Project Overview:

The Messenger Application is a secure communication platform allowing users to register, log in, and exchange messages or files with other registered users. The application employs Angular on the front end, backed by Spring Boot and Spring Security for server-side functionalities. The database of choice is MySQL, **where encrypted messages and files are securely stored.**

Technologies Used:

Frontend:

- Angular CLI: 16.1.6
- Node: 18.17.0
- Package Manager: npm 9.6.7
- Operating System: Windows 32-bit

Backend:

- Spring Boot: 3.2.2
- Spring Security: 3.0

Database:

- MySQL

Functionality:

User Authentication and Authorization:

The application provides a secure authentication process, allowing users to sign up and log in. Spring Security, integrated with JWT (JSON Web Token), ensures the security of all APIs. JWT tokens are generated upon successful login and must be included in subsequent API requests for access. This mechanism ensures that only authenticated users can utilize the various features of the application.

Components and APIs:

1. **Signup Component:**
    - Allows users to register by providing necessary details.
    - Validates mandatory fields and ensures unique usernames.
2. **Login Component:**
    - Provides a secure login mechanism for registered users.
    - Generates JWT tokens for authenticated users.

3. **Home Component:**
    - Acts as the main page after login, providing an overview of available features.
4. **Send Message Component:**
    - Allows users to securely send messages or files to other registered users.
    - Encrypts messages before storing them in the cloud.
5. **Inbox and Outbox Components:**
    - Display received and sent messages respectively.

JWT Token Handling:

- JWT tokens are crucial for accessing protected APIs.
- Tokens are sent from the backend to the frontend upon login.
- Token validation is performed on the server side for secure API access.
- If a token expires, users are redirected to the login page.

Security Measures:

- Spring Security secures all APIs except for login and register APIs.
- Passwords are encrypted before storage in MySQL for enhanced security.

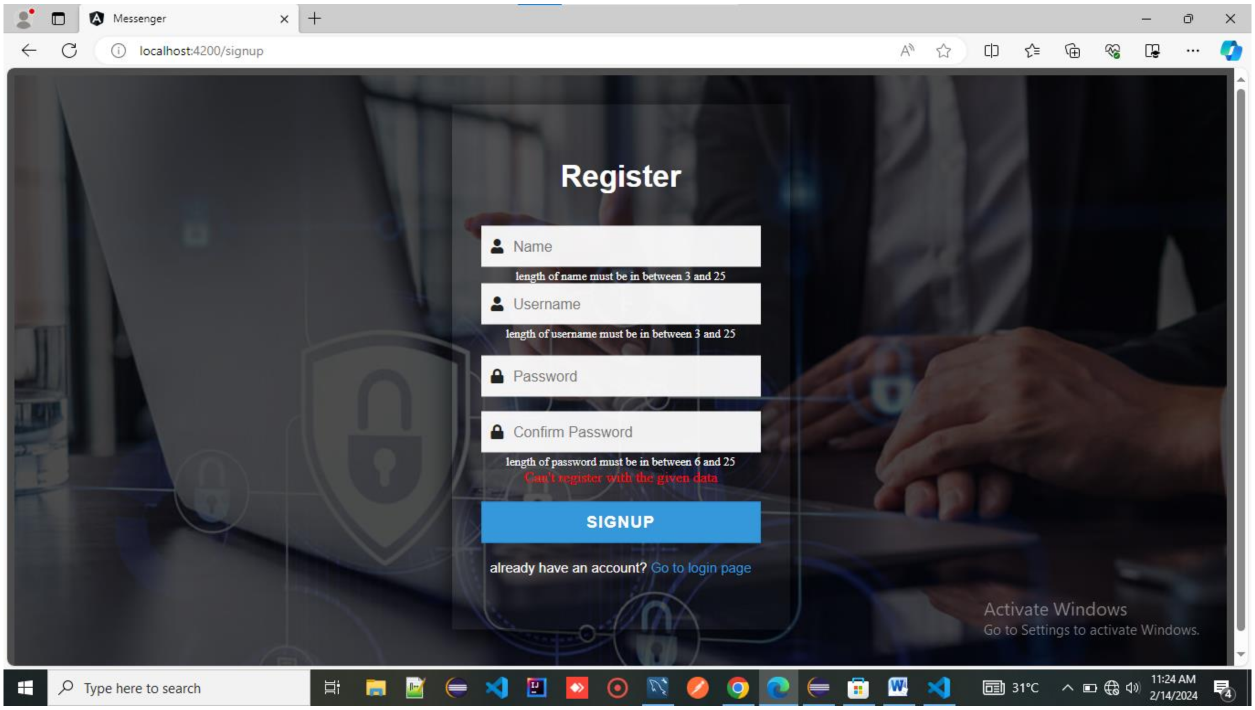
Workflow:

1. **User Registration:**
    - Users sign up with mandatory details.
    - Unique usernames are enforced.
    - Passwords are securely encrypted before storage.
2. **User Authentication:**
    - Secure login mechanism.
    - JWT tokens generated for authenticated users.
3. **Message Exchange:**
    - Users can send and receive encrypted messages/files.
    - Messages are securely stored in the cloud.
4. **Token Validation:**
    - JWT tokens ensure secure access to protected APIs.
    - Token validation is performed server-side.
5. **Security Navigation:**
    - Expired tokens redirect users to the login page for reauthentication.

This comprehensive Messenger Application provides a secure and user-friendly environment for communication, ensuring the confidentiality and integrity of user data. The integration of Angular, Spring Boot, and Spring Security creates a robust platform with a focus on user privacy and data security.

