userid":"q"},{"created_at":"2022-12-14 12:42:51","message":"@a(d|336
a1703262de818ccac9cf130d2571308e8.jpg|4 KB|upload/336a1703262de818ccac9cf130d2571308e8.jpg","userid":"1234"}],"users":{"q":{"nickname":"정민규","profile_ima
ge_path":"upload/711103b31135526e93efe00bbf4dbb6e854d.jpg"},"1234":{"nickname":"편서희","profile_image_path":"upload/ab11af4403352afeca3a137913110aca0a67.jp
g"}}}
------------------------------------------------
```

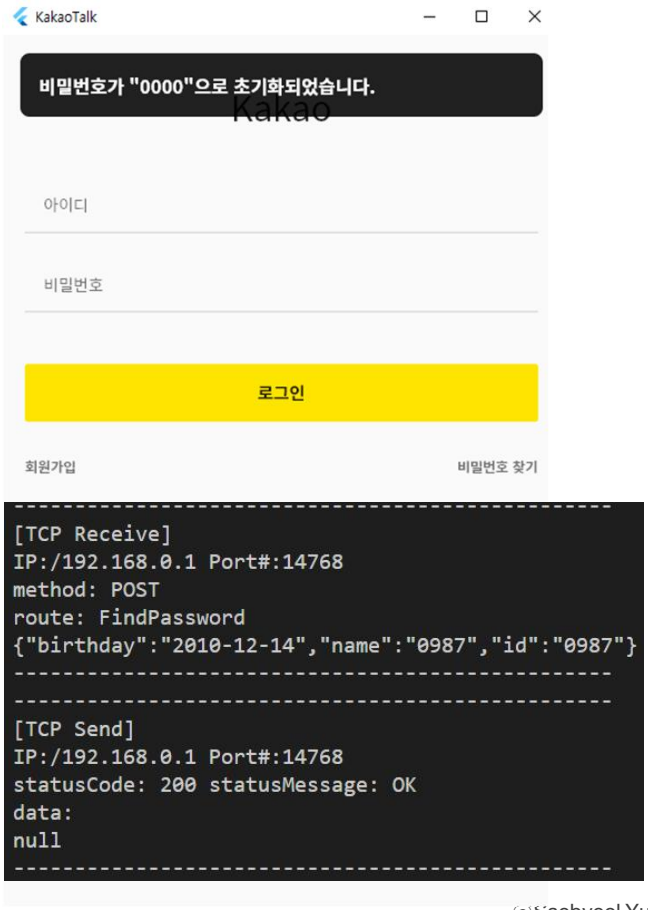
15. Change Password

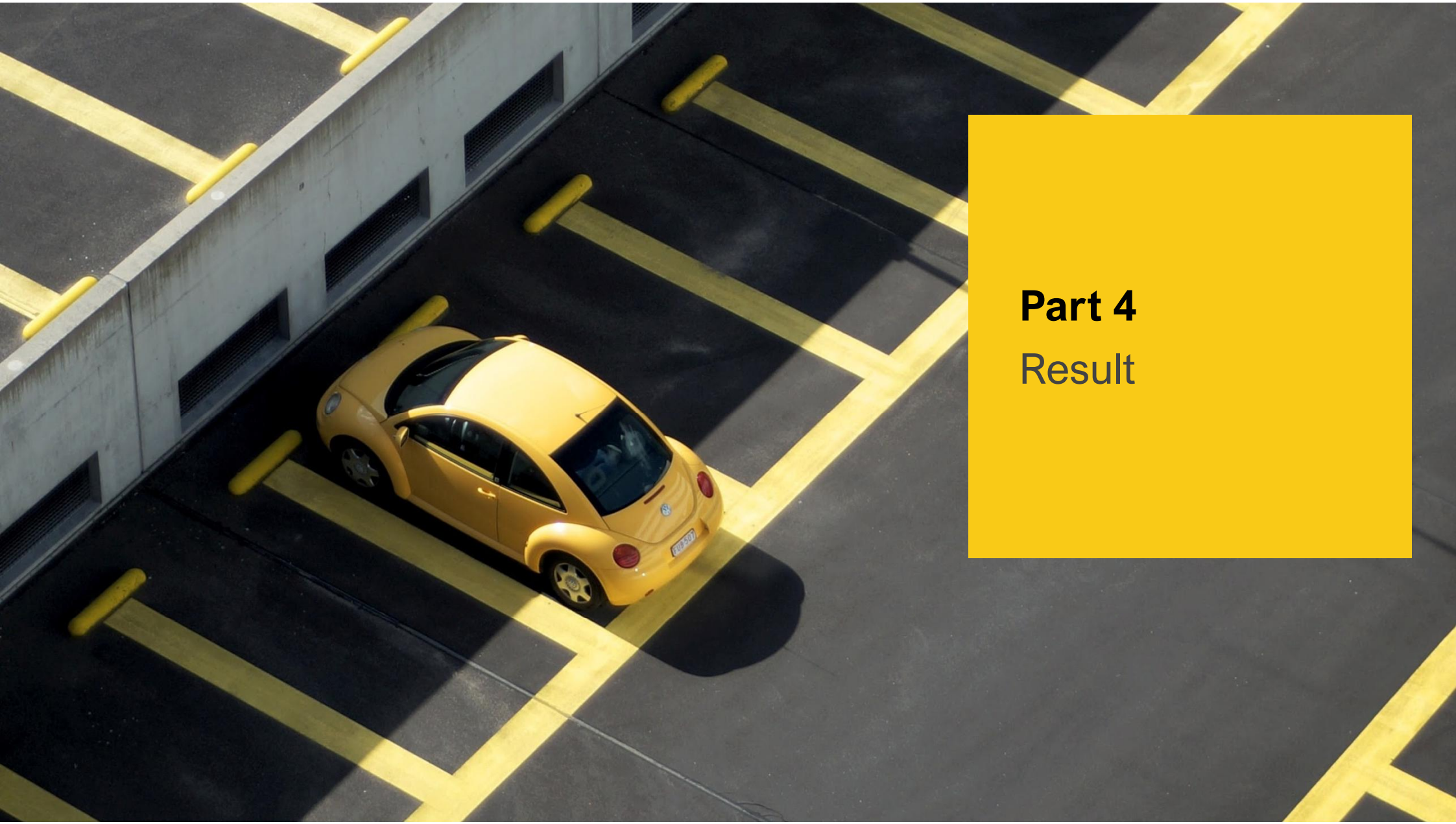


15. Change Password



If right information



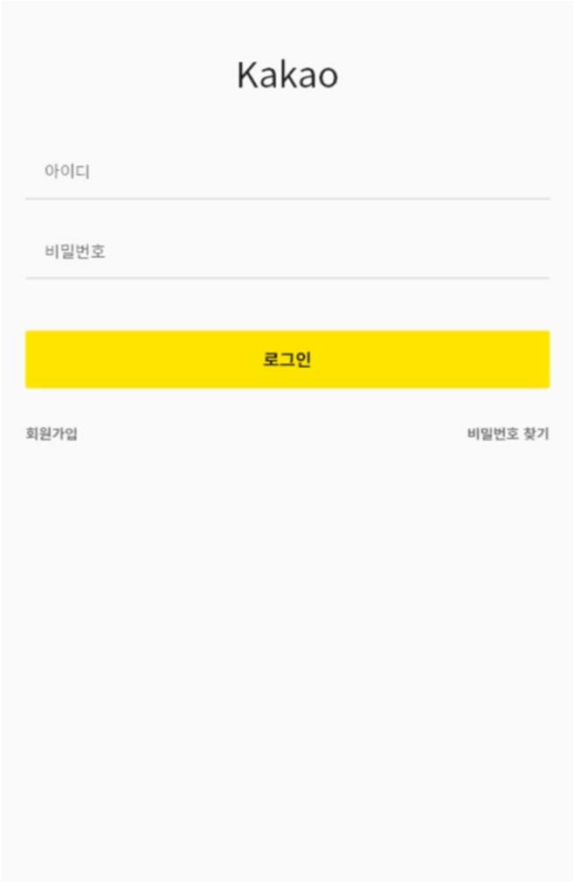


Part 4

Result

Part 04

Demo video



Multi-threaded

```
private static class ReceiveUDPThread implements Runnable {
    @Override
    public void run() {
        try {
            DatagramSocket ds = new DatagramSocket(port: 9998);
            while (true) {
                System.out.println(x: "UDP Waiting for a packet reception..");
