INTERNSHIP REPORT

INTERNSHIP DEVELOPED AND DESIGNED BY

NULLCLASS

SELF INTRODUCTION

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PERIOD OF INTERNSHIP: FROM: 20TH JULY 2024 TO: 20TH SEPTEMBER 2024

ADDRESS: 4TH LANE PANDURANGA NAGAR, AMARAVATHI ROAD, GUNTUR, ANDHRA PRADESH, INDIA.

INTRODUCTION:

I am thrilled to present this internship report, which chronicles my three-month journey as a MERN stack web development intern at NULLCLASS from July 20th to September 20th. During this period, I had the privilege of applying theoretical knowledge into practical experience, honing my skills in web development, and contributing to the organization's projects.

Prior to the internship, I was part of the training program for MERN stack web development my project to build real time website like Twitter at NULLCLASS, where I acquired foundational knowledge in MERN stack web development. The internship opportunity allowed me to delve deeper into the field, work on real-world projects, and collaborate with experienced professionals.

Throughout the internship, I worked on my project website like Twitter, which helped me develop a comprehensive understanding of the MERN stack and its applications. This report provides an overview of my experiences, learnings, and achievements during the internship, as well as the skills and knowledge I gained.

BACKGROUND:

NULLCLASS is a pioneering organization dedicated to revolutionizing the education sector by bridging the gap between theoretical knowledge and practical application. Their mission is to empower students with real-world experience, preparing them for the challenges of the modern job market. By focusing on hands-on learning through real-time industrial projects, NULLCLASS seeks to restore the true value of education, going beyond mere grades and certificates.

With a vision to address the growing demand for experienced professionals, NULLCLASS is committed to enhancing skills and providing invaluable real-world experience. By doing so, they aim to make a significant impact on the industry by producing well-equipped and industry-ready individuals.

This aligns perfectly with my internship goals, as I sought to gain practical experience in MERN stack web development and apply my skills to real-world problems.

Learning Objectives:

During my internship at NULLCLASS, I aimed to acquire hands-on experience and deepen my understanding of the following technologies:

1. Front-end development:

- HTML/CSS: Understand the fundamentals of web development, including structuring and styling web pages.

- JavaScript: Learn the basics of JavaScript programming, including variables, data types, functions, and object-oriented programming.

- ReactJS: Master the basics of React, including components, props, state, and hooks.

- Material UI: Learn to implement responsive and visually appealing user interfaces using Material UI components.

2. Back-end development:

- NodeJS: Understand the basics of Node.js, including modules, call-backs, and asynchronous programming.

- Express JS: Learn to build scalable and efficient server-side applications using Express.js.

- MongoDB: Understand the fundamentals of NoSQL databases, including data modelling, CRUD operations, and query optimization.

3. Databases and Storage:

- Firebase: Learn to integrate Firebase services, including authentication, real-time database, and storage, into web applications.

4. Version Control:

- GitHub: Master the basics of Git version control, including repositories, branches, commits, and pull requests.

By achieving these learning objectives, I aimed to enhance my skills in full-stack web development, preparing myself for a career in the tech industry.

Tasks and Activities:

During my internship, I worked on the following tasks and activities to enhance the website's functionality and user experience:

1. Google Authentication: Implemented Google authentication to allow users to sign up or log in using their phone or Google account.

2. User Location Tracking: Developed a feature to track user location, displaying their geographical location (City, State, Country) on the UI using Google Maps API, along with weather conditions.

3. Chatbot Integration: Integrated a chatbot feature, enabling users to ask questions and receive relevant tweets based on their search queries.

4. Audio Upload: Created a feature to upload audio as tweets, with OTP authentication via email, restricted audio length (5 minutes, 100MB), and limited upload times (2 PM - 7 PM IST).

5. Forgot Password: Designed a page and route for resetting passwords using email or phone number, with a password generator feature and limitations on forgot password requests.

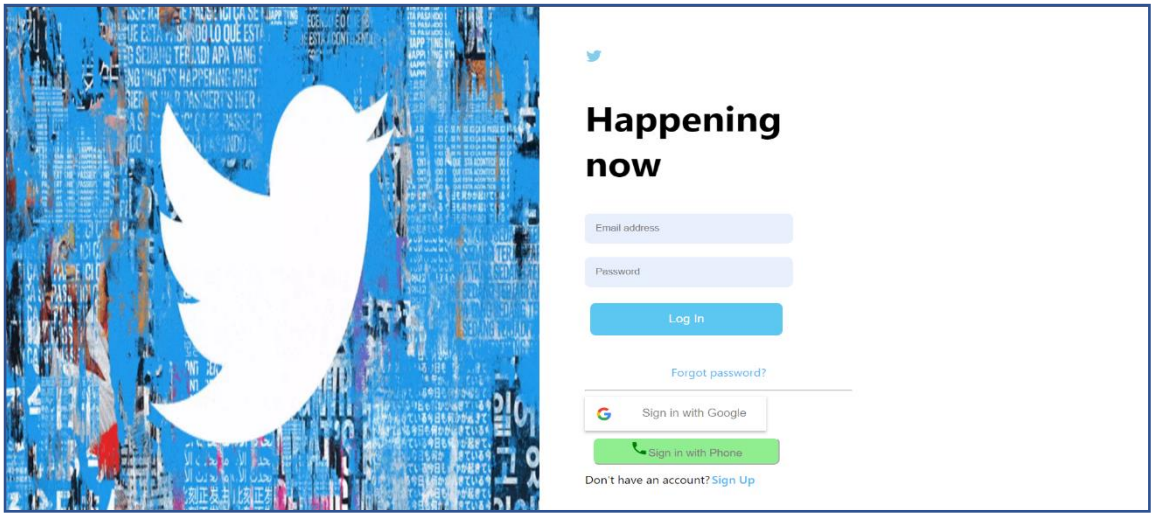
6. Multi-Language Support: Added support for 6 languages (Spanish, Hindi, Portuguese, Chinese, French, English), translating all pages based on user selection, and implementing email and mobile number verification for language switching.