Project flow:

- Signup page when there exists validation errors.



localhost:4200/signup

Register

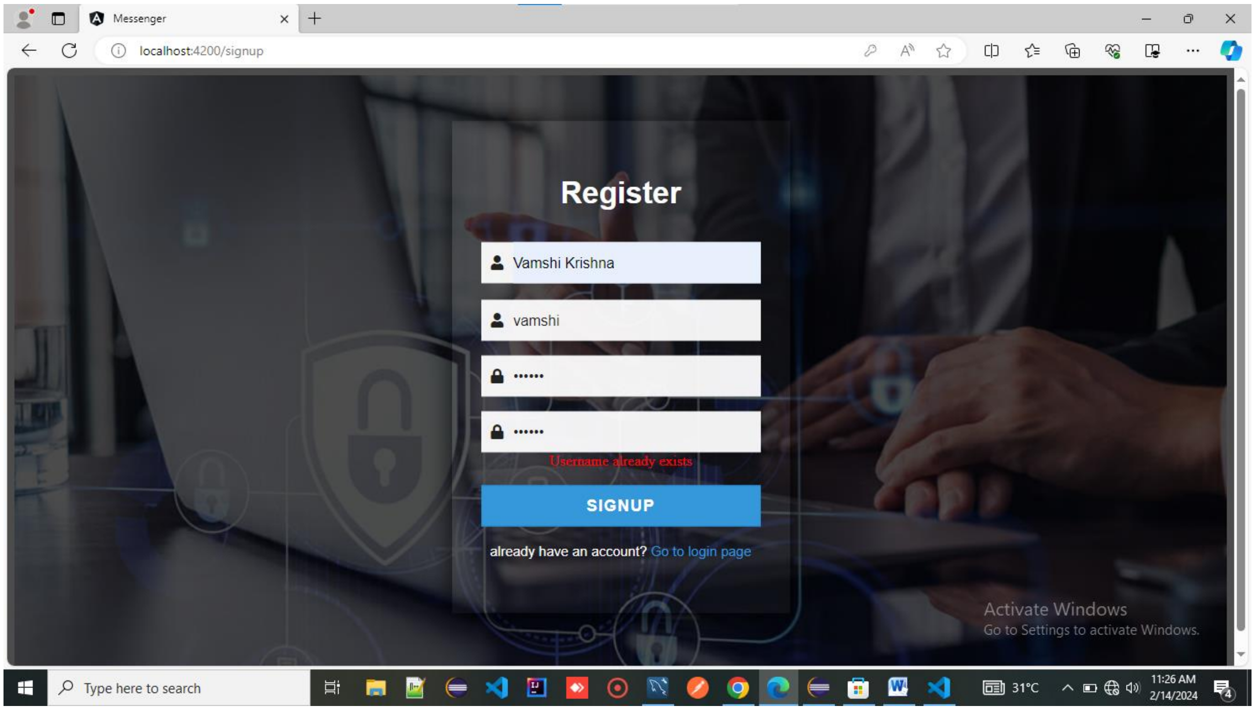
length of name must be in between 3 and 25

length of username must be in between 3 and 25

length of password must be in between 6 and 25

Can't register with the given data

- Signup page when user already exists.



localhost:4200/signup

Register

Vamshi Krishna

vamshi

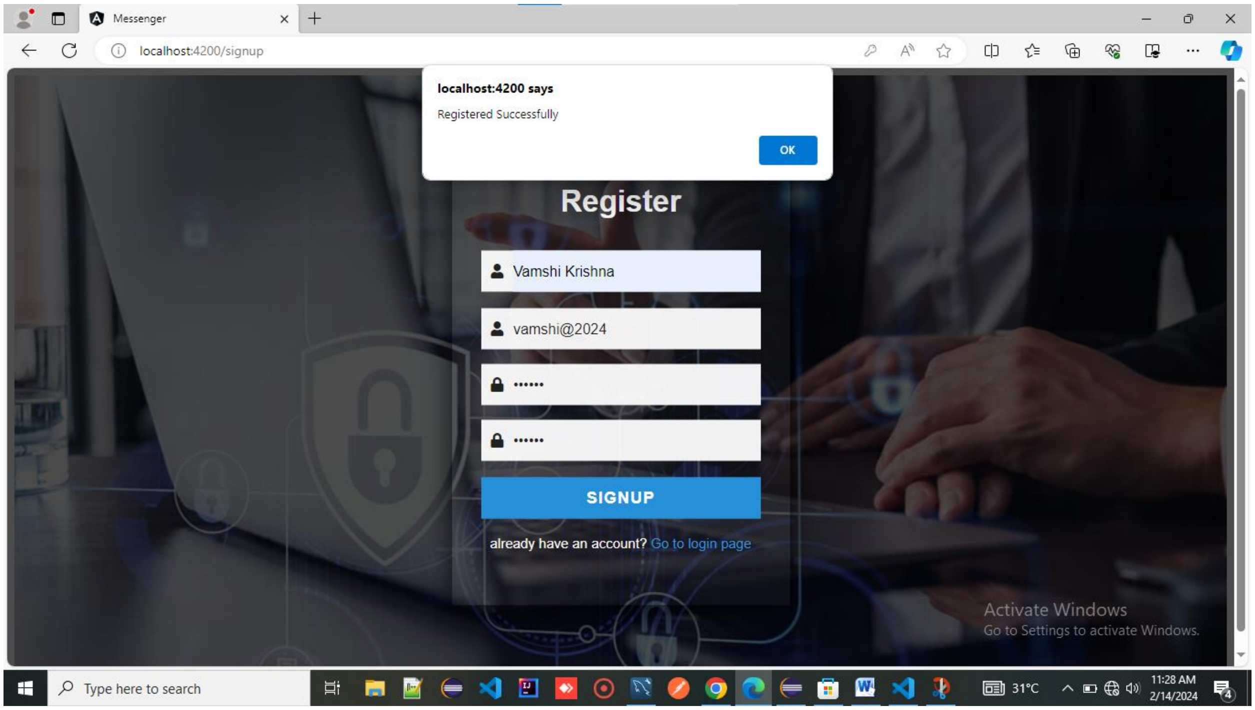
••••••

••••••

Username already exists

Messenger
SIGNUP
already have an account? Go to login page
Activate Windows
Go to Settings to activate Windows.
Type here to search
31°C
11:26 AM
2/14/2024

- Signup page when user registered successfully and when user click “OK” it redirects user to the login page.



