Video Conferencing Application With Speech Transcription

Capstone Project Phase I
Project Number 24-1-D-19

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Introduction

- After COVID-19, remote conference became more and more popular, but until now all the applications don't have the ability to save the transcript of the conference .

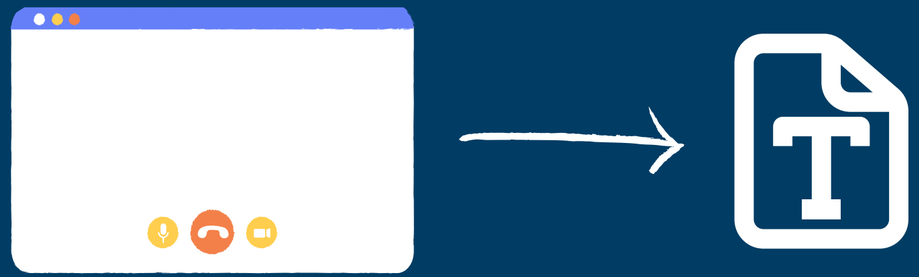
Motivation

- How does speech recognition technology impact communication and accessibility for handicapped and people with hearing impairments?

- Identfying current limitations in current speech recognition systems.

Project Goal

- Developing Video Chat Application, that provides a transcript of the spoken content at the end of the Video Chat session.



Speech Recognition Problems

- Background Noise
- Accents and Dialects
- Multiple Speakers
- Computational Limitations
- Limited Training Data

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Technologies

Various Speech-To-Text Algorithms are used for different needs; some are basic, and some are more advanced.

- **Hidden Markov Models (HMMs)** and **Gaussian Mixture Models (GMMs)**.
- **Recurrent Neural Networks (RNNs)**.
- Transformers.
- Conformers. (we used AssemblyAi api for transcriptiong the audio and stream.io sdk for video chatting)

The Process - Constraints

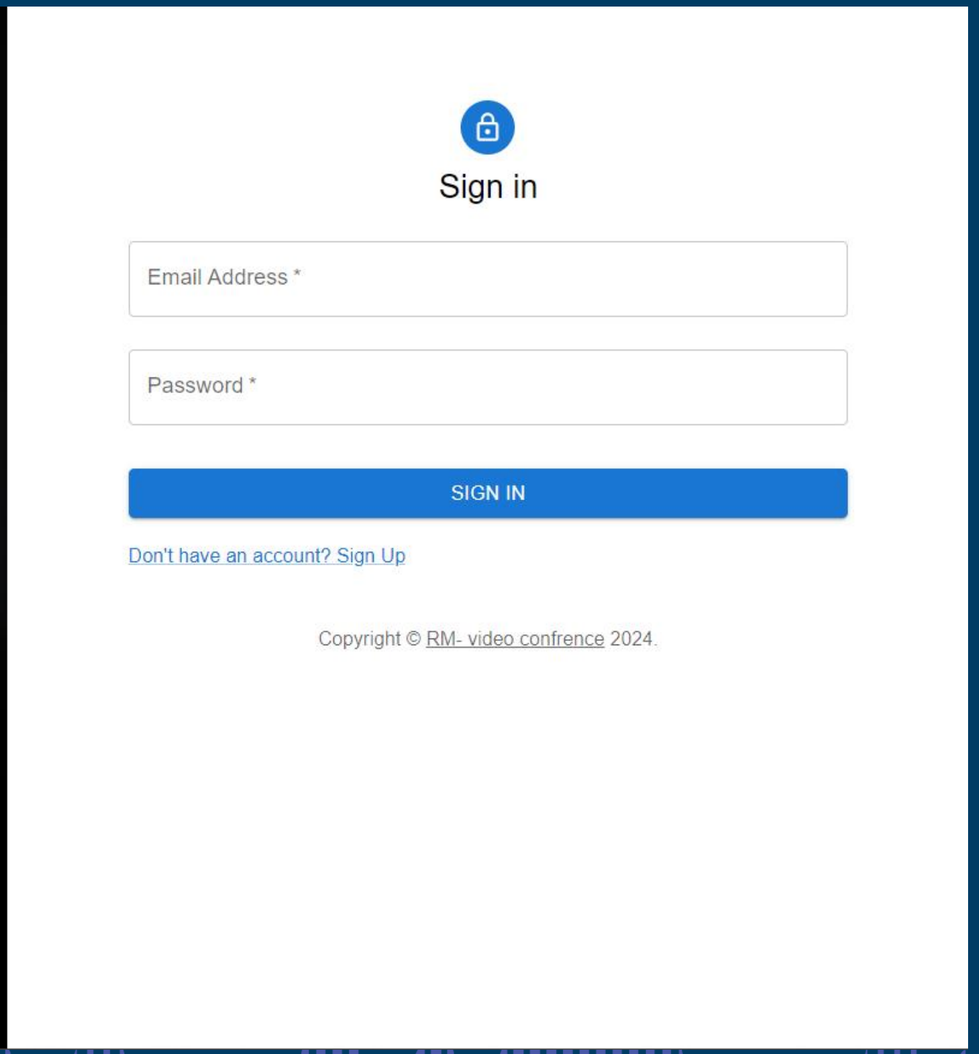
- Computational resources.
- AssemblyAI- Only English!
- Number of participants.

