Product Specification - Expense Sharing System

# 1. Project Overview

This project aims to build a web-based system that enables fair and transparent expense sharing among participants in one-time social events. The system calculates how much each person should pay or receive based on what they consumed and contributed, including participation fees.

# 2. Goals

- Provide a clear and fair calculation of expenses between participants.  
- Ensure that only participants who consumed specific categories are charged accordingly.  
- Allow deduction of a general participation fee from overall event expenses.  
- Display minimal necessary money transfers between participants.  
- Keep the system simple and easy to use.  
- Enable saving and resuming event data at any stage.

# 3. Target Users

The system is intended for individuals organizing or participating in one-time social events such as trips, group meals, or shared activities.

# 4. Core Features

- Event creation with a defined name and participation fee.  
- Adding expense categories dynamically.  
- Adding participants with their expenses by category.  
- Specifying which categories each participant consumed.  
- Deducting participation fees evenly across categories.  
- Calculating each participant’s balance: how much they should pay or receive.  
- Displaying suggested money transfers to settle the event balance.  
- Optional transparent table view for data validation.  
- Saving events after calculation for future reference.  
- Editing existing events even after final calculation.  
- Editing participants at any point before final calculation.  
- Saving events as drafts and resuming later.

# 5. System Components

- Web-based User Interface.  
- Backend logic for expense calculation and balancing.  
- Data model representing events and participants.  
- Persistent storage mechanism for events (completed and drafts).

# 6. User Interface Expectations

The user interface will be a web page that receives inputs and displays a clear summary of who owes money to whom. It will optionally include a tabular breakdown for transparency and validation purposes. The UI will also allow users to:  
- View all events (completed or drafts).  
- Resume editing of draft events.  
- Edit participant data before finalizing an event.

# 7. Technology Stack

- Programming Language: Java or Python (final decision pending, preference is for ease of development).  
- Web Interface: Simple and minimal HTML-based form or display.  
- Backend: In-memory processing with basic persistent storage (file-based).

# 8. Assumptions

- Events are initially assumed to be one-time and handled per session.  
- Later sessions can resume previously saved events.  
- No user authentication is required.  
- The system will be used via a modern web browser.

# 9. Future Roadmap

- Export results to Excel or PDF.  
- Add user authentication for personalized access to events.  
- Enhance UI for mobile responsiveness.  
- Add recurring events support.  
- Enable cloud-based storage of events.