                Request request = UDP.receive(ds);
                pool.execute(new RequestThread(request, new Network(ds, request.method)));
            }
        } catch (Exception e) {
            // TODO Auto-generated catch block
            e.printStackTrace();
        }
    }
}
```

Multi-threaded

```
private static class ReceiveTCPThread implements Runnable {
    @Override
    public void run() {
        Socket socket = null;
        try {
            ServerSocket listener = new ServerSocket(port: 9997);
            System.out.println(x: "TCP Waiting for a packet reception..");
            while (true) {
                socket = listener.accept();
                Request request = TCP.receive(socket);
                if (request.method.equalsIgnoreCase(anotherString: "CONNECT"))
                    pool.execute(new TcpThread(request, new Network(socket, request.method)));
                else
                    pool.execute(new RequestThread(request, new Network(socket, request.method)));
            }
        } catch (Exception e) {
            if (socket != null)
                try {
                    socket.close();
                } catch (IOException e1) {
                    // TODO Auto-generated catch block
                    e1.printStackTrace();
                }
            // TODO Auto-generated catch block
            e.printStackTrace();
        }
    }
}
```

Multi-threaded

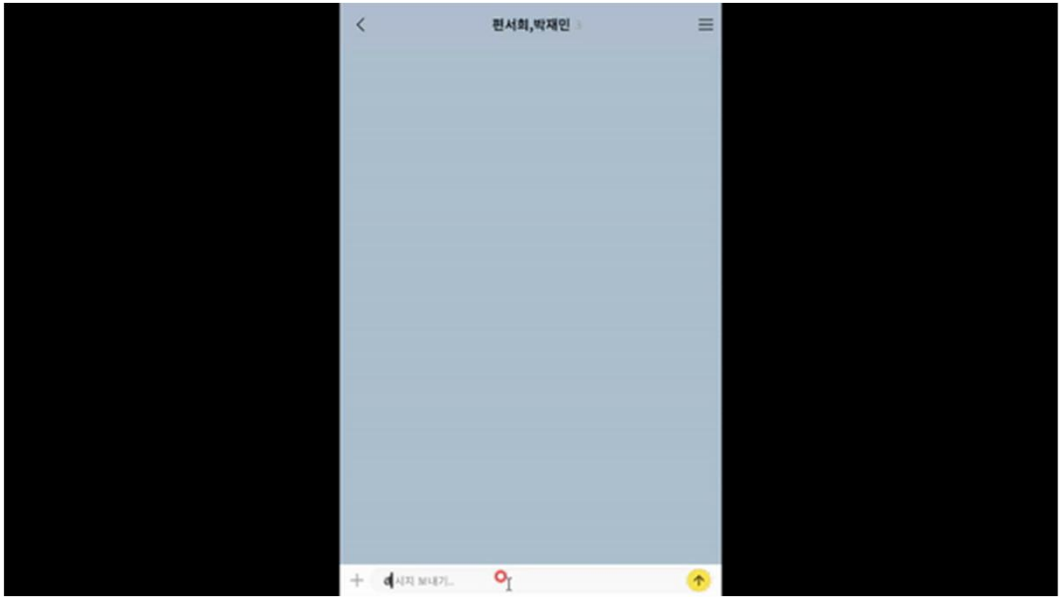
```
Run | Debug
public static void main(String[] args) throws Exception {
    String jdbc_url = "jdbc:mysql://43.200.206.18:3306/networkDB";
    // String jdbc_url = "jdbc:mysql://127.0.0.1:3306/networkDB";
    con = DriverManager.getConnection(jdbc_url, user: "root", password: "gachon");
    updatestmt = con.createStatement();
    pool = Executors.newFixedThreadPool(nThreads: 40);
    pool.execute(new ReceiveUDPThread());
    pool.execute(new ReceiveTCPThread());
}
```