Research

Introducing RM-Video Conference

- RM is designed to be User-friendly and easy to use.
- RM has two main functionalities:
    1. Video-Chat meetings. (Using Stream.io SDK’s)
    2. Transcription.(AssemblyAI -API’s)
- RM has the ability to save a transcripted session so user can use later.

Screens - Login



Screens - signup

Sign Up

Full Name *

Email Address *

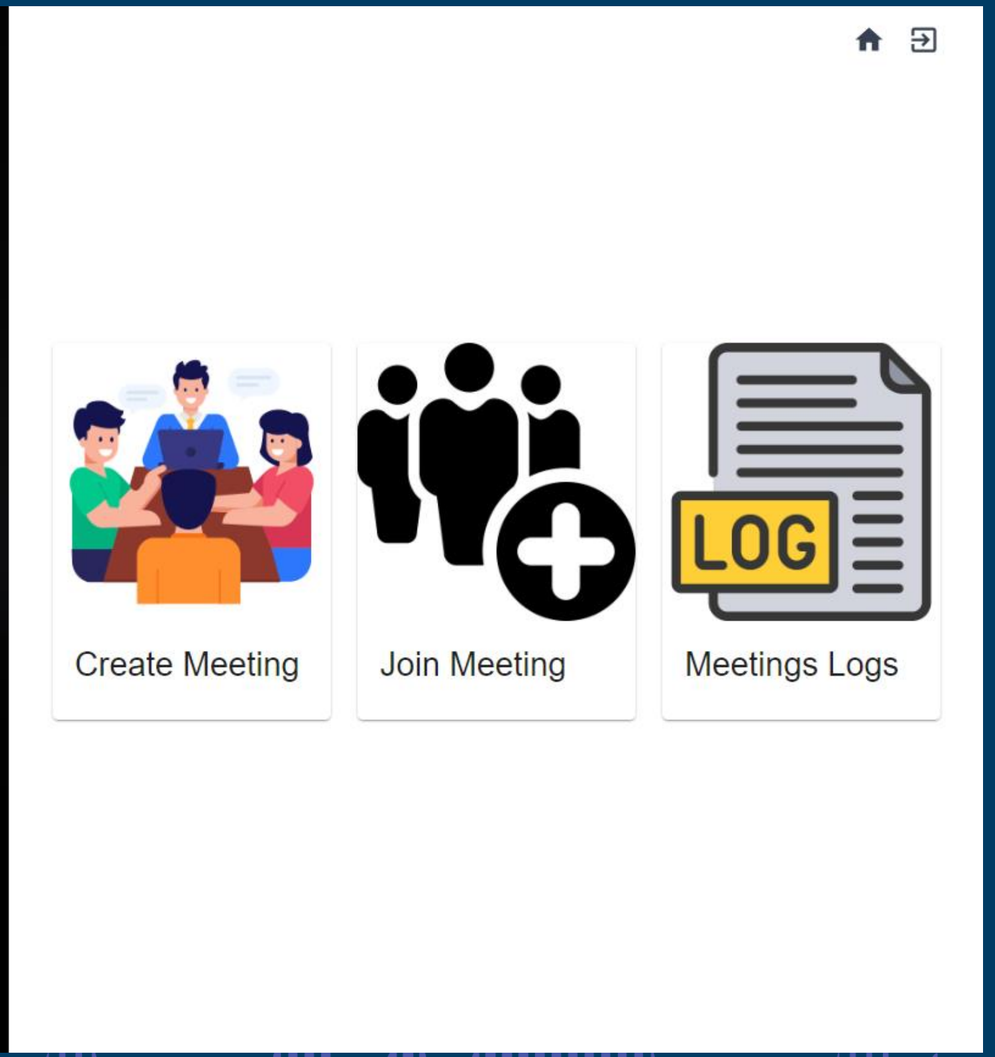
Password *

SIGN UP

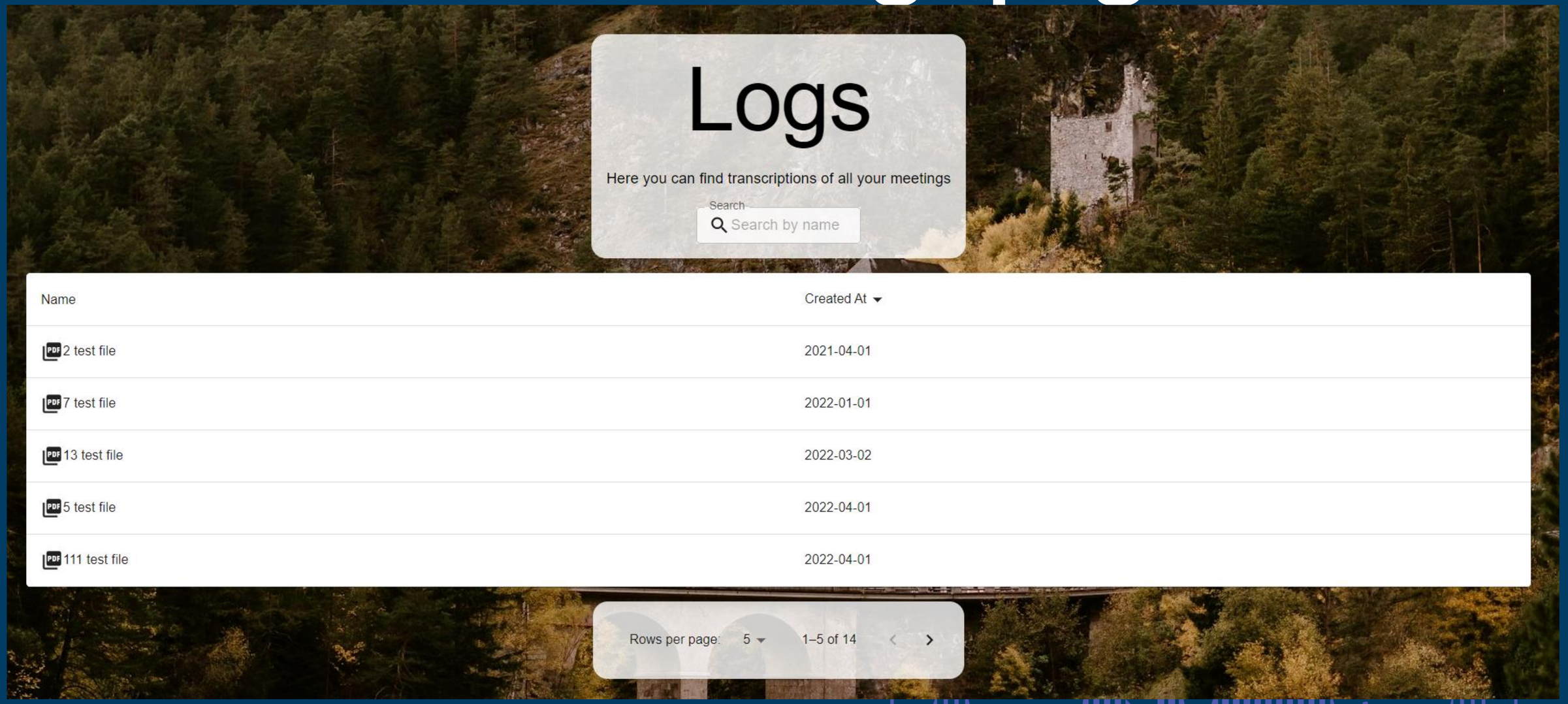
Already have an account? Sign In

Copyright © RM- video confrence 2024.

