Comprehensive Expense Analysis Project Report

Executive Summary

This project analyzes shared expenses within a group, focusing on contributions, spending patterns, and individual settlements. The primary goals were to identify expense trends, contributions by individuals, and provide fair settlement recommendations. Using a structured methodology, we analyzed monthly expenses by category and individuals, visualized the findings in Tableau, and derived actionable recommendations.

Key Findings:

1. Groceries and General Expenses dominate the spending categories.
2. Uneven contributions were observed among participants.
3. Some individuals still owe money to settle their balances.
4. Total expenses fluctuate significantly over time, with identifiable peaks.

Recommendations:

- Implement fair settlement systems using automated tools.
- Set budgets for high-spending categories like Groceries and General.
- Encourage equal participation in payments to avoid imbalances.

Introduction

Background

Shared expenses in a group setting often lead to challenges in tracking contributions and settlements. This project was initiated to analyze expenses, ensure fair distribution, and provide transparency through interactive dashboards.

Purpose

The project aims to:

1. Analyze spending trends over time.
2. Identify contributions by each group member.
3. Generate actionable insights and recommendations for expense management.

Scope

- **Data**: Expenses recorded by group members, categorized by type.
- **Tools**: Python for analysis, Tableau for visualization.

Significance

The project brings transparency to group finances, ensures fair settlements, and helps members manage future expenses efficiently.

Project Objectives

1. Track total monthly expenses and identify spending trends.
2. Categorize expenses (e.g., Groceries, Utilities) to find high-cost areas.
3. Analyze individual contributions and balances (paid vs. owed).
4. Provide payment recommendations for settling balances.
5. Visualize data for better understanding and decision-making.

Methodology

Data Collection

- Data was sourced from shared expense records in tools like Splitwise.
- The dataset included:
    - **Date**, **Category**, **Cost**, and participant-wise contributions.

Data Preparation

1. Cleaned and standardized data (e.g., handled missing values, converted types).
2. Extracted additional fields like `Month` from `Date`.

Tools Used

- **Python**: For data wrangling, cleaning, and analysis.
- **Tableau**: For data visualization.

Data Analysis Techniques

1. Aggregated total expenses by **Month** and **Category**.
2. Used `pandas` to calculate individual contributions and net balances.
3. Identified settlement amounts by comparing **Total Paid** vs. **Total Owes**.
4. Generated visualizations to uncover trends and contributions.

Results and Findings

1. **Total Expenses Over Time**:
    - Expenses showed clear peaks during specific months.
2. **Spending by Category**:
    - Groceries and General Expenses accounted for over 60% of total spending.
3. **Individual Contributions**:
    - Some participants (e.g., Nishant and Shruthi Gopagoni) contributed significantly more.
4. **Net Balances**:
    - Negative balances indicate participants who still owe money.
5. **Settlement Recommendations**:
    - Suggested payment amounts to settle debts among participants.

Analysis and Discussion

- The dominance of **Groceries** and **General Expenses** highlights the need for better budgeting.
- Uneven contributions can cause dissatisfaction among participants, emphasizing the importance of equal cost-sharing.
- Monthly peaks could be linked to shared activities like trips or events, requiring better planning.
- Payment imbalances were identified, and recommendations for settlement were provided to ensure fairness.

Conclusions

The project successfully achieved its objectives:

1. Tracked and visualized expenses over time.
2. Identified high-cost categories and individual contributions.
3. Provided actionable settlement recommendations.

By implementing the recommendations, the group can ensure fair cost-sharing, improved financial transparency, and better future planning.

Recommendations

1. Use automated tools like Splitwise for regular settlements.
2. Set monthly budgets to control spending in high-cost categories (e.g., Groceries).
3. Rotate responsibilities to ensure equal participation in payments.
4. Monitor monthly expenses using Tableau dashboards.
5. Plan ahead for activities that lead to spending peaks.

Project Timeline

Phase	Start Date	End Date	Key Milestones
Data Collection	Day 1	Day 2	Data compilation and cleaning
Data Analysis	Day 3	Day 6	Aggregation, balance analysis
Visualization	Day 7	Day 8	Dashboard creation in Tableau
Reporting and Insights	Day 9	Day 10	Final report preparation

Budget Summary

Expense Item	Budgeted Cost	Actual Cost	Variance
Data Tools (Python, Tableau)	Free	Free	$0.00
Personnel (Time Cost)	$500	$500	$0.00
Total	$500	$500	$0.00

Risk Assessment

Risk	Likelihood	Impact	Mitigation Strategy
Data Inconsistency	High	High	Data cleaning and validation
Uneven Contributions	Medium	High	Settlement recommendations
Visualization Challenges	Low	Medium	Use of Tableau best practices

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Team Composition

Team Member	Role	Responsibilities
Project Lead	Coordinator	Project planning and execution
Data Analyst	Sourabh R. Rodagi	Data wrangling and analysis
Visualization Specialist	Dashboard Development	Tableau visualization
Reviewer	Quality Assurance	Insight validation

Challenges and Lessons Learned

Challenges:

1. Managing incomplete and inconsistent data.
2. Ensuring fair settlement recommendations.

Lessons Learned:

1. Proper data validation is essential for accurate analysis.
2. Visual tools like Tableau make data insights easier to communicate.
3. Collaborative expense management requires regular monitoring.

Appendix

- Tableau Dashboard Screenshots
- Python Code Outputs
