SYNOPSIS

on

Expense Tracker

AFid: AF04990749, AF04991794

Batch Code: ANP-D2406

Course Code: ITPR

Guided By: – Aunj kumar

Created By: Teeksha & Drishty

Table Of Contents

Introduction

The Expense Tracker System is a command-line Java application designed to help users systematically record and monitor their financial transactions. It provides a structured way to capture income and expenses so that users can clearly understand where their money is being spent.

The application uses a MySQL database as the backend to store all financial data in a secure and organized manner. By combining Core Java with JDBC and basic DBMS concepts, the system demonstrates how a simple console-based interface can be integrated with a relational database to offer reliable storage, fast retrieval, and consistent reporting of financial information.

Objectives

- To maintain all user expenses in a centralized digital system instead of manual records.
- To organize expenses based on categories such as Food, Travel, Rent, Bills, Shopping, and Others.
- To provide monthly and custom-period summaries, including total expenses and remaining budget.
- To offer a simple, menu-driven command-line interface for fast data entry and retrieval.
- To demonstrate practical implementation of Core Java, JDBC, and fundamental DBMS concepts.

Project Category

- Software Application / Console-Based Application
- Technology: Java (Core) + MySQL Database
- Type: Command Line Interface (CLI) Project
- Domain: Personal Finance Management

This project falls under the category of Application Software / Database Management System.
It focuses on applying core Java programming and relational database principles to solve a real-life problem of personal finance and expense tracking.

Analysis

Modules and Description

- The Expense Tracker system consists of several key modules, each designed to manage specific aspects of personal finance tracking:
- User Module: Handles user registration, login, and profile management, ensuring secure access and personalized experience.
- Expense Module: Allows users to add, view, update, and delete expense entries, categorized by type and payment method.
- Category Module: Maintains a list of expense categories (e.g., Food, Travel, Rent) for organized tracking.
- Income Module: Records income sources and amounts, supporting savings and net balance calculations.
- Budget Module: Enables users to set monthly or category-wise spending limits for better financial control.
- Reminder/Alert Module: Generates console-based alerts when expenses approach or exceed budget limits.
- Report Module: Provides detailed reports on income, expenses, and savings, supporting informed financial decisions.
- Payment Mode Module: Stores various payment methods (Cash, UPI, Card) for accurate expense categorization.
- These modules work together to provide a comprehensive, secure, and user-friendly expense tracking solution.

Database Design:

User Table :

Field Name	Data Type	Description
UserID	INT (PK)	Unique user ID
Name	VARCHAR(100)	Full name of user
Email	VARCHAR(100)	User email
Password	VARCHAR(50)	Encrypted password

Categories Table

Field Name	Data Type	Description
CategoryID	INT (PK)	Unique category ID
CategoryName	VARCHAR(100)	Name of the category

Expenses Table

Field Name	Data Type	Description
ExpenseID	INT (PK)	Unique expense entry ID
UserID	INT (FK)	References Users table
CategoryID	INT (FK)	References Categories table
Amount	DOUBLE	Expense amount
Date	DATE	Expense date
Description	VARCHAR(255)	Expense details

Payment Table

Attribute Name	Data Type	Constraints	Description
payment_mode_id	INT	PK, AUTO_INCREMENT	Unique identifier for payment mode
mode_name	VARCHAR(50)	NOT NULL, UNIQUE	Payment method (Cash, UPI, Card)
details	VARCHAR(200)	---------	Additional details

Income Table

Attribute Name	Data Type	Constraints	Description
income_id	INT	PK, AUTO_INCREMENT	Unique identifier for each income record
user_id	INT	FK to users(user_id)	Reference to the user
source	VARCHAR(100)	NOT NULL	Income source (Salary, Bonus, etc.)
amount	DECIMAL(10,2)	NOT NULL	Income amount
date	DATE	NOT NULL	Date of income
notes	VARCHAR(255)	----------	Additional notes