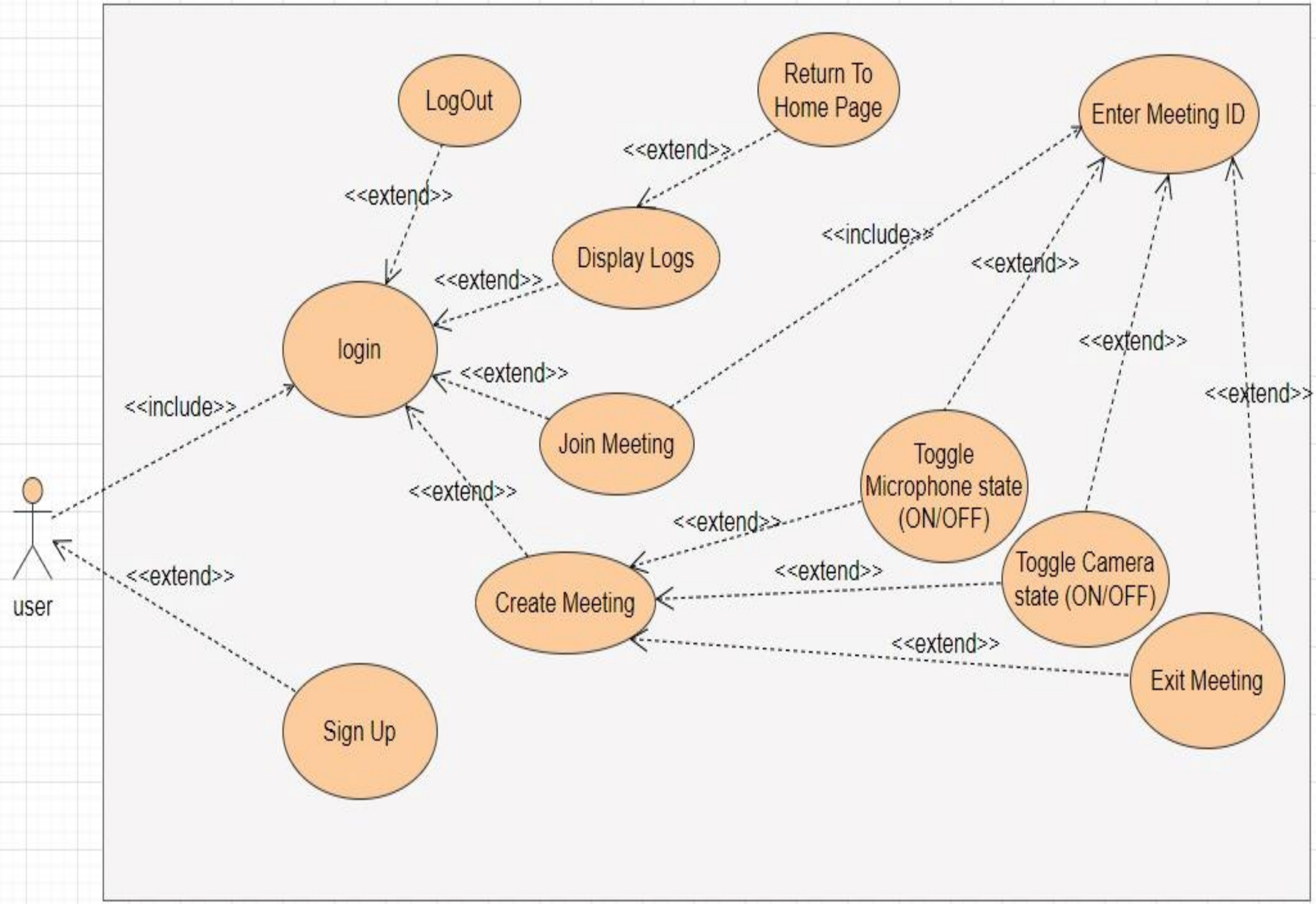
Screens - homepage



Screens – logs page



Use Case


LogOut
Return To Home Page
Enter Meeting ID
<<extend>>
<<extend>>
Display Logs
<<include>>
<<extend>>
<<extend>>
login
<<extend>>
<<extend>>
<<include>>
Join Meeting
<<extend>>
