Lab Report — Expense Calculator using Python

1. Aim

To design and implement a Python-based Expense Calculator that allows users to record daily expenses, categorize spending, view total expenditure, and delete incorrect entries. This system helps users manage their personal finances efficiently using a simple command-line interface.

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2. Software and Tools Used

- **Programming Language:** Python 3.x
- **Libraries Used:**
  - `os` – to verify and manage file existence
  - `json` – to store and load expense data in structured format
  - `datetime` – to automatically store the date for each expense entry
- **Text Editor / IDE:** Visual Studio Code / PyCharm / IDLE

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3. Problem Statement

Keeping track of daily expenses manually can lead to:

- Miscalculations,
- Loss of data,
- Poor awareness of financial habits.

To solve this issue, an automated expense tracking system is required.

This project enables users to:

- Add daily expense data
- View all expenses and total spending
- Categorize expenses for analysis
- Remove incorrect entries
- Save expense data permanently

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4. Algorithm / Methodology

1. **Start Program**
2. Check if a data file already exists
   → If yes, load existing expenses from file

3. Display a menu with the following options:
    - Add Expense
    - View Expenses + Total
    - View Total by Category
    - Delete Expense
    - Exit
4. **Add Expense**
    - Input name, category, amount
    - Automatically capture current date
    - Store data in list and update file
5. **View Expenses**
    - Display each expense with name, category, amount, and date
    - Calculate and show total expenditure
6. **View Total by Category**
    - Group all expenses category-wise
    - Display spending per category and grand total
7. **Delete Expense**
    - Show indexed list of expenses
    - Remove selected entry and update file
8. Continue displaying menu until Exit option is selected
9. **End Program**

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5. Features

Feature	Description
Add Expense	Saves name, category, amount & date
View All Expenses	Displays complete expense list with totals
Category-wise Summary	Shows spending patterns by category
Delete Expense	Removes incorrect or unwanted entries
Data Persistence	Stores data permanently using files

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6. Sample Output (Narrative)

- User enters: Coffee → Category: Food → Amount: ₹50
- **View Expenses** shows:

  ```
  1. Coffee | Food | 50 | 2025-11-28
  Total = ₹50
  ```

- **View Total by Category**:

  ```
  Food: ₹50
  Grand Total: ₹50
  ```

- **Delete Expense** removes entry and updates totals instantly.

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7. Observations

- The program accurately stores and retrieves transaction history.
- Easy categorization gives better financial insights.
- File handling makes long-term usage possible.
- Deleting any record updates both data and summary automatically.

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8. Conclusion

The Expense Calculator successfully demonstrates:

- Basic Python programming concepts
- File handling and data persistence using JSON
- Logical menu-driven user interaction
- Real-life usefulness for personal financial management

The project can be further improved by adding:

- Graphical User Interface (GUI)
- Search and filter options
- Export to Excel or PDF
- Mobile or web app integration

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9. Future Scope

To enhance usability and visualization:

- Add charts for spending trends
- Include authentication for multiple users
- Incorporate budget limit alerts
- Use a database for scalable storage

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10. Result

The program executed successfully and met all the defined objectives.
It provides a reliable and user-friendly way to track and analyze expenses.
