SMART INDIA HACKATHON 2024

Problem Statement ID –

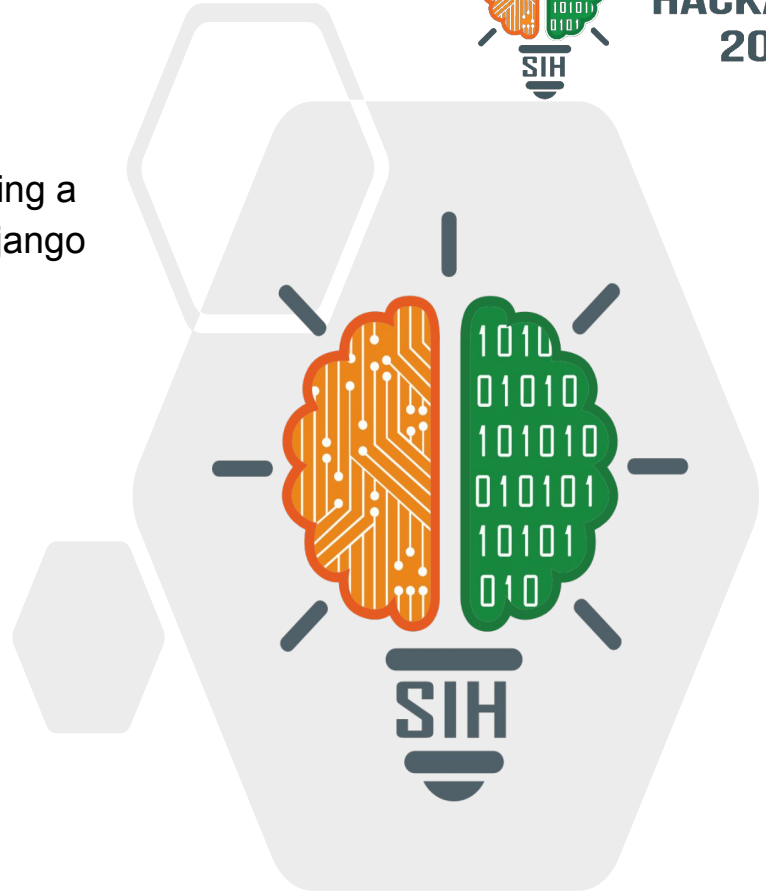
Problem Statement Title- Building a Modern Version of SocialCalc using Node.js, Go, or Django can use AI tools like copilot.

Theme-

PS Category- Software

Team ID-

Team Name- Pied Piper



IDEA / SOLUTION :

Developing an a web based spreadsheet application inspired by SocialCalc

- User Authentication that takes user data and stores it in MongoDB database.
- Two models are used: sheets and users.
- Spreadsheet in which we can perform deletion, addition, subtraction.
- User authentication for more safety.

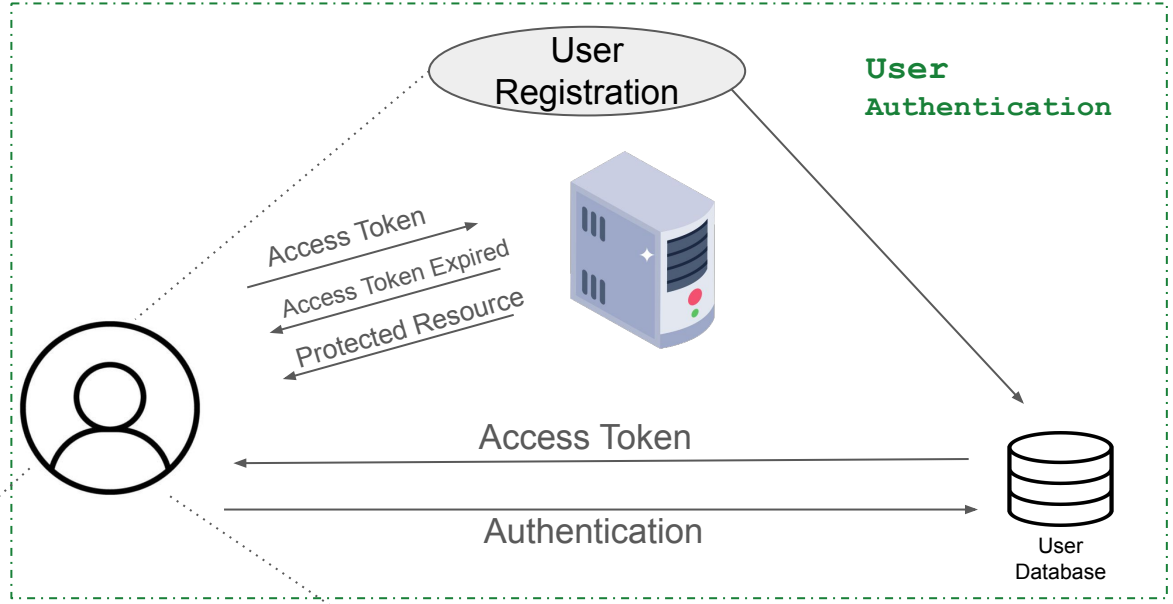
Problem Resolution:

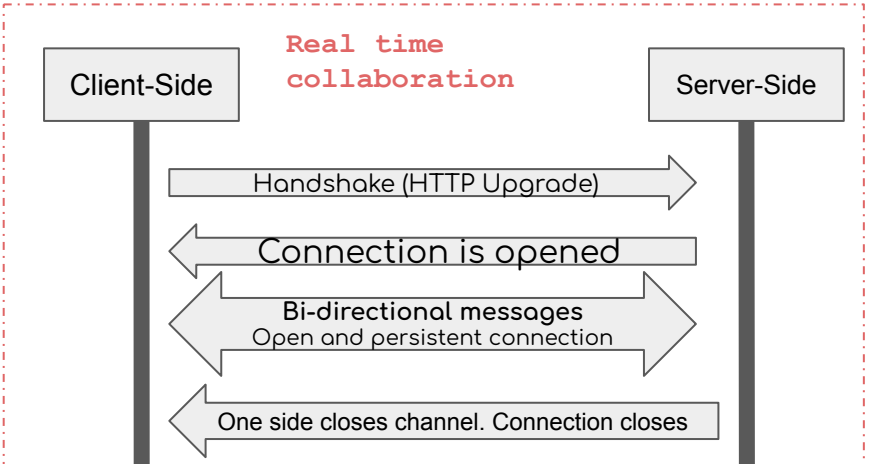
A web-based spreadsheet application that has basic spreadsheet operations and User Authentication for security purposes It allows real time collaboration and integration with external API's

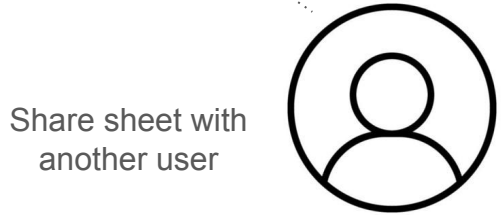
- Importing data from Excel file into MongoDB using Node .js
- Using Multer to handle the file on the backend.
- When a client makes changes, those changes are sent to the server, which updates its state and broadcasts the new state to all other clients.

Spreadsheet functionality

- Delete Sheet
- Delete Column
- Delete Row
- New Sheet
- Update Sheet
- Add Row

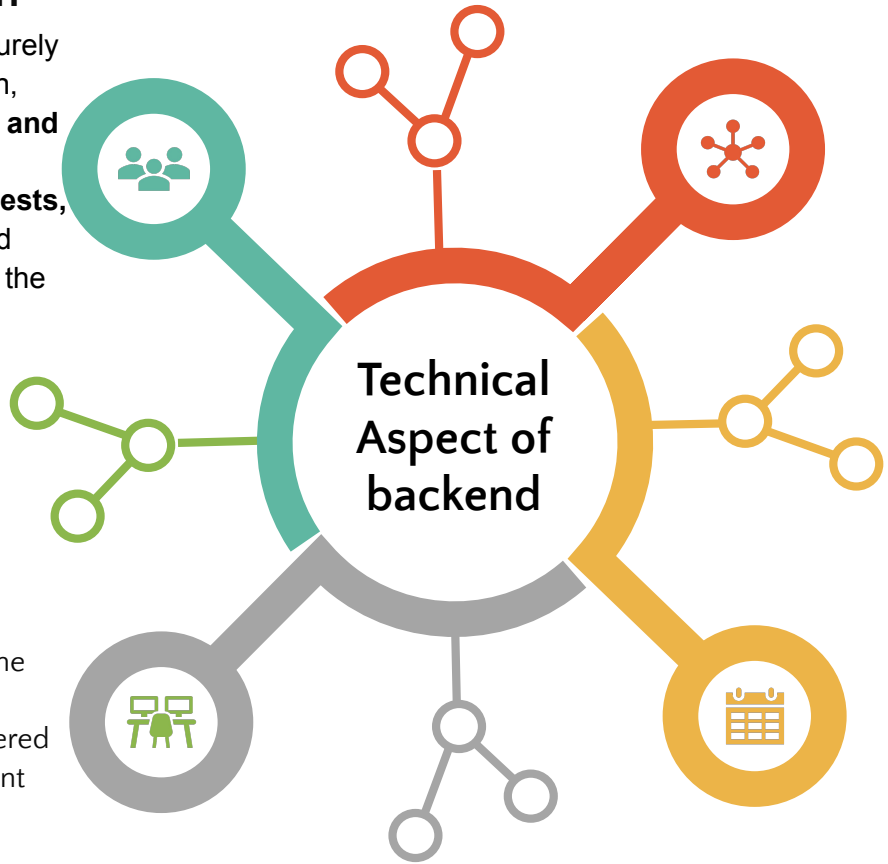






User Authentication

Users sign up, and the server securely stores their credentials. Upon login, valid credentials generate **access and refresh tokens.**
Access tokens **authenticate requests,** while refresh tokens renew expired access tokens. Logout invalidates the refresh token.