Toggle Microphone state (ON/OFF)
<<extend>>
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<<extend>>
Toggle Camera state (ON/OFF)
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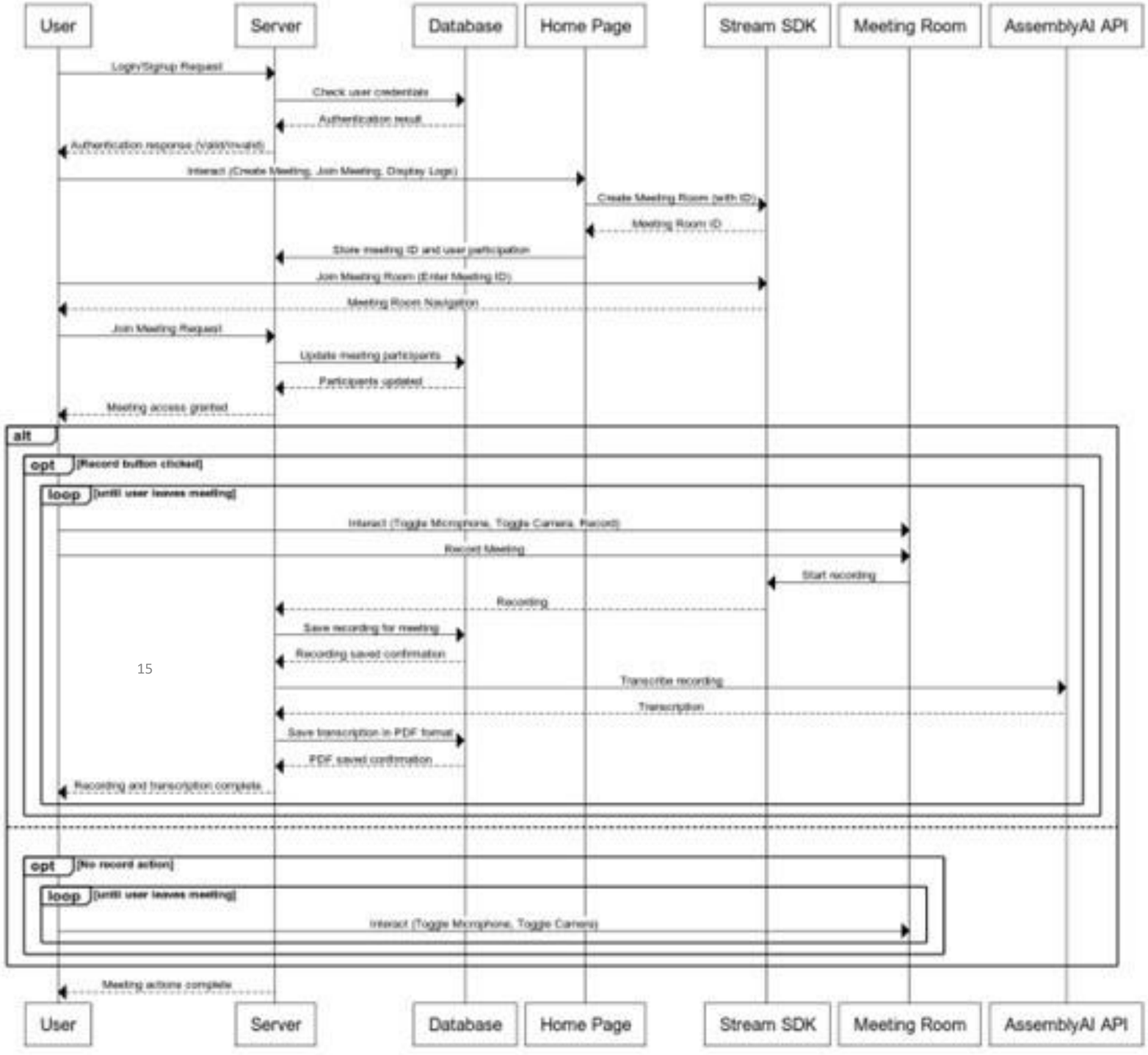
user
<<extend>>
Create Meeting
<<extend>>
Exit Meeting
Sign Up