7. User Login Tracking: Tracked user login information (browser, OS, system, IP address), storing it in the database and displaying login history to users, with conditional access based on login device and time.

These tasks and activities aimed to enhance the website's functionality, user experience, and security, while also expanding its features and capabilities.

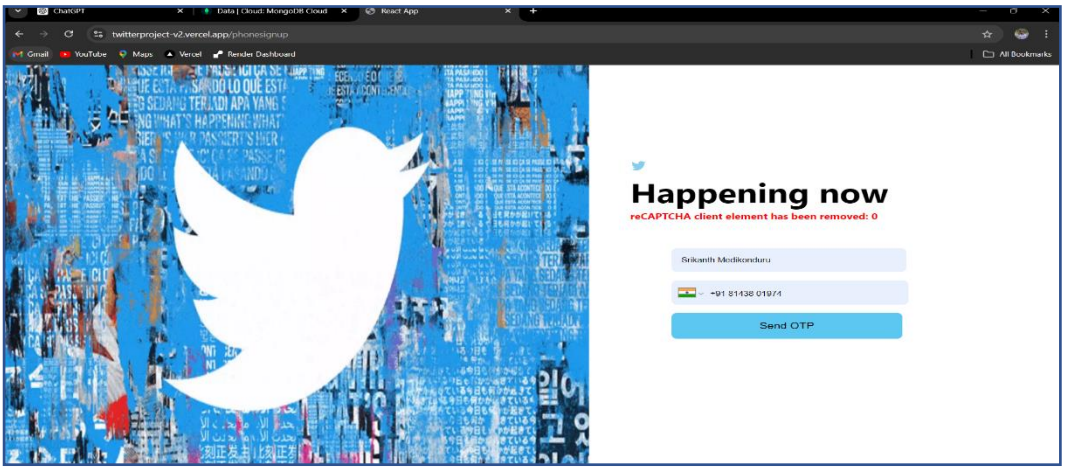
TASK 1: -

GOOGLE AND PHONE AUTHENTICATION



For google authentication I used firebase google sign-in method and also used the react-google-button that I installed from npmjs.com website. I set up this in the auth context too. So that it stores the data of the user in the firebase authentication.

For phone authentication I created a page which will be re-direct the user to a page where a user can use their phone number to login by requesting for an OTP. Both sign-up and sign-in using mobile number will be done in this same page alone.

