BillSplit App Design Document

Project Description

BillSplit is a streamlined expense sharing application designed to simplify one-to-one financial relationships (Phase 1), with plans to extend to group bill splitting for the final project (Phase 2). The application allows users to manage multiple friends but focuses on splitting individual bills between the user and a single friend at a time.

Home page will by default show a user's active friends with their current balances. An "Add Expense" button on the navigation bar will allow quick expense entry, while the "Friends" section displays all the user's friends with individual balance summaries. CRUD operations are available on expenses and friends.

CRUD Operations

Create:

- Users can add friends with customizable profiles
- Users can record expenses between themselves and one friend at a time
- Users can specify who paid initially for each expense

Read:

1. For friends, users can view all their friends with summary of current balances
2. For expenses, users can browse all expenses with a particular friend, sorted by date
3. For balances, users can see clear visual indicators for positive and negative balances

Update:

- Users can edit expense information including amount, description, date, and split allocation
- Users can modify friend information

Delete:

- Users can remove expenses they've recorded
- Users can delete friends from their list

User Personas

1. **Jordan (28, Social Networker)** Jordan maintains many individual friendships and needs to track separate expenses with multiple friends.

   "I need to keep financial relationships distinct and uncomplicated, and know exactly where each friendship stands financially."

2. **Alex (32, Precise Splitter)** Alex values financial clarity and prefers direct financial relationships.

"I want to maintain exact records of expenses with each friend and split different bills with different friends without mixing financial obligations."

3. **Sam (26, Apartment Sharer)** Sam shares an apartment with one other person and needs to track shared household expenses.

   "I need to track shared household expenses like rent, utilities, and groceries, and maintain a clear record of who paid for what to keep our financial relationship balanced."

User Stories

1. **Jordan's Story:** "As someone who maintains many individual friendships, I want to add each of my friends to the app individually, so I can track separate expenses with each of them. I often meet different friends for different activities - lunch with one, movies with another, and coffee with a third. I need to easily select which friend was involved in each transaction, record who paid initially, and see the current balance for that specific friendship. I prefer one-on-one activities with my friends and want to avoid the complexity of group expenses. I'd like a clean summary view that shows me all my friendship balances at a glance, so I know who I owe and who owes me without having to dig through complex group arrangements."

2. **Alex's Story:** "As someone who values financial precision, I want to record exactly what I spend with each friend and split bills either evenly or with custom amounts. For instance, when I go to dinner with Pat, I want to enter the total bill, specify who paid at the restaurant, and indicate how we're splitting it. If we split the main course evenly but I ordered an extra drink, I need to adjust the split accordingly. I want the app to automatically calculate and update our balance based on who paid initially and how we split the bill. I'd like to be able to edit expense details if I make a mistake, and to settle up individually with each friend without mixing financial obligations. Having a clear history of all transactions with each friend helps avoid disagreements and maintains financial clarity."

3. **Sam's Story:** "As someone sharing an apartment with one roommate, I need to track our household expenses consistently. We have recurring expenses like rent and utilities that alternate between us each month, as well as variable costs like groceries and household supplies. I want to quickly add these expenses, specify who actually paid the bill, and have the app update our balance automatically. Sometimes one of us pays for larger expenses, like our semi-annual renters insurance, and we need to split that over time. I'd like to see a chronological list of all our shared expenses, and be able to settle up periodically to keep our financial relationship balanced. This helps us avoid uncomfortable money conversations by having clear, indisputable records of who paid for what."