localhost:4200/signup

localhost:4200 says

Registered Successfully

OK

Register

Vamshi Krishna

vamshi@2024

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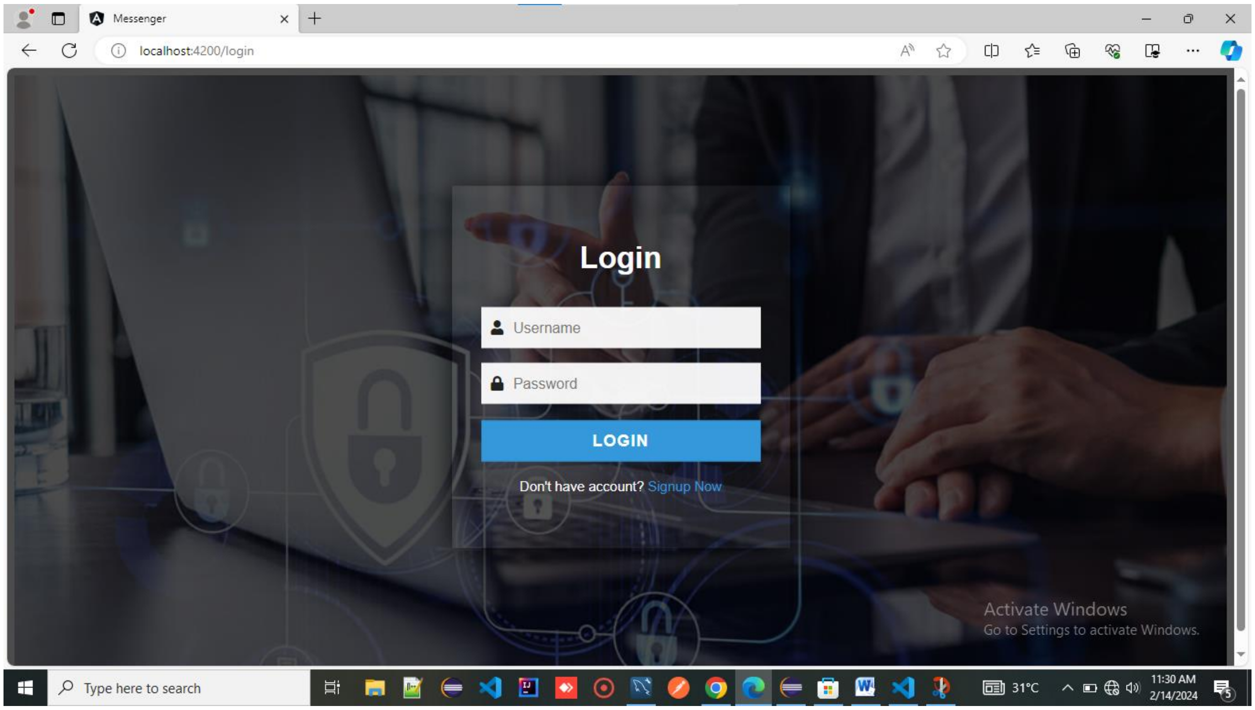
••••••

SIGNUP

already have an account? Go to login page

- Login page.



localhost:4200/login

Login

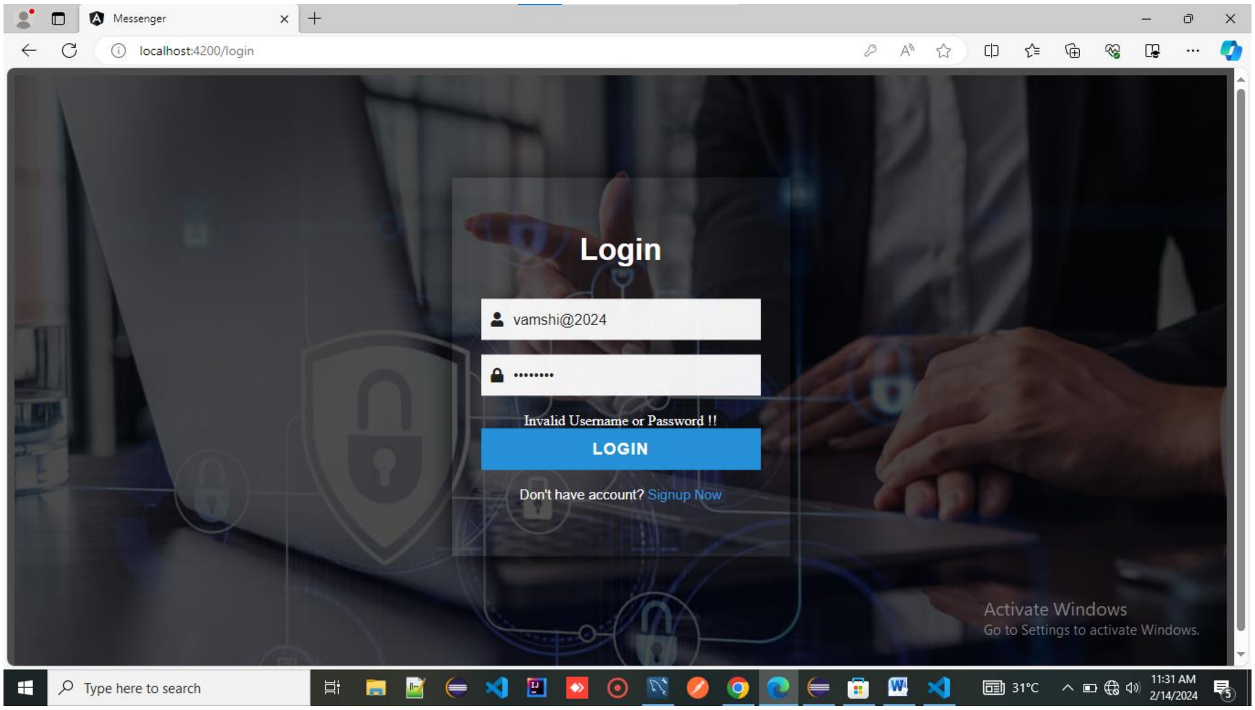
Username

Password

LOGIN

Don't have account? Signup Now

- Login page when user enters invalid credentials.