Spreadsheet Functionality

POST createsheet
PUT update-sheet
PUT share-sheet
GET getallsheets
GET gensinglesheets
DEL delete-sheet
DEL column
DEL row

Real Time Collaboration

Websocket server shares the same port as HTTPS. A set of clients is made. connection' event, is triggered whenever a new WebSocket client connects.

Integration with external API's

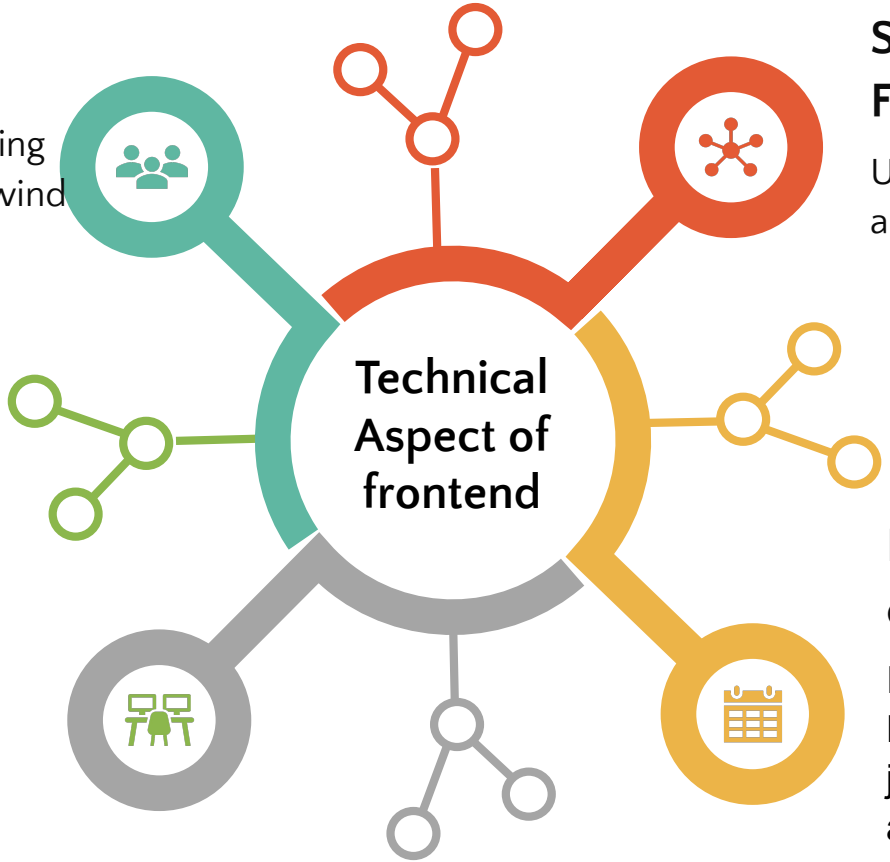
Allowing users to import and export data from API's like Ms. Excel into Mongodb.

User Authentication

User Authentication Page using shadCN/ui and react and tailwind

Real Time Collaboration

Basic javascript using react



Spreadsheet Functionality

Using react and AG grid and tsailwind

Integration with external API’s

Integration with external API'S HTTP requests from the node js environment or external api's are made using a popular js library Axios

Feasibility and Viability

Analysis of the feasibility of the idea

1) The idea of modernizing SocialCalc is feasible from a technical and operational standpoint, with the potential to address a clear market need.
2) However, careful attention must be paid to managing development costs, ensuring scalability, and differentiating the product from existing competitors to make it economically viable and competitive in the market.

Potential challenges and risks with solutions

Risk

Clashes and loss of data due to simultaneous edits while implementing real time collaboration.

Solution

Conflict resolution in real-time collaborative applications is crucial to ensure that simultaneous edits by multiple users do not result in inconsistencies or data loss.

Implement algorithms like **Operational Transformation (OT)** or **Conflict-free Replicated Data Type (CRDT)** to handle concurrent edits.

Deployment & Scalability

Selecting a hosting platform, such as AWS, GCP, or Azure. For cloud deployment, utilize services like AWS Elastic Beanstalk, GCP’s App Engine, or Azure App Service, and set up a reverse proxy using Nginx with SSL for secure access. Next, perform database migrations, monitor application performance using tools like Prometheus or CloudWatch, and enable auto-scaling to handle varying traffic loads. Implement a CI/CD pipeline for continuous deployment with GitHub Actions or Jenkins, and consider Blue-Green or Canary deployment strategies to minimize downtime.

Utilizing cloud services like AWS, GCP, or Azure allows for automatic scaling of resources, adapting to traffic fluctuations in real time. Additionally, implementing efficient database management, caching strategies, and asynchronous processing ensures that the application remains responsive and reliable as it grows.