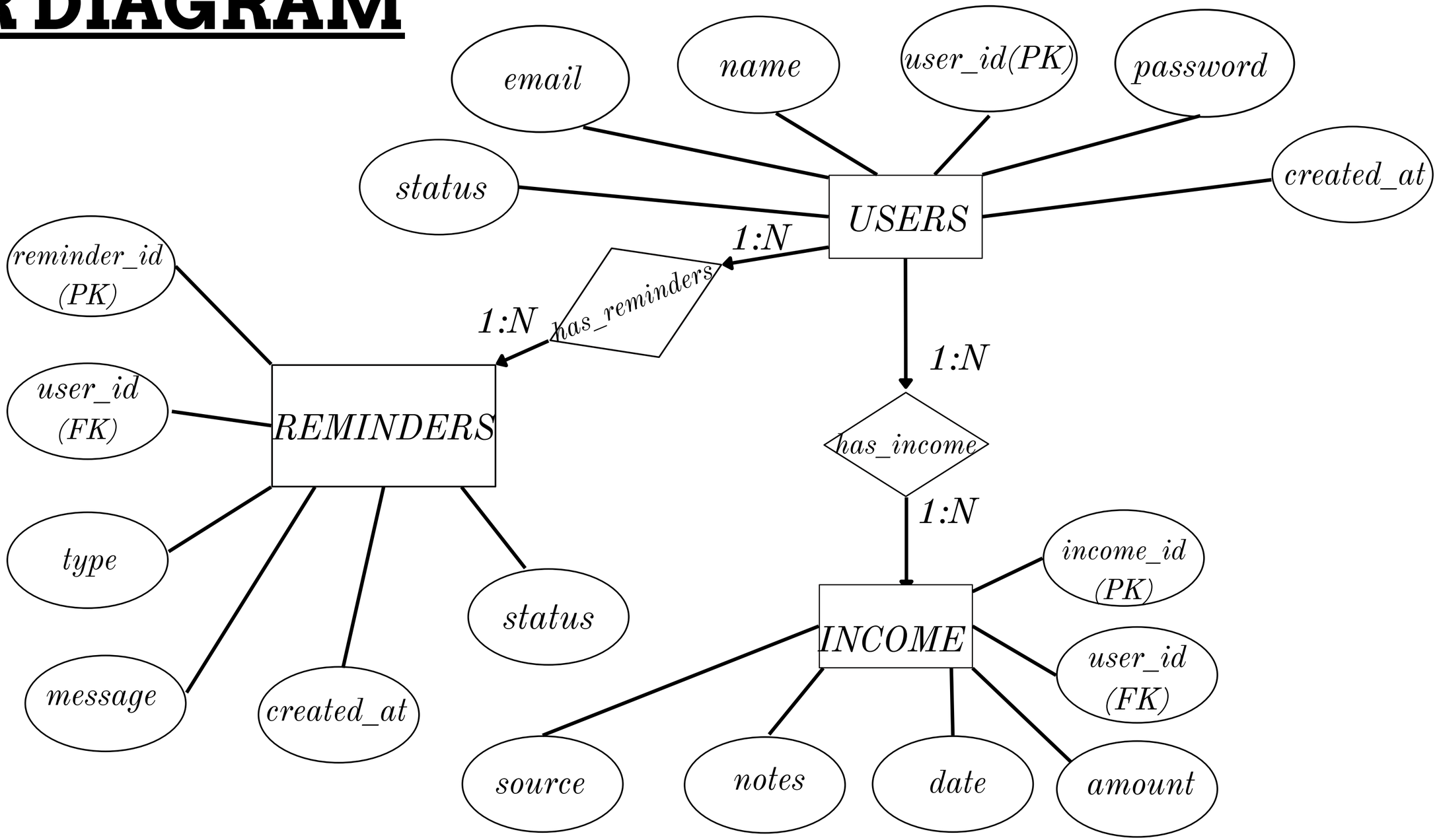
Budget Table

Attribute Name	Data Type	Constraints	Description
budget_id	INT	PK, AUTO_INCREMENT	Unique identifier for budget
user_id	INT	FK to users(user_id)	Reference to user
month	TINYINT	NOT NULL	Month (1 to 12)
year	INT	NOT NULL	Year
category_id	INT	FK to categories(category_id), optional	Budget category (optional)
limit_amount	DECIMAL(10,2)	NOT NULL	Budget limit amount