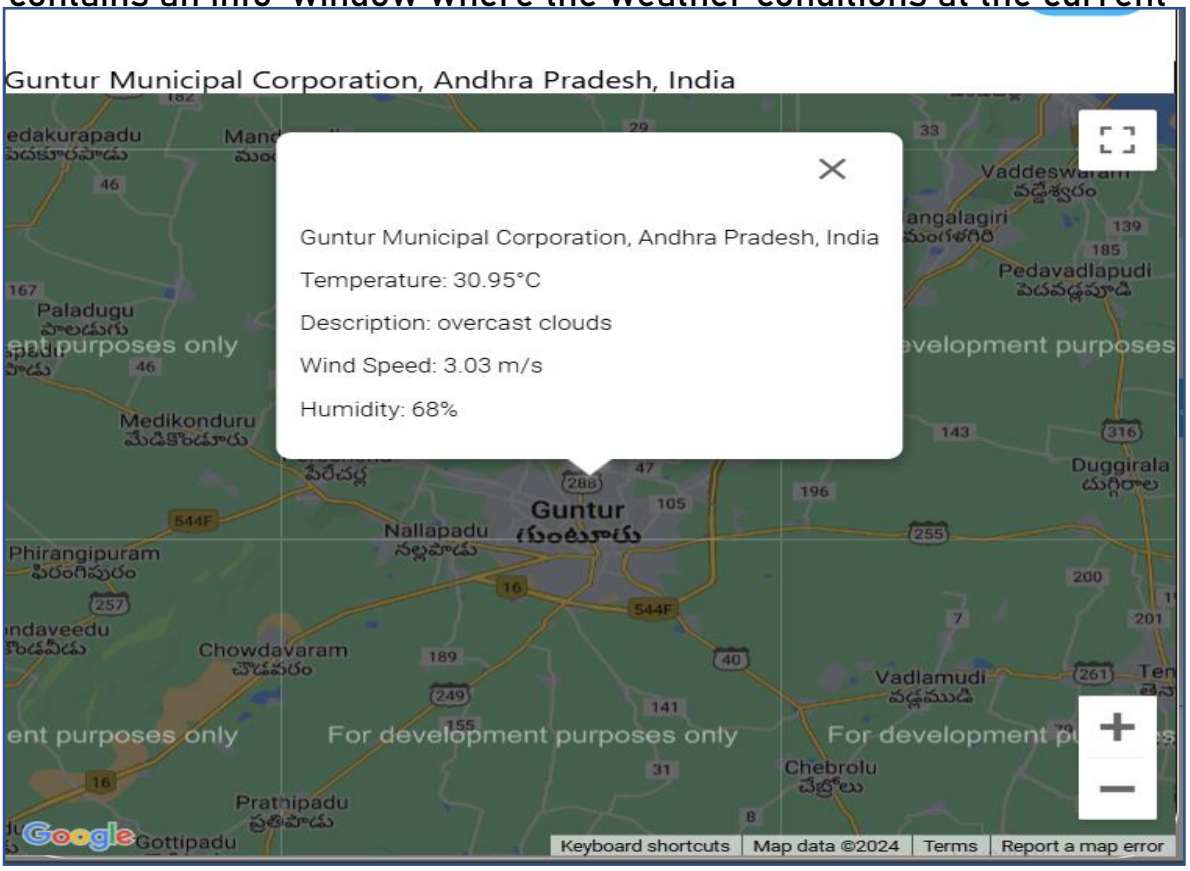


For this authentication technique I set the re-captcha container invisible and set the code from google cloud's JavaScript SDK.I used these codes and developed this page and placed them to work in the authentication context to place the state of the user intact. international-phone-input from npmjs.com website for phone numbers.

TASK 2: -

USER LOCATION TRACKING

The task is to track the user's location and display it along with the weather conditions at that place. For this task I used the MUI modal box to display the map as a pop-up container and views the map that contains an info-window where the weather conditions at the current

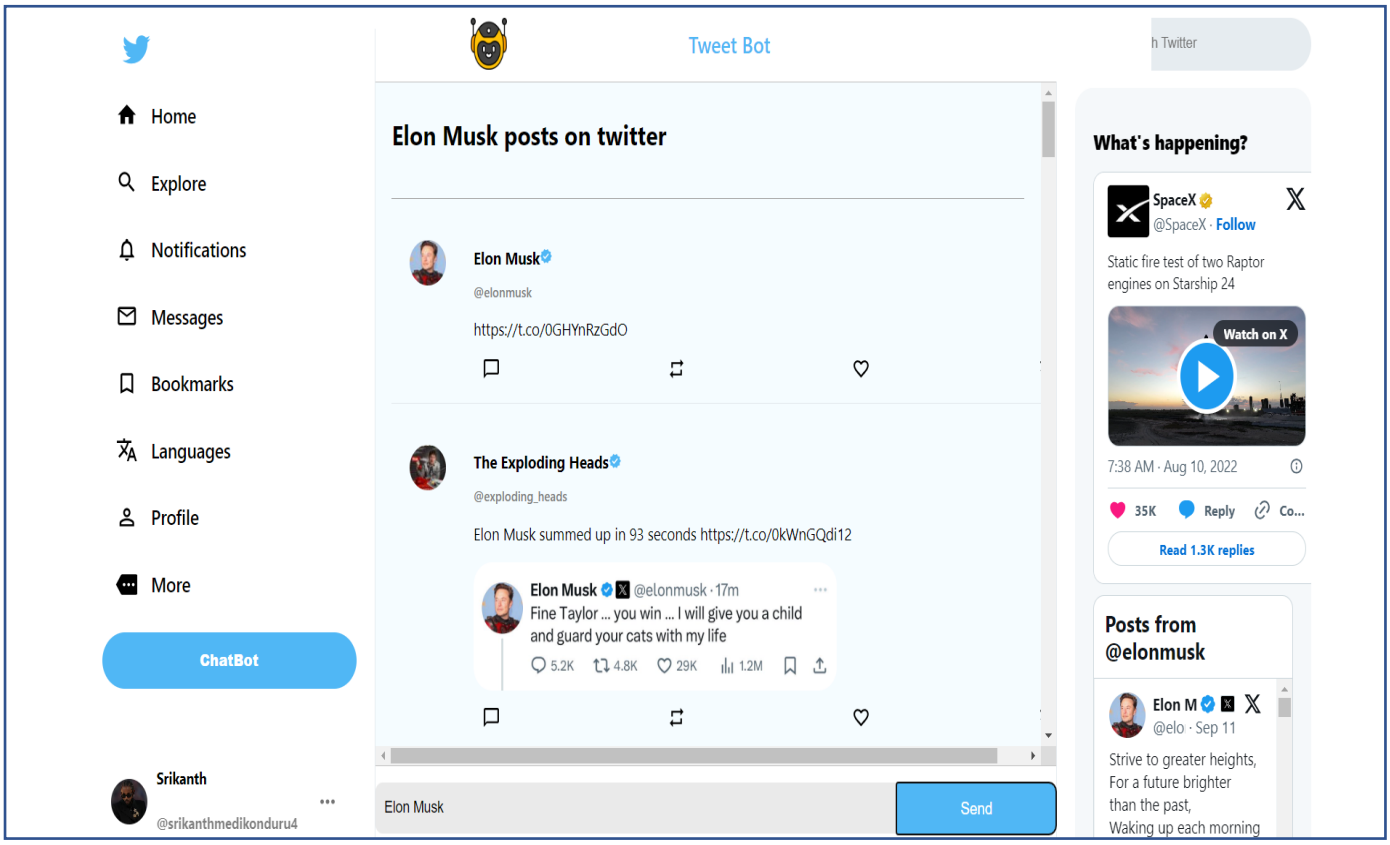


The map displays the city, state and country of the user in the container along with the weather conditions of the user in its info-window. The map component will fetch the user's location by another API nominatim-openstreetmap to visualize the map. The weather is derived by using open weather API. The google Geocoding needs to be enabled billing. The Map is from google maps API I input the map ID.