localhost:4200/login

Login

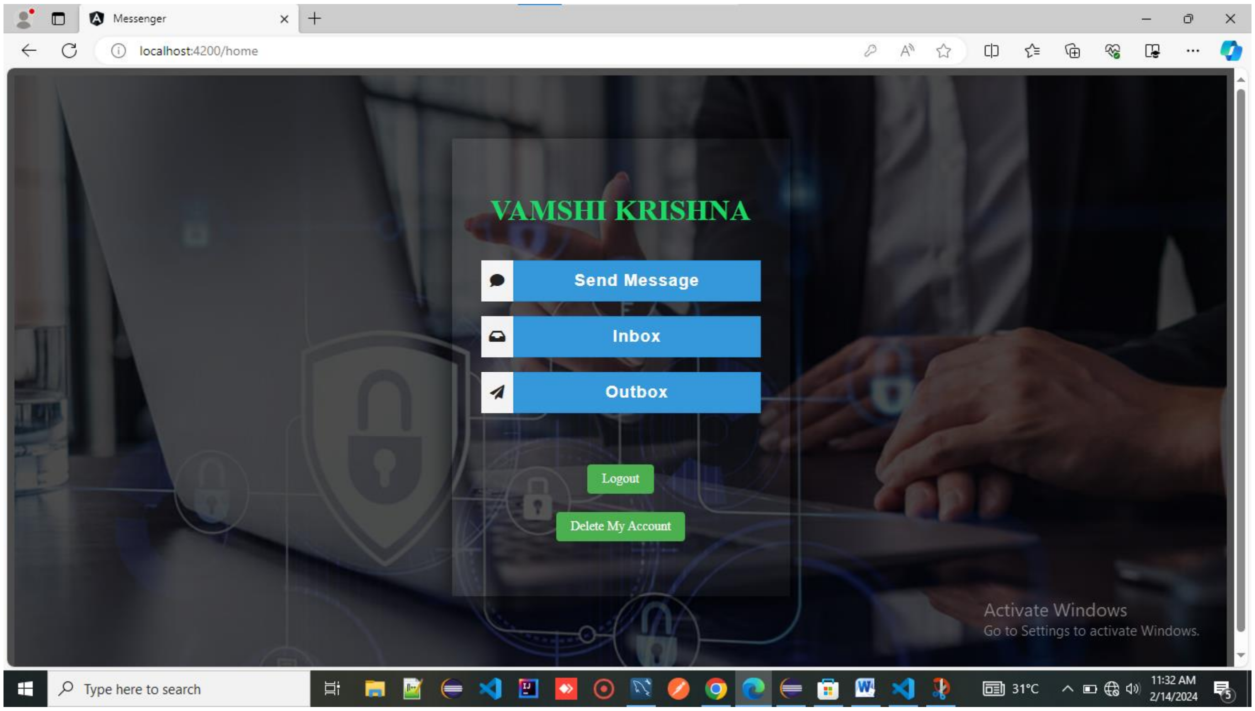
vamshi@2024

••••••••

Invalid Username or Password !!

Don't have account? Signup Now

- When user enters valid credentials it redirects to Home Page.



localhost:4200/home

VAMSHI KRISHNA

- When user click on “Send Message” button it redirects to below page and when user sends message it gives popup success message.
- User need to select the recipient or else it gives error message says “please select a recipient”.
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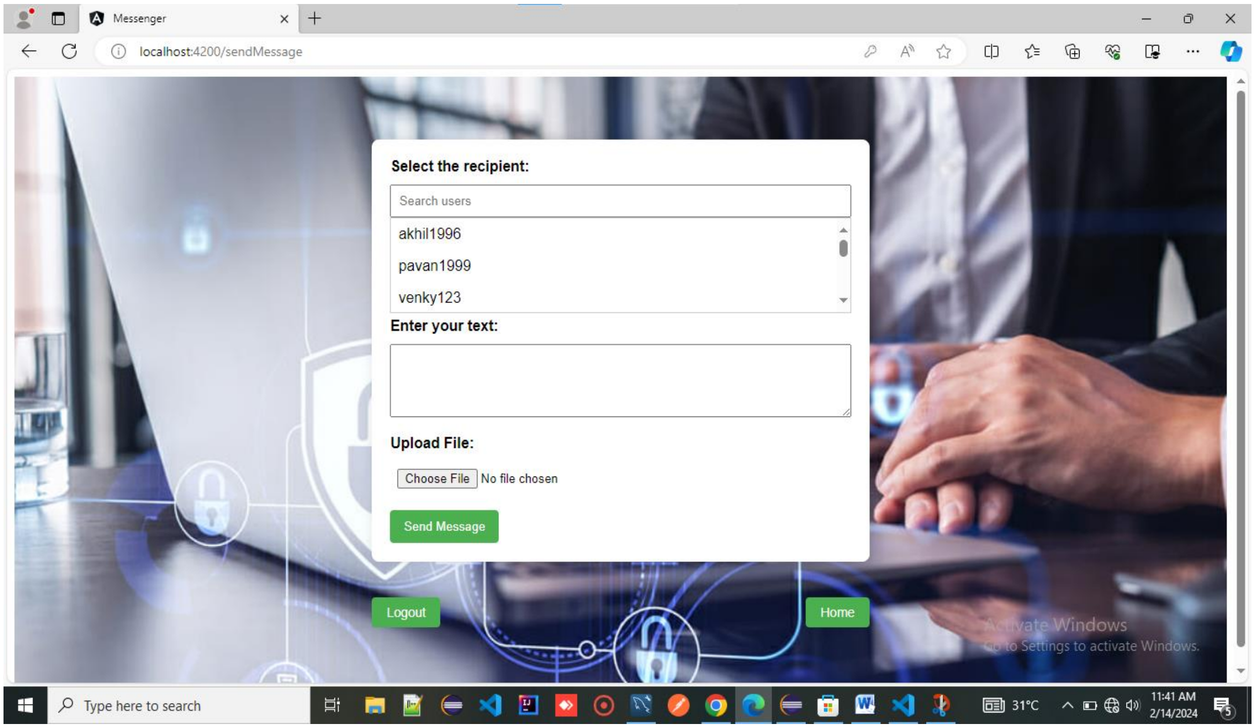
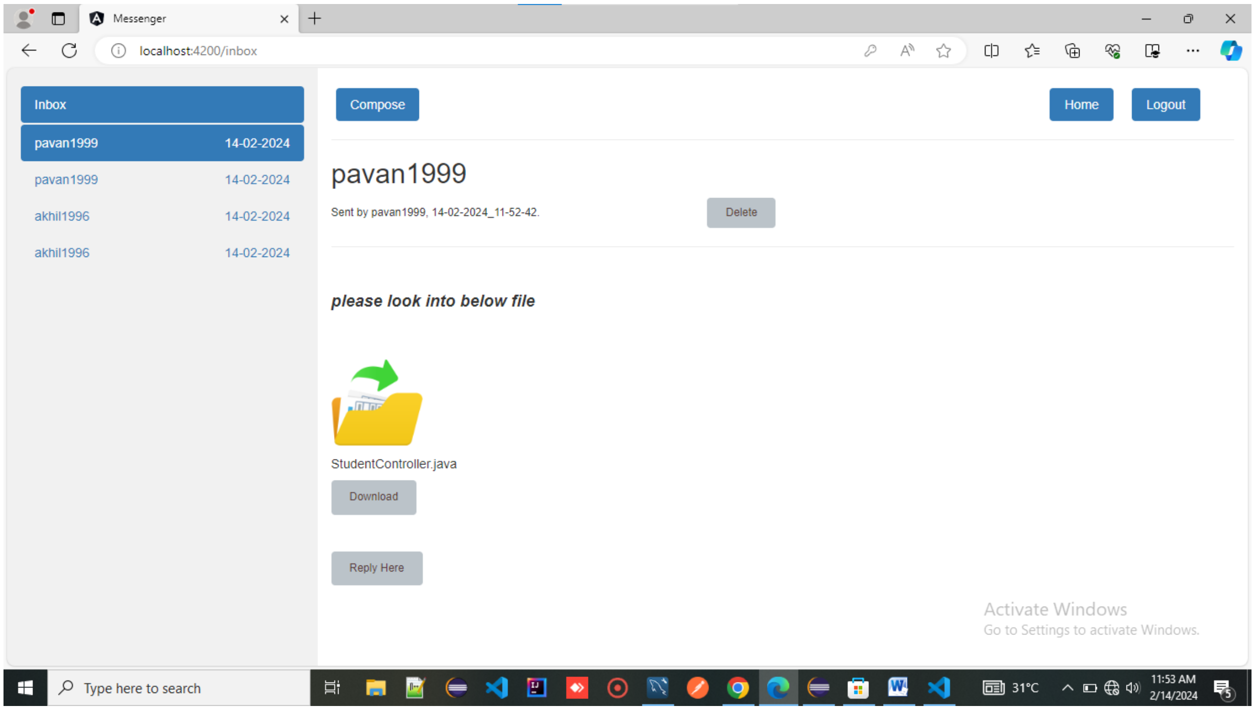


