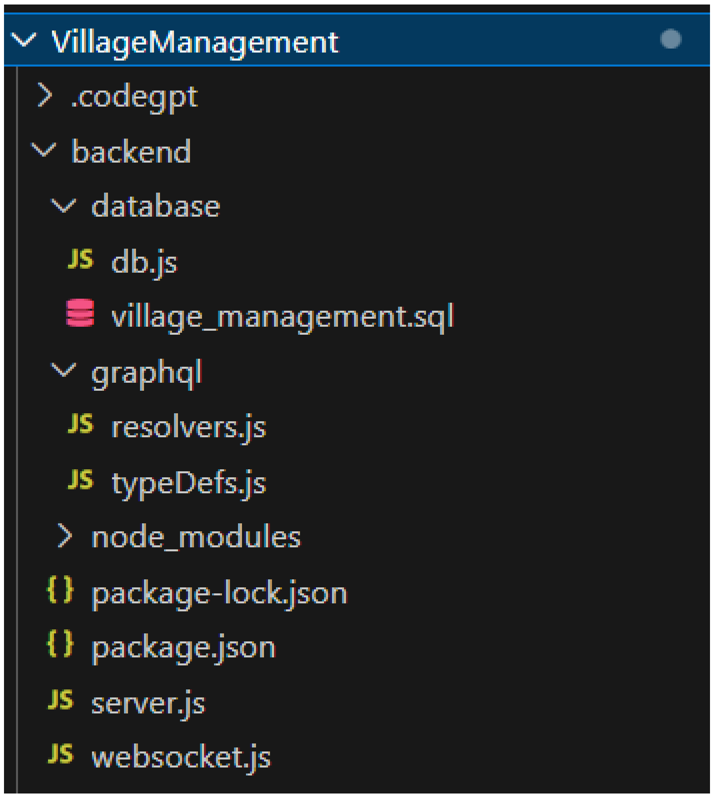
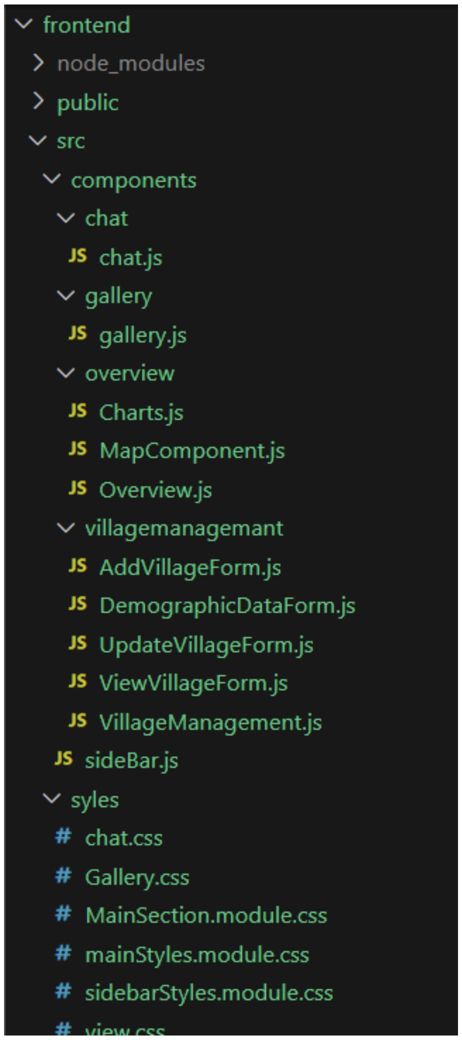
Village Management Project

1. Frontend & Backend Structure



```
VillageManagement
  .codegpt
  backend
    database
      db.js
      village_management.sql
    graphql
      resolvers.js
      typeDefs.js
    node_modules
    package-lock.json
    package.json
    server.js
    websocket.js
```



```
frontend
  node_modules
  public
  src
    components
      chat
        chat.js
      gallery
        gallery.js
      overview
        Charts.js
        MapComponent.js
        Overview.js
      villagemanagemant
        AddVillageForm.js
        DemographicDataForm.js
        UpdateVillageForm.js
        ViewVillageForm.js
        VillageManagement.js
      sideBar.js
    syles
      chat.css
      Gallery.css
      MainSection.module.css
      mainStyles.module.css
      sidebarStyles.module.css
      view.css
```

Frontend

• Technologies Used:

- The frontend is entirely built using React.