TASK 3: -

CHATBOT INTEGRATION

The task is to integrate a chatbot into the app which searches for the user's desired tweets. If the user wants to see about anything the user can text the chatbot which instantly searches for the specific tweets over Twitter and displays them in this app.

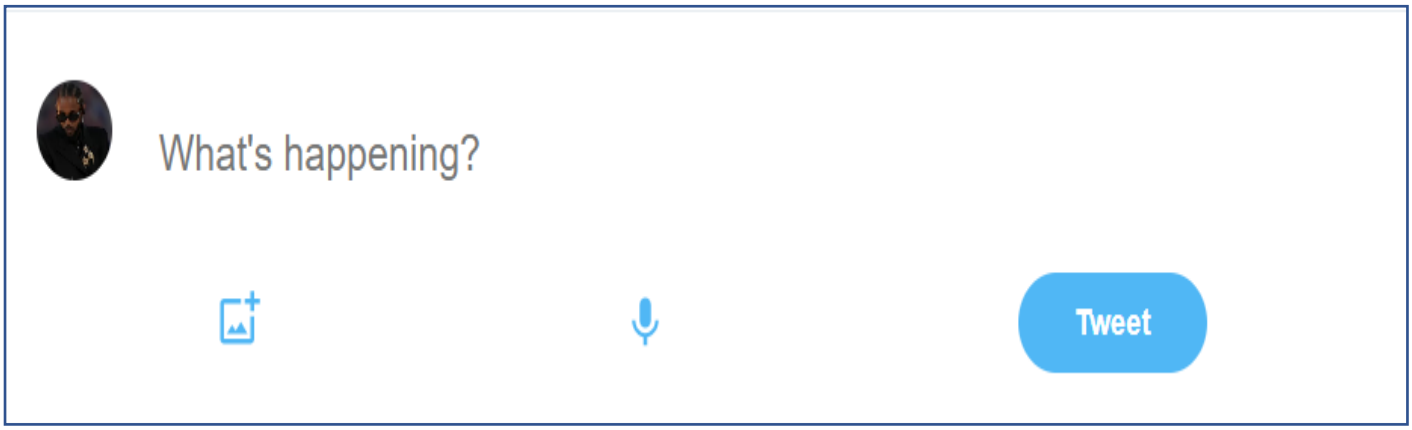


For this chatbot I tried creating it using the twitter's API key I created an API key in twitter's developer website but the twitter's v2 has changed their conditions. So, I have gone through the X-Rapid APIs and searched for twitter after trying three different APIs I found out the Twitter API by Alexander Vikhorev. I used my posts CSS to design the body of the posts in this chatbot. The body is built as a messaging app. The user can directly input their desired word that this API will search for posts related to that word from the Twitter.

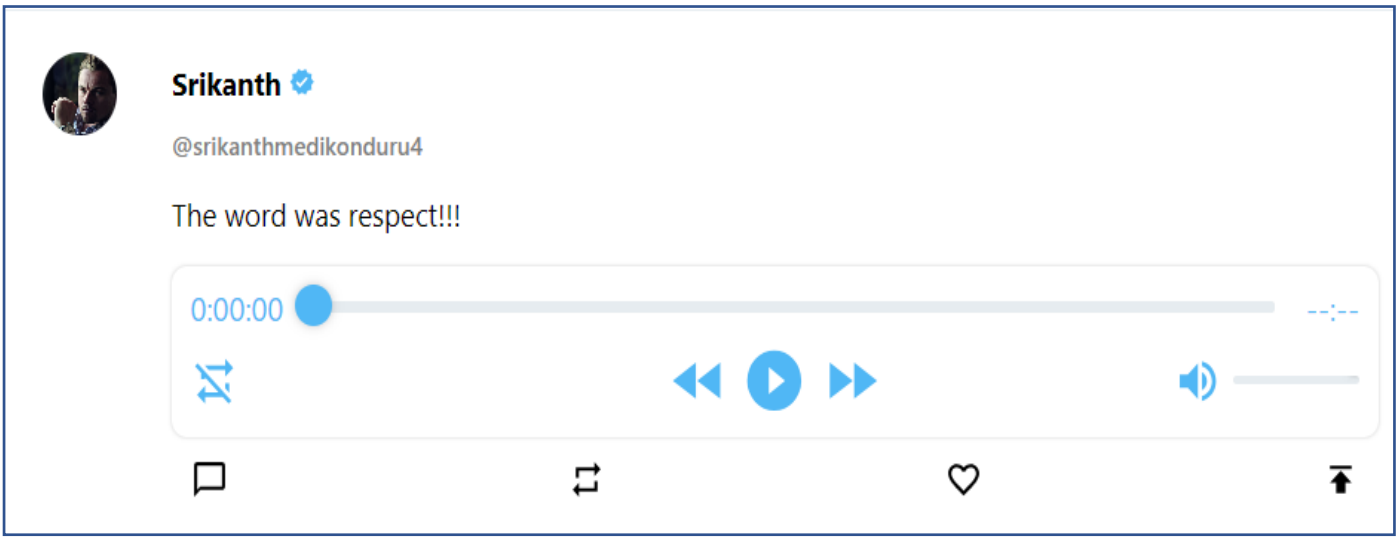
TASK 4: -

AUDIO UPLOADS

The task is to set an option for the user to upload audio by recording them in the app. I used MUI material icons to build microphone in the TweetBox itself. And the user has to authenticate to proceed with the recording also the user must be able to do this in between 2PM to 7PM IST. So, I used sendgird mail service API to send email OTPs. I set time restriction to the recording handling functions.



