



National University
Of Computer and Emerging Sciences

Assignment 2

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SECTION – BCS(4A)

Subject – Database Systems

Expense Tracker System

1. Introduction

Purpose

The Expense Tracker System is a desktop application designed to help users manage their personal finances by tracking income and expenses. It provides:

- ✓ **Transaction logging** (expenses & income)
- ✓ **Data visualization** (charts for spending trends)
- ✓ **Excel export** (for further analysis)
- ✓ **User authentication** (secure login/signup)

Technologies Used

- **Frontend:** Tkinter (Python GUI)
- **Backend:** SQLite (Database)
- **Data Analysis:** Pandas (Excel export), Matplotlib (Charts)

2. System Functionality

2.1 User Authentication

Login

- Users enter username and password.
- System checks credentials against the User table in SQLite.
- Successful login opens the main application.

Signup

- New users provide a unique username and password.
- Data is stored in the User table.
- Duplicate usernames are rejected.

2.2 Managing Transactions

Add Expense

- Users input:
 - **Amount** (e.g., \$50)
 - **Category** (e.g., Food, Transport)
 - **Description** (optional notes)
 - **Date** (defaults to current date)
- Data is stored in the Expenses table.

Add Income

- Users input:
 - **Amount** (e.g., \$1000)
 - **Source** (e.g., Salary, Freelance)
 - **Date** (defaults to current date)
- Data is stored in the Income table.

2.3 Viewing Transactions

- Users can view all transactions in a scrollable text box.
- Transactions are categorized into:
 - **Expenses** (Amount, Category, Description, Date)
 - **Income** (Amount, Source, Date)

2.4 Data Visualization

- Users can generate bar charts for:
 - **Expense Breakdown** (by category)
 - **Income Breakdown** (by source)
- Uses Matplotlib for graphical representation.

2.5 Excel Export

- Users can export transaction history to an Excel file (username_transaction_history.xlsx).
- File contains two sheets:
 - **Expenses** (Category, Amount, Description, Date)
 - **Income** (Source, Amount, Date)

3. Database Structure

The system uses SQLite with three tables:

3.1 User Table

Column	Type	Description
id	INTEGER	Primary Key (Auto-increment)
username	TEXT	Unique username
password	TEXT	User password (stored in plaintext for simplicity)

3.2 Expenses Table

Column	Type	Description
id	INTEGER	Primary Key
user_id	INTEGER	Foreign Key (Links to User.id)
amount	REAL	Expense amount
category	TEXT	Expense category (e.g., Food, Rent)
description	TEXT	Optional notes
date	TEXT	Date of expense (YYYY-MM-DD)

3.3 Income Table

Column	Type	Description
id	INTEGER	Primary Key
user_id	INTEGER	Foreign Key (Links to User.id)
amount	REAL	Income amount
source	TEXT	Income source (e.g., Salary, Bonus)
date	TEXT	Date of income (YYYY-MM-DD)

4. System Workflow

4.1 User Registration

1. User enters username and password in the signup form.
2. System checks if the username already exists.
3. If valid, the credentials are stored in the User table.

4.2 User Login

1. User enters credentials.
2. System verifies against the User table.
3. If correct, the main application opens.

4.3 Adding Transactions

1. User selects Expense or Income.
2. Fills in details (amount, category/source, date).
3. Data is saved to the respective table (Expenses or Income).

4.4 Viewing History

1. User clicks **View Full History**.
2. System fetches data from SQLite and displays it in a text box.

4.5 Generating Charts

1. User clicks **Visualize Data**.
2. System aggregates expenses/income by category/source.
3. Displays dual bar charts using Matplotlib.

4.6 Exporting to Excel

1. User clicks Save to Excel.
2. System fetches transactions and structures them into a Pandas DataFrame.
3. Exports to an Excel file with two sheets (Expenses and Income).

5. Security Considerations

⚠ **Current Limitation:** Passwords are stored in plaintext (not secure).

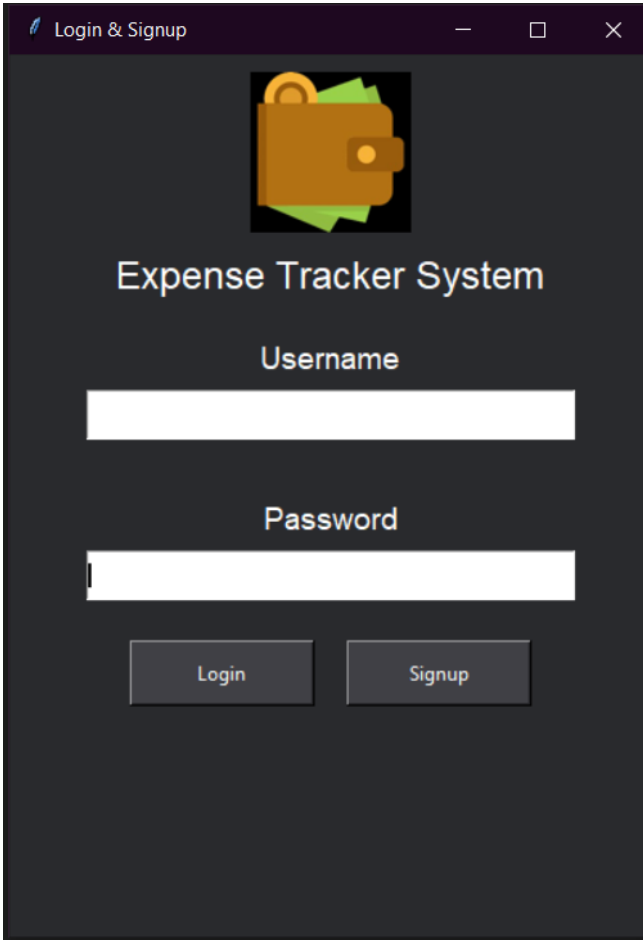
6. Conclusion

The **Expense Tracker System** provides a **user-friendly** way to:

- ✓ Track daily expenses & income
- ✓ Visualize spending habits
- ✓ Export data for further analysis

Appendix: Screenshots

◆ Login/Signup Screen



◆ Main Application (Expense/Income Entry) && Transaction History View

Expense Tracker

Welcome, Taha!

Expense Amount:

Category:

Description:

Date (YYYY-MM-DD):

+ Add Expense

Income Amount:

Source:

Date (YYYY-MM-DD):

+ Add Income

Logout

Transaction History

===== Expenses =====

Amount: \$678.00, Category: fgh, Description: fgh, Date: 5666-99-78

Amount: \$6000.00, Category: parents, Description: dk, Date: 2025-07-90

Amount: \$900.00, Category: drinks, Description: pa ta nhi, Date: 2025-09-21

Amount: \$900.00, Category: drinks, Description: pa ta nhi, Date: 2025-09-21

Amount: \$900.00, Category: drinks, Description: pa ta nhi, Date: 2025-09-21

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Amount: \$900.00, Category: drinks, Description: pa ta nhi, Date: 2025-09-21

===== Income =====

Amount: \$500.00, Source: parents, Date: 2025-09-21

Amount: \$500.00, Source: parents, Date: 2025-09-21

Amount: \$500.00, Source: parents, Date: 2025-09-21

Amount: \$500.00, Source: parents, Date: 2025-09-21

Amount: \$500.00, Source: parents, Date: 2025-09-21

Amount: \$500.00, Source: parents, Date: 2025-09-21

View Full History

Visualize Data

Save to Excel

◆ Data Visualization Charts

