

PROJECT ABSTRACT

Expense Splitter Android App

An Android app for splitting shared expenses across groups — trips, flats, office lunches — with equal, share-based and exact-amount splits, minimal-cash-flow settlement suggestions and per-member balances — built-to-order with source code, report, PPT and viva kit.

01. Title

Expense Splitter Android App

02. Introduction / Background

Shared expenses — a Goa trip with friends, monthly flat bills, office lunch clubs — create a familiar mess: one person pays, everyone owes fractions, and the settlement math at the end is argued over screenshots of UPI payments. Spreadsheets work but nobody maintains them on a trip. This project builds a mobile-first expense splitter: create a group, add members, log who paid what, choose how each expense splits (equally, by shares, or exact amounts), and let the app compute who owes whom with the minimum number of settlements. Balances update live as expenses are added, and the settlement plan tells each member exactly who to pay.

03. Problem Statement

Informal expense sharing relies on memory and chat messages, which leads to forgotten payments, disputed shares and end-of-trip arguments. Existing apps solve this but are closed products a student cannot dissect for a final-year project. This project reimplements the core — groups, flexible splits, live balances and optimal settlement — as an original Android build with a clean, explainable settlement algorithm suitable for viva discussion.

04. Objectives

- Implement group and member management with per-group expense ledgers.
- Support three split modes: equal, by shares (weights), and exact amounts.
- Maintain live per-member balances updated on every expense add/edit/delete.
- Compute a minimal settlement plan (minimum number of transfers) using a greedy creditor-debtor matching algorithm.
- Provide expense history, per-member totals and category-wise summaries.
- Record settlements and keep an auditable activity log per group.

05. Proposed Methodology

Each expense stores the payer, amount, split mode and per-member shares. Balances are derived: every member's net position is (total paid) – (total share owed). For settlement, the classic greedy approach is used — repeatedly match the largest creditor with the largest debtor, record the transfer, and reduce both — which yields the minimum number of transactions for the common cases and is easy to explain in a viva. Recording a settlement creates an offsetting entry so balances return toward zero. The activity log keeps every add, edit, delete and settlement with timestamps for auditability.

06. System Architecture / Working

Two layers: (1) Data layer — local database tables for groups, members, expenses, expense-shares and settlements; (2) Logic/UI layer — group list, group detail with balance header, add-expense flow with split-mode selector, settlement planner and activity feed. The working flow is: create group → add members → log expenses with payer and split mode → balances update live → open Settle to see the minimal transfer plan → record payments as they happen.

07. Hardware / Software Requirements

- Android phone (Android 8.0+) — no other hardware needed
- Kotlin or Java with Android SDK; SQLite (Room) for local storage
- Material Design components; optional chart library for summaries
- No internet required for core splitting functionality

08. Expected Outcomes

A working Android app where a 6-member trip group can log expenses in three split modes, see live balances, and follow a minimal settlement plan to zero out debts. All figures in the demo dataset are illustrative; the settlement algorithm's minimality claim covers the standard greedy-matching cases documented in the report.

09. Applications

- Trip and outing expense sharing among friends
- Flat/apartment rent and utility splitting
- Office lunch and outing groups
- Class or society event budgeting

10. Future Scope

- UPI deep-links for one-tap settlement payments
- Receipt photo attachment with OCR amount reading
- Multi-currency trips with exchange-rate handling
- Cloud sync so all members see live balances