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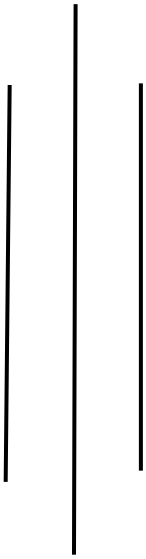

PROJECT PROPOSAL ON 'MITRATA'

PRESENTED TO DEPARTMENT OF ELECTRONICS AND COMPUTER ENGINEERING

BY

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We are thankful and fortunate enough to get constant encouragement, support and guidance from our senior brothers and sisters. There constant support is always encouraging and inspiring. Also, we would like to extend our sincere esteems to the Department of Electronics and Computer Engineering for granting us such a platform of doing project work. So, we would like to express our sincere gratitude to our teachers for providing us such a challenging task which would enhance our skills and our knowledge related to the Data Structure and Algorithm.

Last but not least we would like to thank the people out there on the internet whose resource we may have to use. It is because of those free and open source resource that many of our work becomes extremely easier.

Introduction

Communication is one of the fundamental aspects of human existence. The advancement in science and technology has digitalized the communication sector. It is not as conventional as it used to be a 100 years ago. It has grown to be much more than just expression of one's thought. Apps like Facebook, Snapchat, Twitter are defining the driving the standards to a whole a new level. This is why it holds an even deeper importance in today's world.

Bringing the concepts of Data Structure and Algorithm and the need for a suitable medium of communication we have decided to make a social networking site. We have named this site 'Mitrata' which translates to friendship in English.

Mitrata will be a web-based app which provides the user with a platform to get to know other people and communicate with them. In the further proceeding of this proposal we have outlined the objectives, methodology and description of our project.

Objective

The main objective of our project is

- To learn the concept of Data Structure and Algorithm
- To learn to implement Web Socket and HTTP server
- To learn to use front end framework like React
- To learn to implement database for an application
- To learn to work in team

Proposed System

Description

The application is divided into three parts, the client, the server and the database. Each handling a specific part of the application. They have been further explained in detailed below.

Frontend: This is the client-side of the application. This is the part which is visible to the user. The user interacts to the application through this part of the app. This part mainly deals with the design and layout of the content to be displayed to the user. It encompasses login, sign up, User feed and chat room pages. On top of HTML, CSS and JavaScript this page will be made with JavaScript framework called **React.**

Backend: It is the part of the app responsible for **handling the logic and data storage for the application**, as well as providing an API for the frontend (client-side) of the application to communicate with. The frontend **request** for the data to this part of the application and Backend sends a **response** accordingly. To provide the data or to store the data it reads or writes the database.

Database: Database stores all the data of all the users so that they can be referenced later. Database is only accessible to the backend server. All the data in the database will be in binary format so that it occupies minimum space possible. All the low-level handling and the manipulation of the data will be done by the database. A high-level interface will be provided by it to the backend server