Data Persistence Architecture

The application uses MongoDB as the database backbone with two collections:

1. **Friends collection** - storing contact details and current balances
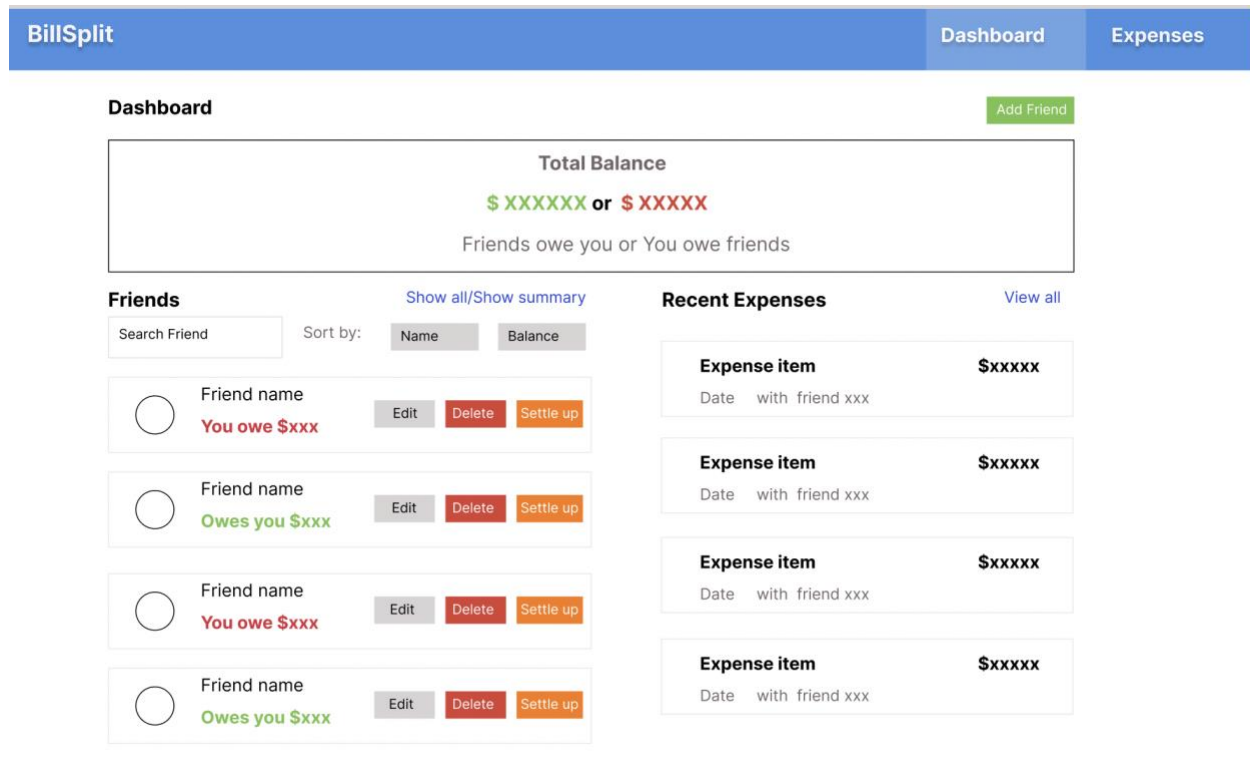2. **Expenses collection** - storing bill details, associated friend, and payment information