When the user wants to record the user can simply click on the mic icon to start recording and this mic icon transforms to mic off icon when the user clicks on this mic off icon the user stops the recording. the recorded audio can be reviewed by playing it after recording before posting it.

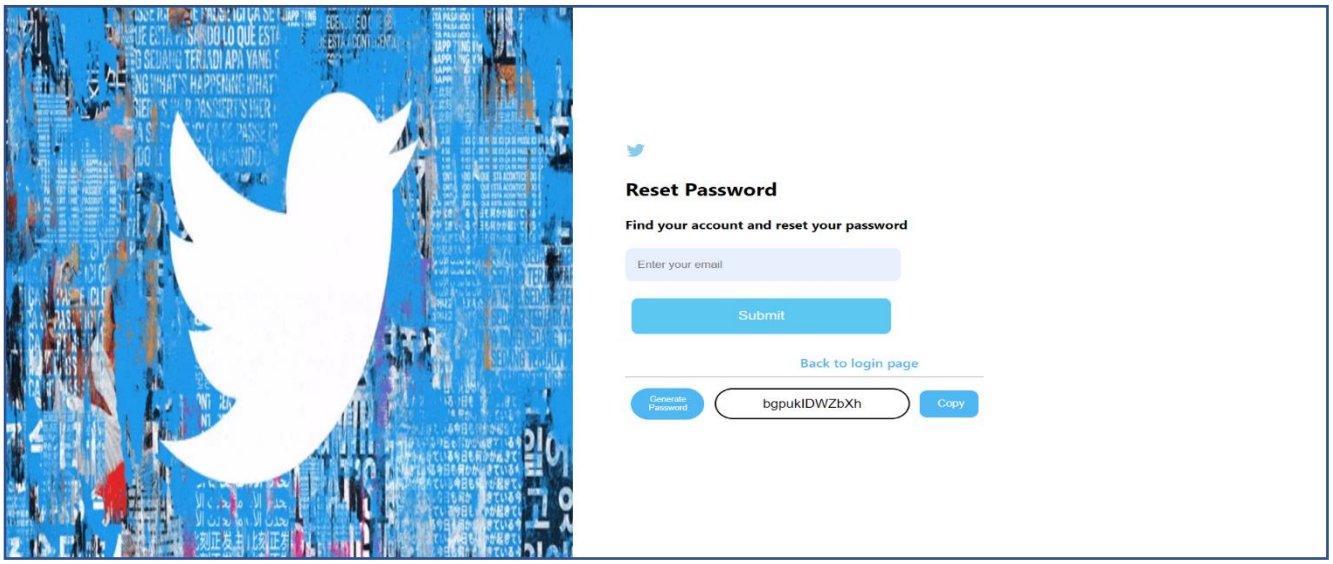


To play these recordings I used react-h5-custom-audio-player and manipulated the CSS to look more likely to my website. The user will have to authenticate within the time line to access this feature.

TASK 5: -

FORGOT PASSWORD

This task is designed to help the user to change their password if they forgot the password. This task has to be routed to another page and used to change the password. The users can create their own password as always. The task needs a password generator to generate a password for the user that can generate using lowercase, uppercase and special characters. I created a password generator and the user can copy the generated password and update their password.



To utilize this option the user has to enter their email ID the firebase will send a email with password reset link the user can generate password and copy the generated password and change it.