Block Diagram

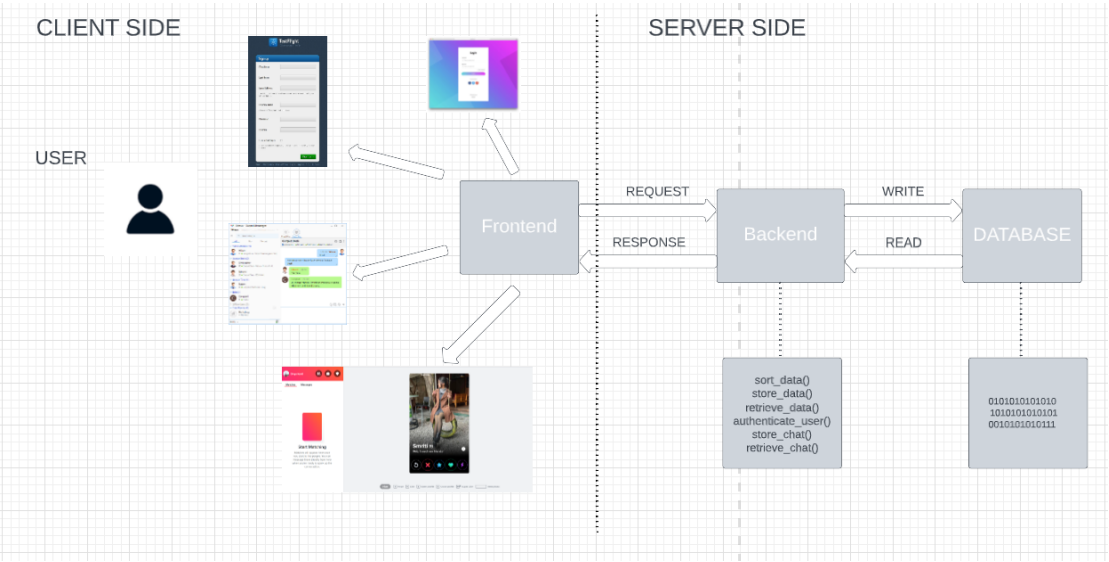

Fig: Basic block diagram of Mitrata

Methodology

Our application will be written in **JavaScript** Programming Language which runs on Node. Node is a runtime environment for JavaScript. We choose JavaScript because of its rich libraries that makes us easier to build the project.

For client side we will be using JavaScript language because of its simplicity and also because of the fact that there are already multiple frontend frameworks available. Among many such alternative framework we will be using one of the most popular frontend frameworks out there which is **REACT**.

React is a JavaScript library for building user interfaces. It allows us to build **reusable UI components** and manage the state of an application **virtual DOM** in an efficient way. React uses a, which improves the performance by reducing the amount of DOM manipulation required.

For styling the frontend elements i.e. HTML we have opted to use **Bootstrap**. Bootstrap is a **class-based CSS** library where the classes are predefined with some styling. These classes need to be added to the HTML element to beautify them.

For backend we will be using ‘ **Socket.IO** ’ . Socket.IO is a library that enables **low-latency**, **bidirectional** and **event-based** communication between a client and a server.

Use of Data Structure and Algorithm in ‘Mitrata’

The different type of data structures we intend to use in the projects have been listed below: -

Linked List: The user’s suggestion in the frontend part of the program will use singly linked linear linked list. We also intend to use doubly linked circular list to display the user info.

Hash tables: for storing user information, mapping user IDs to chat sessions, etc.

Stacks: for storing and retrieving the chat history.

Queues: for managing and prioritizing incoming messages and requests.

Trees: for storing the data in certain hierarchy so that it can be quickly accessed based on that hierarchy. That basis can be the preference or gender of the user. This helps to optimize the time required to retrieve the data to be displayed

The different type of algorithms that we may use in the application are as follows: -

Search algorithms: for finding and retrieving specific chat history or user information.

Sorting algorithms: for organizing and displaying chat history in a specific order (e.g. by date, by sender, etc.).

Pattern matching algorithms: for detecting and filtering out spam messages or profanity.

Encryption/decryption algorithms: for securing the communication between the clients and the server, protecting sensitive information such as user passwords.

Conclusion

In conclusion, the proposed project titled ‘Mitrata’ is a comprehensive and well-planned initiative undertaken to address the need of a simple and easy to use social networking site. We have carefully considered all aspects of the project, including a thorough research on the existing apps out there and their negative aspect so that we may eliminate those issues in our own design.

In this proposal, we have outlined the objective of the project and the methodology that we will be using to achieve this. We are confident that with the support of our teacher, friend and seniors, this project will be able to achieve the goals we have set out.

We are eager to move forward with this project and believe that it will be able to deliver on its aim and purpose. We look forward to the opportunity to collaborate with our team members and taking the necessary help from the teacher and seniors to make this project a reality. We are confident that by working together we can overcome any obstacle that may obstruct us.