Multi-thread allows for fast chatting

Verify server connectivity

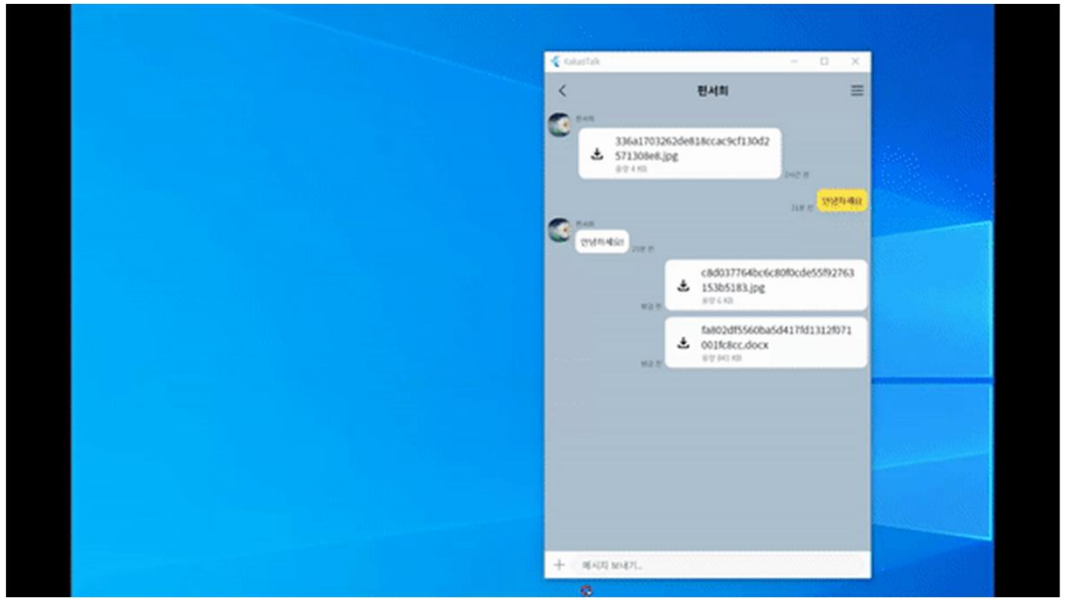
Check if the connection with the server is okay. If you can't connect to the server, you can't escape the Splash Page indefinitely.

Multiple Users in a Room



BroadCast and MultiThread allow several people to continue conversations at a high speed in one room at the same time.

File Transfer



You can upload files using node.js Upload Server and receive files through a browser using the URL of the uploaded file.

Open Source

- https://cloud.google.com/spanner/docs/use-oss-jdbc?hl=ko
- https://pub.dev/packages/get/versions
- https://pub.dev/packages/udp/score
- https://pub.dev/packages/cached_network_image
- https://pub.dev/packages/dio
- https://pub.dev/packages/http
- https://pub.dev/packages/intl/versions/0.17.0-nullsafety.2/install
- https://pub.dev/packages/crypto
- https://pub.dev/packages/file_picker
- https://pub.dev/packages/url_launcher


Thank you for listening