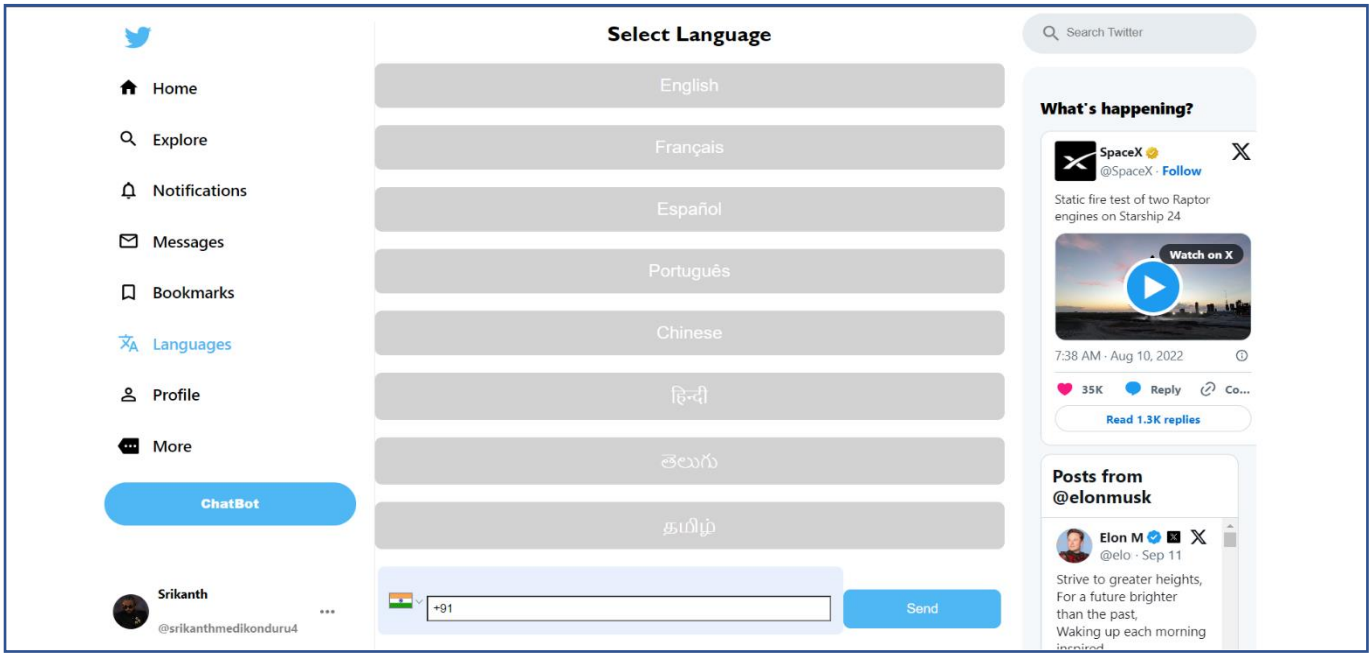
There's another limitation for this changing password. The user can only utilize this option for once a day for their registered email ID that requested for the email ID.

The firebase's SDK is used to create this option and also this is set in the context of authentication to change the state of the user.

TASK 6: -

MULTI LANGUAGE SUPPORT

The task is to set the website be available in different languages. The user can select their desired languages. The task is designed to add 6 languages that are Spanish, French, English, Hindi, Portuguese and Chinese. But I added Tamil and Telugu in addition to these languages explicitly.



To complete this I used I18next to translate everything on the web page to users desired language among these languages I provided them. I did use the google translate to translate all the words to desired languages and used translation keys as they are. The translations were the biggest part of this task. I set up the authentication techniques for this task with send gird mailing API and Twilio API to send mails with OTPs to the users and SMS OTPs to the user. After selecting the desired language, the user has to enter their mail ID if their selected language is French and any other language requires the user's phone number for the authentication.

Reacts I18next and its browser language detection and JSON creation for languages helped a lot to accomplish this specific task simply.

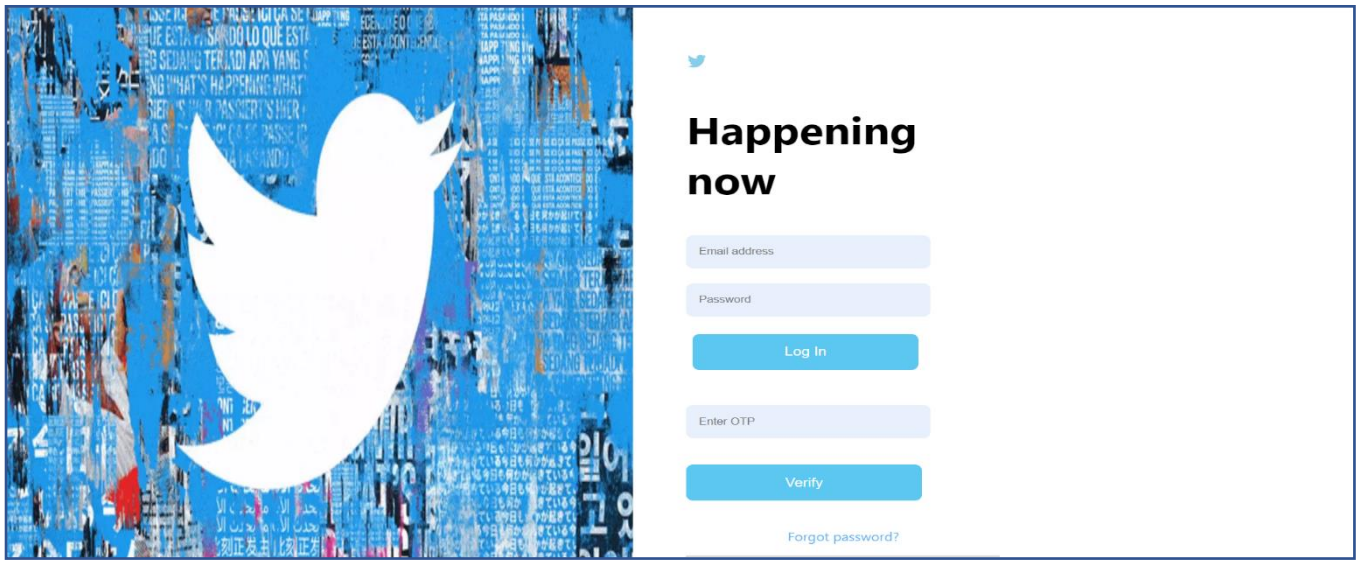
I got to know about I18next watching YouTube videos. I researched a lot for this task to find alternatives but this came very handy.