A RESTful API interface is implemented for database operations, ensuring reliable data persistence while maintaining an intuitive user experience.
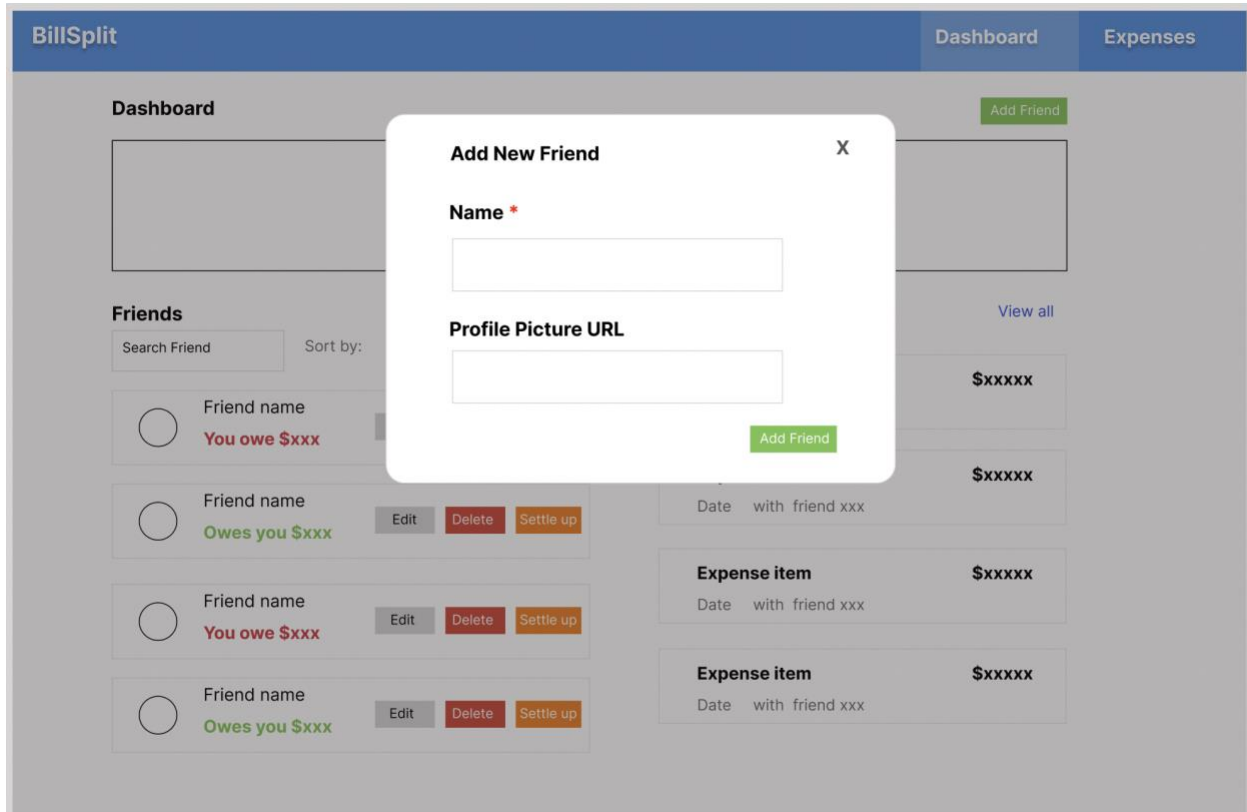
Design Mockups

Figma design doc link:

Homepage (Dashboard and Friends List)

Features displayed:

- Navigation bar with Dashboard page and Expenses page.
- Dashboard showing balance with color code for positive/negative and "who owes who"
- Add Friend" action buttons
- List of user's friends with current balance (color-coded for positive/negative), Options to edit or delete friend details and settle up balance with the friend
- Search bar to search friend and sort buttons to sort by name/ balance
- Recent expense items (switch to expenses page by clicking View all)

Homepage – Add New Friend Modal

Features displayed:

- Input new friend name
- Input new friend profile picture url
- Add friend button
- Close modal button

Expense Page:

Features displayed:

- Search bar to search expenses by description
- Add expense button to add new expense item
- Filter area to filter by friend, status (settled or unsettled), expense date from date and to date range
- Sort area to sort expense items by date, amount and description
- Pagination for sorted/filtered expense items
- Click on selected expense item to show details and conduct edit or delete actions

Expense Page - Add Expense Modal:

BillSplit   Dashboard   Expenses

Expenses

Search Expenses

Friend

All friends

From

yyyy/mm/dd   Reset Filters

Sort by: Date   Amount

Expense item $xxxxx
Date with friend xxx Paid by

Expense item $xxxxx
Date with friend xxx Paid by

Expense item $xxxxx
Date with friend xxx Paid by

<< First <

Add Expense

Add New Expense   X

Description *

Total Amount ($) *

Split with *

Select a friend

Date

Who paid *
○ You   ○ Friend name

Split Method *
○ Equally   ○ Custom

Your Share ($) *

Add expense

Features displayed:

- Select friend dropdown
- Amount entry field
- Description field
- Date picker
- "Paid by" selector (you/friend)
- Split method options (equal/custom)
- Add expense button
- Close modal button