- Additional libraries are used to enhance display and interaction, such as react-leaflet and leaflet for embedding interactive maps.

• Component Structure:

- The interface is divided into independent and reusable components.

- Each component serves a specific function and has its own design.

• Key Components:

1. Login and Sign-Up Page:

   - Enables users to log in or create a new account.

2. Main Sections of the Project:

  - Overview Section:

    - Contains the map component to display the locations of villages.

    - Uses the react-leaflet library to include interactive maps.

    - Places markers to identify village locations.

    - Displays charts and statistics about the villages.

    - Utilizes chart libraries like Chart.js or Recharts for attractive information presentation.

Backend

• Technologies Used:

- Express with Node.js to create the server.

- Apollo Server to support GraphQL usage.

• Application Layers:

1. Routes:

  - Defines endpoints to route requests.

2. Middleware:

  - Handles authentication using JWT.

3. Controllers:

  - Processes requests and returns appropriate responses.

4. Services:

  - Core business logic such as database interactions.

• Security:

- Uses JWT for authentication and authorization.

- Passwords are encrypted using bcrypt.

- Manages sessions and identifies the current user through the is_logged_in property in the database.

2. Database

• Database Name: village_management

• Database Type: MySQL

Main Tables:

1. Gallery Table:

- Purpose: Stores images related to the villages.
- Fields:
  - id: Unique identifier.
  - imgBase64: Base64 encoded string of the image.
  - imgText: Description of the image.
  - createdAt: Creation date.

2. Messages Table:

- Purpose: Stores messages between users.
- Fields:
  - id: Unique identifier.
  - sender: Sender's name.
  - recipient: Recipient's name.
  - text: Message text.
  - timestamp: Time of sending.

3. Users Table:

- Purpose: Manages user data.
- Fields:
  - id: Unique identifier.
  - username: Unique username.
  - password: Encrypted password.
  - full_name: Full name.
  - role: User role (admin or user).
  - is_logged_in: Login status.
  - profile_image: Link to profile image.

- email: Unique email address.

4. Villages Table:

- Purpose: Stores village data.
- Fields:
  - id: Unique identifier.
  - name: Village name.
  - region: Region.
  - land_area: Land area.
  - latitude and longitude: Geographic coordinates.
  - image: Image link.
  - tags: Keywords.
  - population: Population count.
  - population_distribution: Population distribution (JSON).
  - gender_ratios: Male and female ratios (JSON).
  - population_growth_rate: Population growth rate.

3. Chat System

• System Description:

- A system for exchanging messages between users.
- Relies on the messages table to store messages.
- Supports sending and receiving messages with timestamps and user identification.

4. GraphQL

• Description:

- Integrated GraphQL to enhance APIs.
- Utilizes Apollo Server to manage data queries.
- Allows users to query data flexibly according to needs without fetching unnecessary data.

Additional Notes:

• Base64:

- Used for compressing images and uploading them to the database for storage.

• JWT:

- Manages authentication and authorization processes.

- Tracks the current user for displaying and managing their personal data.

• bcrypt:

- Encrypts passwords to ensure security.

- Validates password matches during login.

• Express & SQL Integration:

- Creates a server using Express.

- Integrates with MySQL for database operations.

• Apollo Server:

- Used to support GraphQL queries, making data access more efficient and faster.

3. Chat System

• System Description:

- A system for exchanging messages between users.

- Relies on the messages table to store messages.

- Supports sending and receiving messages with timestamps and user identification.

- The chat system uses sockets, allowing users to send messages to any chosen admin.

- Messages are stored in the database for preservation, and admins can view users who sent messages upon login and can respond to them.

User Gallery:

• Each user will have a personal photo gallery where they can add photos and locations they have visited.

Admin Photo Addition:

• Admins can add photos, which will be visible to all users in the public gallery.

Image Search Feature:

• There will be a search feature within the gallery based on the description of the image to facilitate finding added photos.