- Inbox page Where it contains all received messages.



pavan1999	14-02-2024
pavan1999	14-02-2024
akhil1996	14-02-2024
akhil1996	14-02-2024

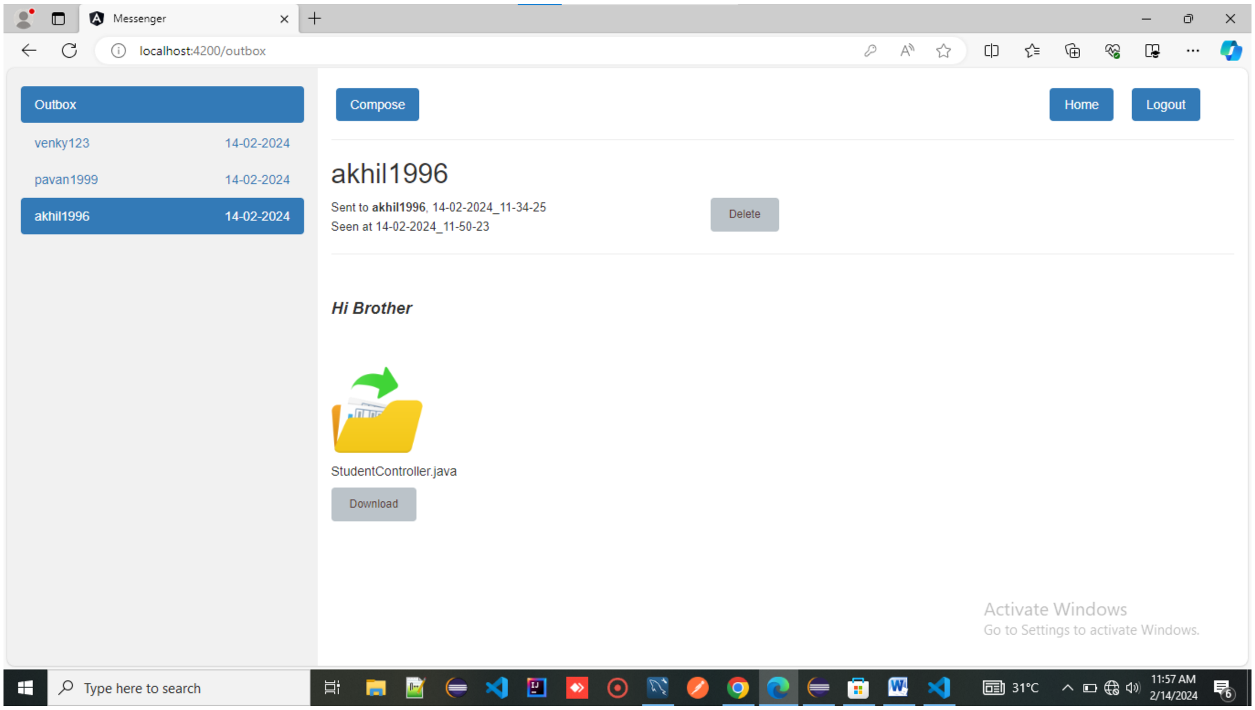
pavan1999

Sent by pavan1999, 14-02-2024_11-52-42.

please look into below file

StudentController.java

- Outbox page where it contains all sent messages.



