Minor Project #2

Full Stack Expense Sharing System (Pair-wise Owes Model)

Important Dates

- Submission Deadline: 18 February 2026
- Viva / Grading: 19 February 2026

Project Objective

Build a full-stack web application that allows a group of people to track shared expenses and automatically calculate who owes whom. The system must use React for frontend, Node.js with Express for backend, and file system (fs) for JSON-based persistence.

Core Concept

The application will display pair-wise debts (e.g., X owes Y ■Amount). After every expense, debts must be recalculated automatically. If two members owe each other money, the system must cancel the difference and show only the final net amount.

Functional Requirements

- Add and view group members (no duplicate names).
- Add expense with: Paid By, Amount, Description.
- Equal split among all members.
- Automatic recalculation of pair-wise debts after each expense.
- Automatic internal cancellation between members.
- Dashboard showing all debts (red = owes, green = receives).
- Member filter view to display individual calculations.
- Transaction history showing all recorded expenses.

Technical Stack

- Frontend: React, JavaScript, CSS

- Backend: Node.js, Express
- Storage: JSON file using fs module
- Single group system (no authentication, no database)

Required Backend APIs

- POST /members
- GET /members
- POST /expenses
- GET /expenses
- GET /debts
- GET /transactions

Learning Outcomes

- Build REST APIs using Express.
- Read and write JSON data using fs.
- Connect React frontend with backend APIs.
- Implement business logic for financial calculations.
- Handle derived data and state updates properly.