Sequence Diagram



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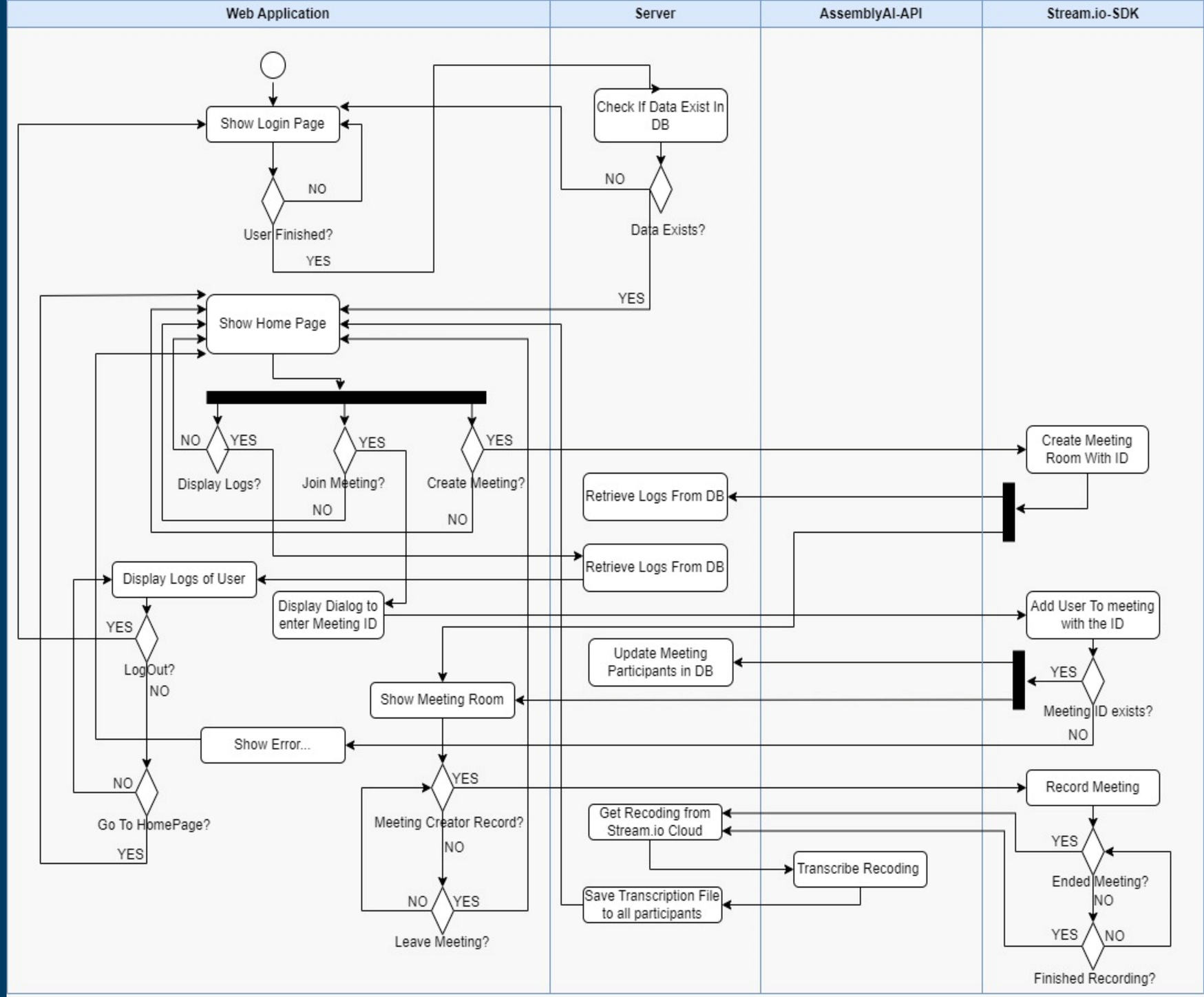
Activity Diagram



Testing

We will evaluate our web application based on its ability to capture high quality recordings and sending them appropriately for the assemblyAI API, and writing the transcription to an organized pdf file, also displaying it for all participant in the specific meeting. In addition, for properly using the API to maintain high transcription accuracy.

Test	Module	Tested Function	Expected Result
1	Web application	Page load	First page load<2s
2	Web application	UI	Responsive and easy to use.
3	Web application	scalability	Application works perfectly when multiple user are using it simulatinsly.

Test	Module	Tested Function	Expected Result
4	Web application	display meeting	Correctly display the meeting room.
5	Web application	Join meeting	Display pop out asking for meeting ID.
6	Web application	Cyber attacks	To block cyber attacks perfectly

Thank you!