venky123	14-02-2024
pavan1999	14-02-2024
akhil1996	14-02-2024

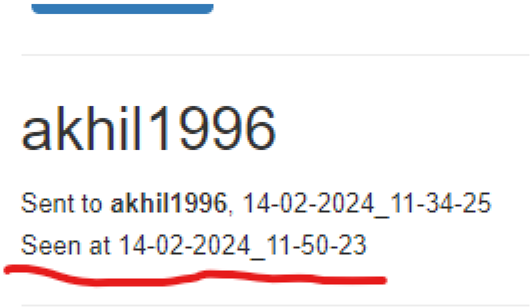
akhil1996

Sent to **akhil1996**, 14-02-2024_11-34-25
Seen at 14-02-2024_11-50-23

Hi Brother

StudentController.java

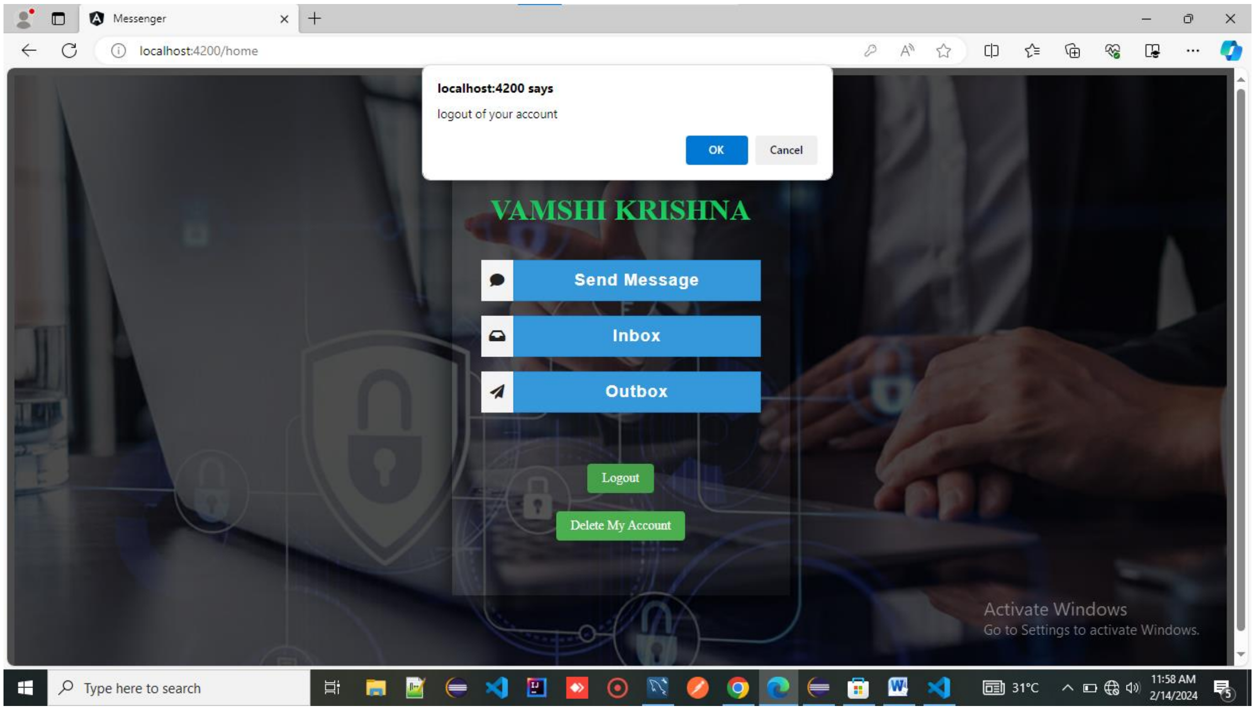
- In Outbox page when receiver seen the message that we sent then a message with time will appear below heading or else it doesn't show that seen message



akhil1996

Sent to **akhil1996**, 14-02-2024_11-34-25
Seen at 14-02-2024_11-50-23

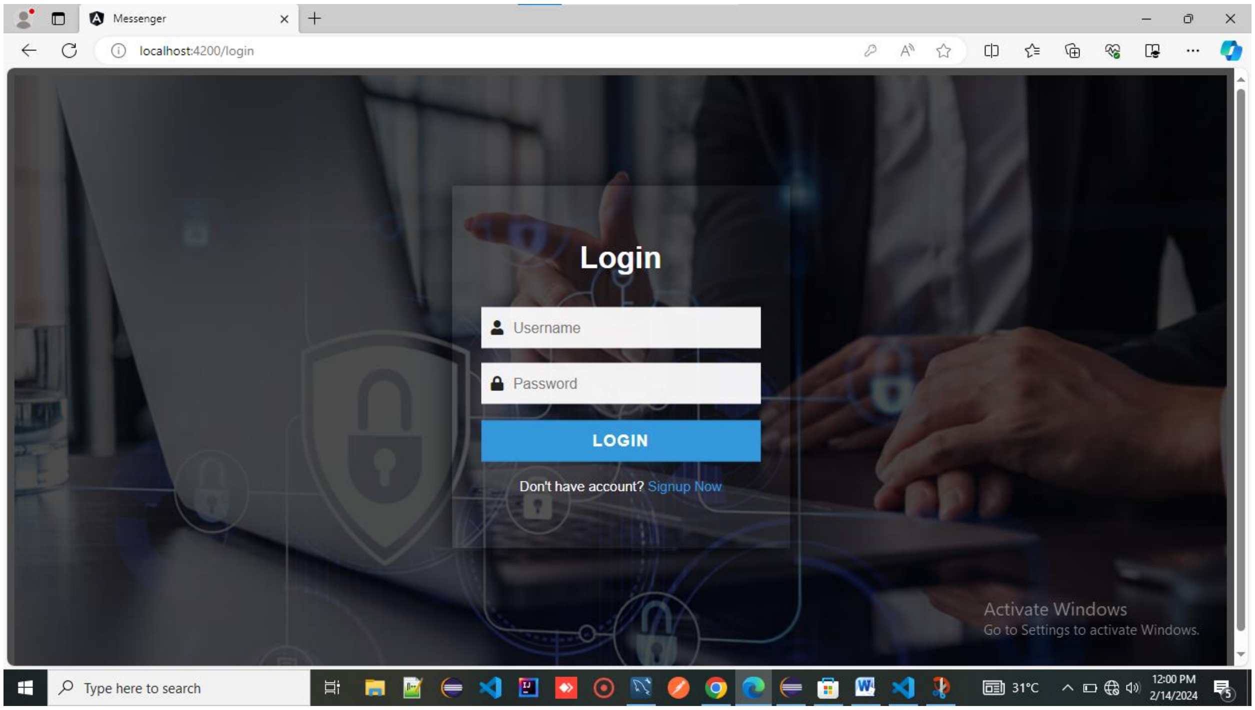
- When user logged out.