TASK 7: -

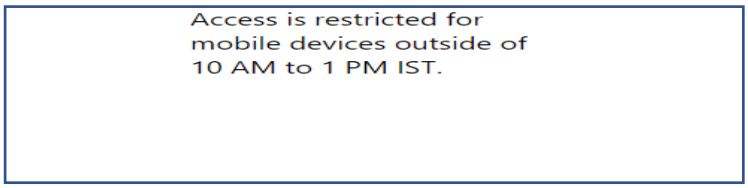
USER LOGIN TRACKING

This task is designed to let the user track their login information. The user can view their previous logins and can simply fetch their login data in notifications page and check their previous logins with the details of the type of device its OS, IP address, browser they used and time of the login. In addition to these. The user login has few restrictions that'll only let the user to login to the app based on a few conditions.

If the user has to login through the Google Chrome browser the user has to get authenticated with OTP to make successful login. The user can only login to the app from 10AM to 1PM if the user's device is mobile. The user will get a message on their mobile's display.



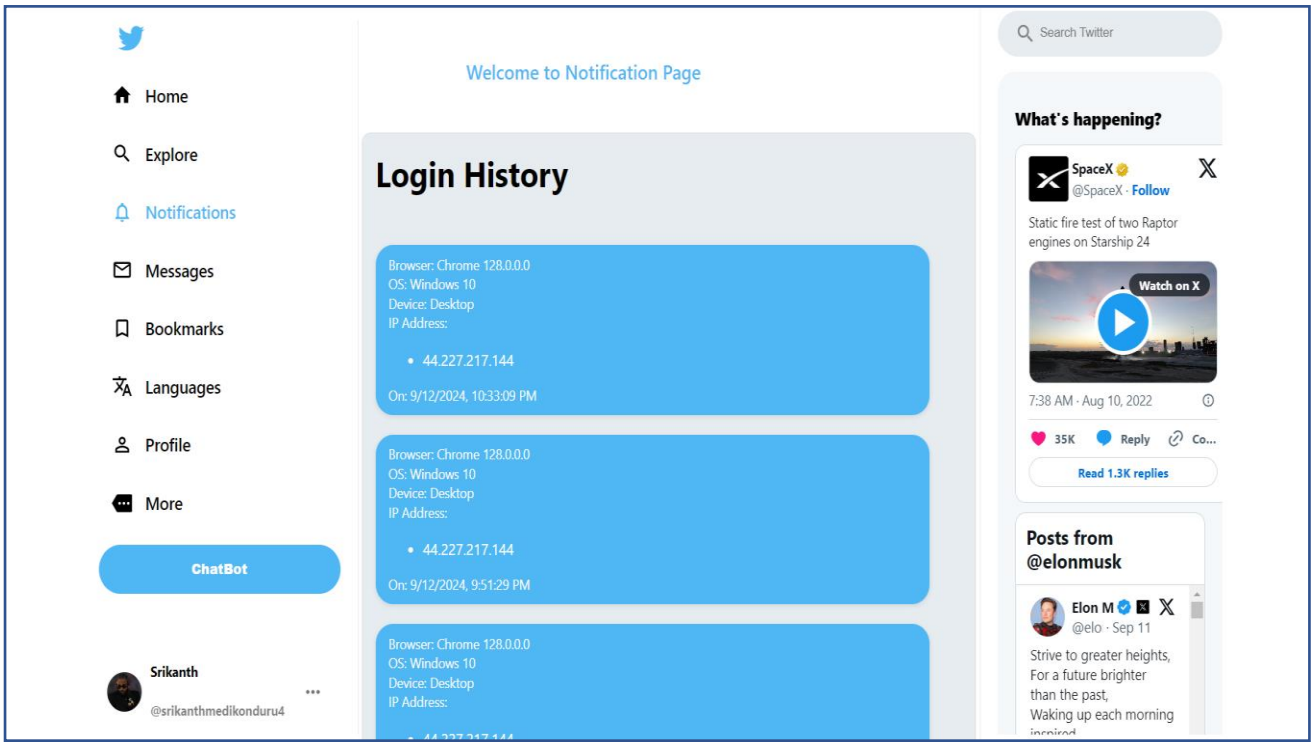
An input field will be displayed if the user is logging in with chrome browser.



The mobile cannot access the app over this time restriction the user will only get to see this message until the time for restriction is in it.

The main part of this task it to implement a login tracking the user has to check their login history in the app.
To achieve this the data has to be collected when the login attempt is made. When the user is logging in the backend automatically collects the user's OS, IP address, browser, device and I set to display this information in the notifications page. The user can view the list of logins based on the time of logins.

I used user parser js for this task to collect all the information and ipify to collect the user's IP address and set the mobile time restriction in the frontend along with the browser control where the chrome login requires authentication. All the data is collected in the backend for protection of the users.



The login history and its data are viewed in notifications page. The data that is viewed in this page are a list type of view like a message box of a group chat. I created them to look more alike chat bubbles that are one-sided.