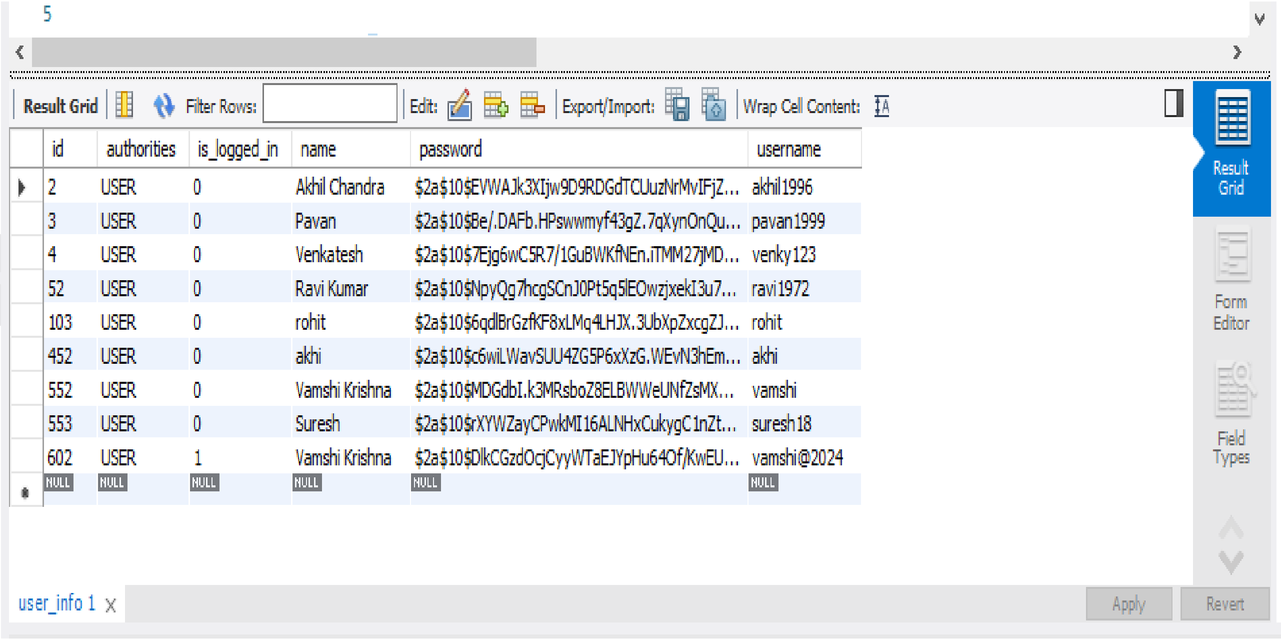
localhost:4200 says

logout of your account

- When user click “ OK “ , it redirects to login page.

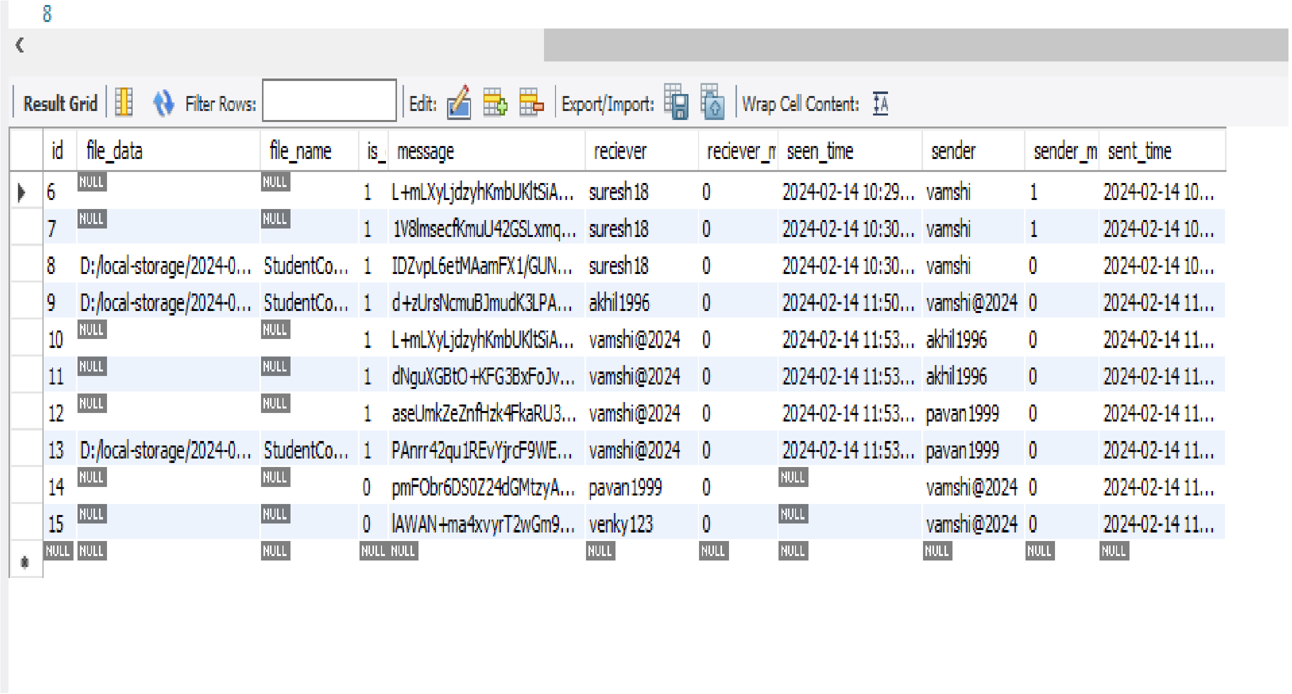


- Below is the **MySql table of user_info** table where all the registered details are stored by encrypting sensitive data like password.



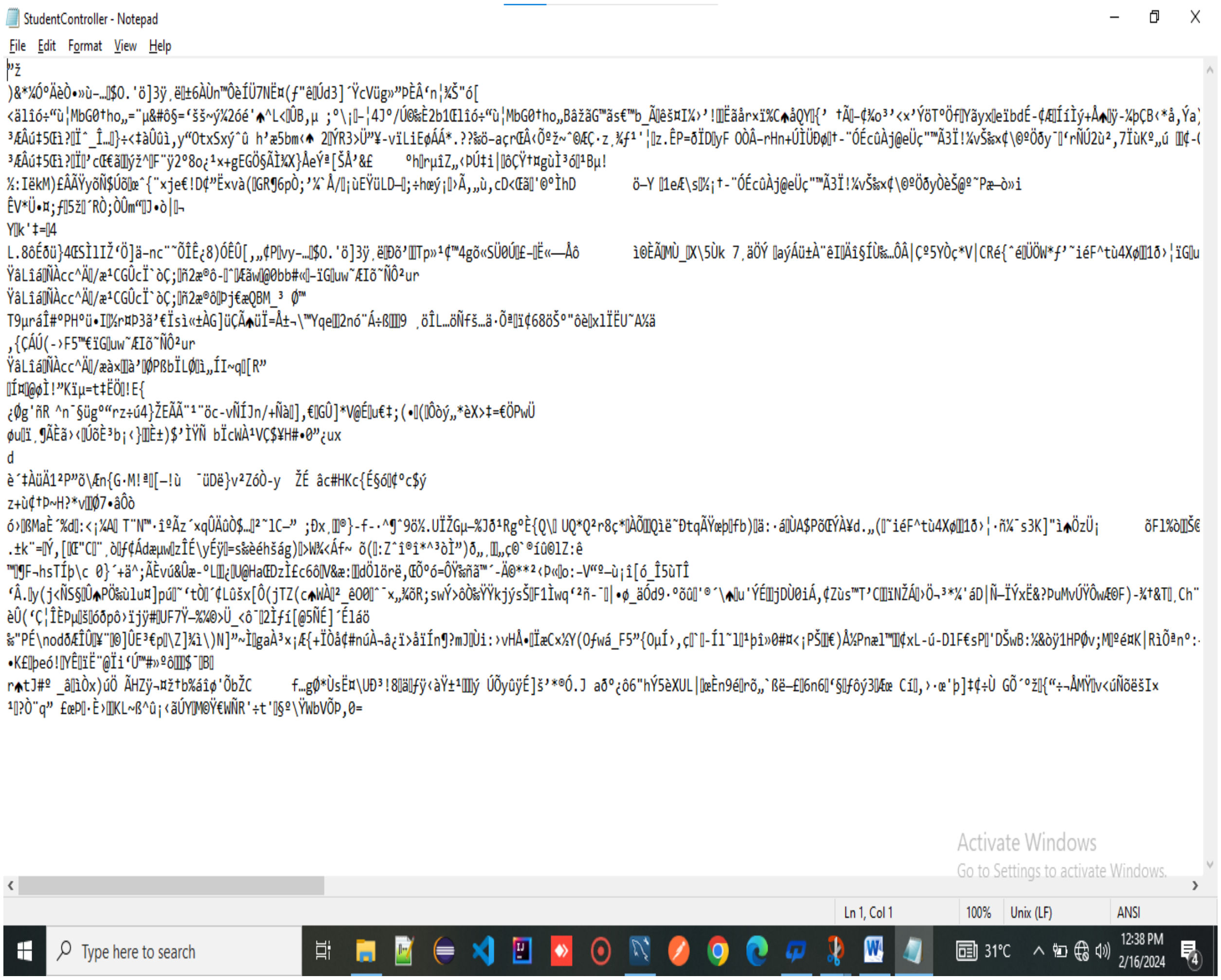
id	authorities	is_logged_in	name	password	username
2	USER	0	Akhil Chandra	$2a$10$EVWAJk3XIjw9D9RDGdTCUuzNrMvIFjZ...	akhil1996
3	USER	0	Pavan	$2a$10$Be/.DAFb.HPswwmyf43gZ.7qXynOnQu...	pavan1999
4	USER	0	Venkatesh	$2a$10$7Ejg6wC5R7/1GuBWKfNEn.iTMM27jMD...	venky123
52	USER	0	Ravi Kumar	$2a$10$NpyQg7hcgSCnJ0Pt5q5lEOwzjxekI3u7...	ravi1972
103	USER	0	rohit	$2a$10$6qdlBrGzfKF8xLMq4LHJX.3UbXpZxcgZJ...	rohit
452	USER	0	akhi	$2a$10$c6wiLWavSUU4ZG5P6xXzG.WEvN3hEm...	akhi
552	USER	0	Vamshi Krishna	$2a$10$MDGdbI.k3MRsboZ8ELBWWeUNfZsMX...	vamshi
553	USER	0	Suresh	$2a$10$rXYWZayCPwkMI16ALNHxCukygC1nZt...	suresh18
602	USER	1	Vamshi Krishna	$2a$10$DlkCGzdOcjCyyWTaEJYpHu64Of/KwEU...	vamshi@2024
NULL	NULL	NULL	NULL	NULL	NULL

- Below is **the MySql table of message_info** table where all the message details are stored (by encrypting message).



id	file_data	file_name	is_	message	reciever	reciever_r	seen_time	sender	sender_m	sent_time
6	NULL	NULL	1	L+mLXyLjdzyhKmbUKltSiA...	suresh18	0	2024-02-14 10:29...	vamshi	1	2024-02-14 10...
7	NULL	NULL	1	1V8lmsecfKmuU42GSLxmq...	suresh18	0	2024-02-14 10:30...	vamshi	1	2024-02-14 10...
8	D:/local-storage/2024-0...	StudentCo...	1	IDZvpL6etMAamFX1/GUN...	suresh18	0	2024-02-14 10:30...	vamshi	0	2024-02-14 10...
9	D:/local-storage/2024-0...	StudentCo...	1	d+zUrsNcmuBJmudK3LPA...	akhil1996	0	2024-02-14 11:50...	vamshi@2024	0	2024-02-14 11...
10	NULL	NULL	1	L+mLXyLjdzyhKmbUKltSiA...	vamshi@2024	0	2024-02-14 11:53...	akhil1996	0	2024-02-14 11...
11	NULL	NULL	1	dNguXGBtO+KFG3BxFoJv...	vamshi@2024	0	2024-02-14 11:53...	akhil1996	0	2024-02-14 11...
12	NULL	NULL	1	aseUmkZeZnfHzk4FkaRU3...	vamshi@2024	0	2024-02-14 11:53...	pavan1999	0	2024-02-14 11...
13	D:/local-storage/2024-0...	StudentCo...	1	PAnrr42qu1REvYjrcF9WE...	vamshi@2024	0	2024-02-14 11:53...	pavan1999	0	2024-02-14 11...
14	NULL	NULL	0	pmFObr6DS0Z24dGMtzyA...	pavan1999	0	NULL	vamshi@2024	0	2024-02-14 11...
15	NULL	NULL	0	lAWAN+ma4xvyrT2wGm9...	venky123	0	NULL	vamshi@2024	0	2024-02-14 11...
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

- Below is encrypted format of a file that my application is storing so that no other non authorized user can able to read my message or file.



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But when the authenticated and authorized user is fetching the messages or files then my application decrypts the already encrypted messages or files and sends it to user to make it readable.