SKILLS & COMPETENCIES: -

Programming languages:

- Proficient in JavaScript, HTML/CSS, and ReactJS
- Experience with NodeJS, ExpressJS, and MongoDB

Web development:

- Strong understanding of front-end and back-end development
- Experience with responsive web design and Material UI

Databases:

- Knowledge of NoSQL databases, specifically MongoDB
- Understanding of database modeling and query optimization

Authentication and Security:

- Experience with Google authentication and OTP verification
- Understanding of password encryption and secure password generation

Problem-solving and Debugging:

- Strong problem-solving skills, with ability to debug and troubleshoot issues
- Experience with testing and validating code
- Experience with version control using GitHub

Adaptability and Learning:

- Ability to quickly learn new technologies and frameworks
- Experience with implementing new features and functionality
- Material UI: Learned to integrate Material UI icons and modals into my code
- Research Skills: Improved ability to phrase doubts, search for solutions, and utilize

Feedback & Evidence: -

As I worked independently on this project without direct mentorship, I relied on self-directed learning and online resources to overcome challenges. Despite the lack of guidance, I successfully completed the project, demonstrating my ability to work autonomously and adapt to new technologies.

Evidence of my work and progress includes:

A fully functional web application built using MERN stack and React JS

Code repositories on GitHub showcasing my contributions and commits

Screenshots and videos demonstrating the application's features and functionality

Personal reflection and self-assessment of my learning journey and problem-solving strategies

I often felt very de-motivated, deprived and feared of not completing tasks. I searched a lot on YouTube and google to find many alternatives to replace tasks getting tougher. Despite all the hardship I found myself worthy on accomplishment of every other task I performed. Which gained me a confident self-guidance and unbreakable motivation each time which kept me going to finish every task I performed.

Gained self-motivation, self-guiding skills and learning skills all by myself which made this internship a wonderful experience to self-evaluate myself.

CHALLENGES: -

- Understanding GitHub workflows, committing changes, and uploading code for version control

- Configuring Vercel and Render deployments

- Implementing user authentication and state management using Firebase

- Maintaining user state consistency across app refreshes

- Designing CSS layouts, loaders, and body blocks for optimal viewing

- Setting up user state differentiation based on IDs, emails, and phone numbers

- Integrating audio recording and uploading functionality

- Finding a suitable chatbot solution within the app

- Implementing Twitter API for chatbot functionality

- Sending emails and SMS notifications

SOLUTIONS: -

- Researched and practiced GitHub workflows, commits, and uploads

- Configured Vercel and Render deployments successfully

- Implemented Firebase authentication and state management

- Utilized logged-in user hooks to maintain user state consistency

- Designed reusable CSS components for efficient styling

- Developed conditional logic for user state differentiation

- Integrated Cloudinary API for audio uploading

- Explored various chatbot options, settling on Alexander Vikhorev's Twitter API

- Implemented SendGrid and Twilio APIs for email and SMS notifications, respectively

- Switched to Seven SMS for broader SMS functionality.

-Bought Google cloud console to send SMS authentication.

Outcomes: -

1. Successfully developed a full-stack application: Using the MERN (MongoDB, Express, React, Node.js) stack, I built a comprehensive web application that integrates front-end and back-end functionalities.

2. Improved coding skills: Through this project, I enhanced my proficiency in JavaScript, HTML, CSS, and various frameworks/libraries (React, Express, Node.js).

3. Gained experience with database management: I learned to design, implement, and interact with a MongoDB database, ensuring data consistency and efficiency.

4. Enhanced problem-solving abilities: Overcoming challenges and debugging issues improved my analytical thinking and creative problem-solving skills.

5. Familiarity with Agile development methodologies: I applied iterative development principles, iterating on feedback and refining the application.

Impact: -

1. Enhanced career prospects: Acquiring MERN stack expertise expands my job opportunities in the web development industry.

2. Improved collaboration skills: Working on this project taught me effective communication, version control (Git), and teamwork principles.

3. Personal growth: Completing this project boosted my confidence in tackling complex projects and learning new technologies.

4. Foundation for future projects: This experience provides a solid base for exploring more advanced technologies and building larger-scale applications.

5. Contributed to personal portfolio: This project showcases my skills and accomplishments, enhancing my professional portfolio.

CONCLUSION: -

In conclusion, my journey with the MERN stack and JavaScript has been a transformative experience, marked by challenges and triumphs. Through perseverance and dedication, I overcame obstacles in GitHub version control, deployment configurations, user authentication, and chatbot integration. I developed a deeper understanding of React JS, CSS, and Firebase, and successfully implemented features like audio recording and notification systems. Although faced with setbacks, such as Twitter API changes and SMS notification limitations, I adapted and found alternative solutions. This project has not only honed my technical skills but also taught me the value of resilience and creative problem-solving. I am proud of what I have accomplished and look forward to continuing my growth as a web developer.

As I reflect on my experience, I realize that I have grown both technically and personally. I have developed a stronger sense of self-reliance, learning to trust my instincts and troubleshoot issues independently. I have also become more curious, eager to explore new technologies and techniques to enhance my skills. I am excited to apply the knowledge and expertise I have gained to future projects, pushing myself to innovate and improve with each new challenge. Through this journey, I have discovered a passion for web development that I am eager to continue nurturing, and I am confident that my skills and determination will take me far.

I am now seeking to look forward for my career in a tech company where I could possibly use these skills that I've learnt to show case the skillset I've learnt during this internship and work on a few personal projects. I want to be a part of any project that has MERN stack web development. To showcase my skillset and develop the communication with other participants of a group and enhance my team membership. I got confident enough to work with this skillset.

I thank the people at NULLCLASS for giving me this glorious opportunity for making me gain a skillset during this internship and training program.