Reminder Table

Attribute Name	Data Type	Constraints	Description
reminder_id	INT	PK, AUTO_INCREMENT	Unique identifier for reminder
user_id	INT	FK to users(user_id)	Reference to user
type	VARCHAR(50)	NOT NULL	Type of reminder (e.g., BUDGET_ALERT)
message	VARCHAR(255)	NOT NULL	Reminder message
created_at	DATETIME	DEFAULT CURRENT_TIMESTAMP	Reminder creation timestamp
status	VARCHAR(20)	DEFAULT 'PENDING'	Reminder status

ER DIAGRAM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name
user_id(PK)
password
status
created_at
USERS
1:N
has_reminders
1:N
reminder_id (PK)
user_id (FK)
REMINDERS
type
message
created_at
status
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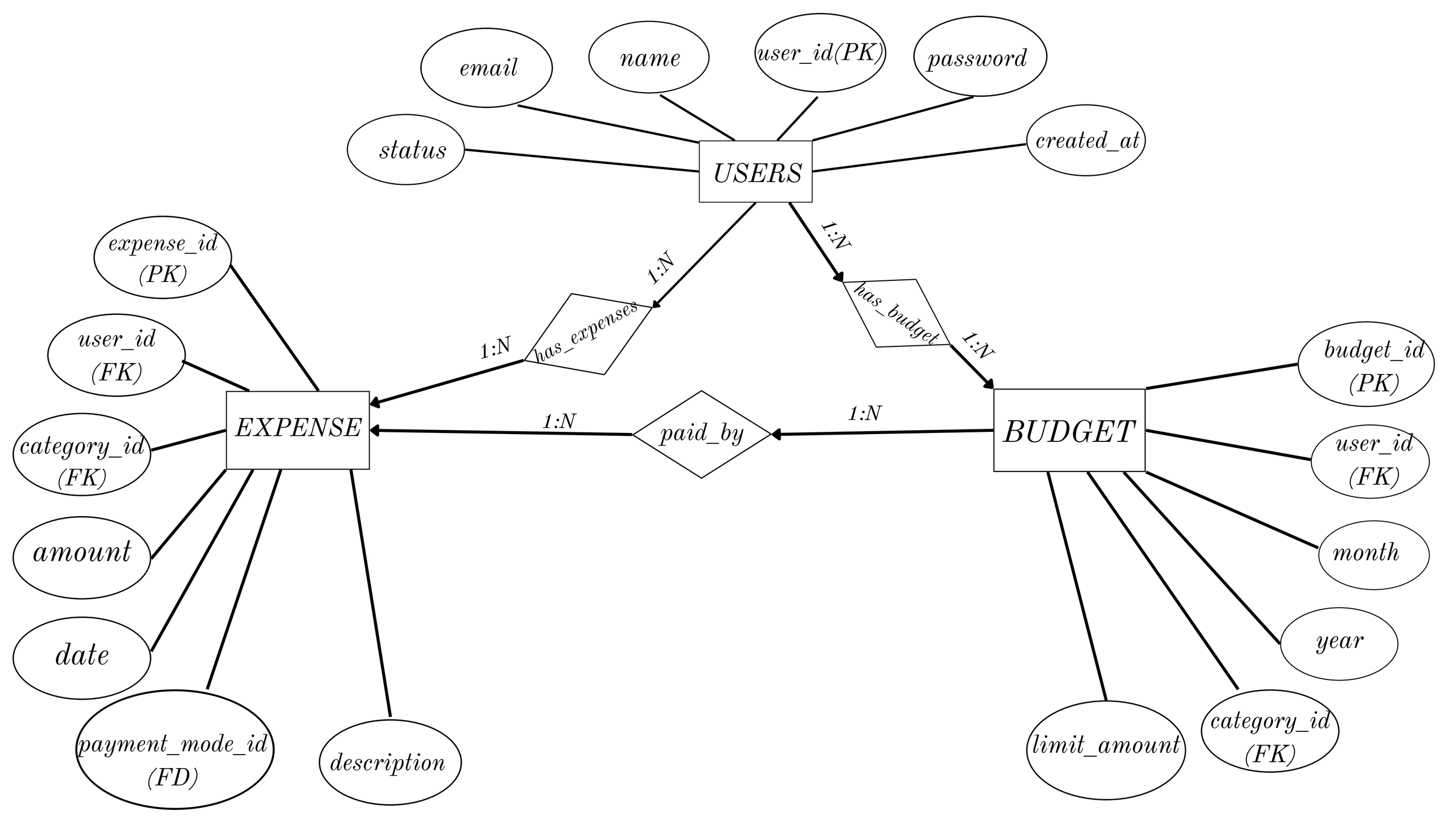
income_id (PK)
INCOME
user_id (FK)
source
notes
date
amount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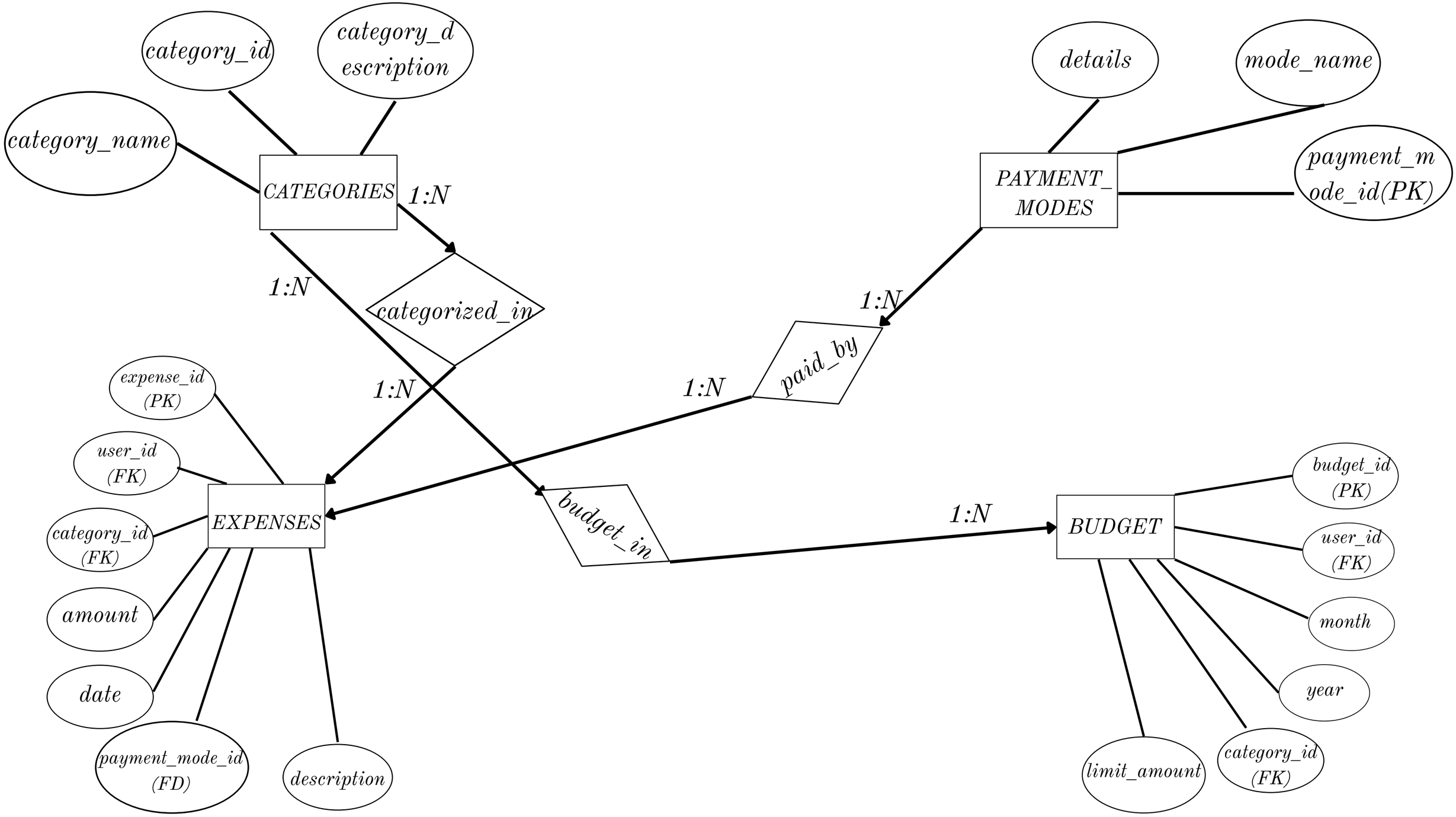
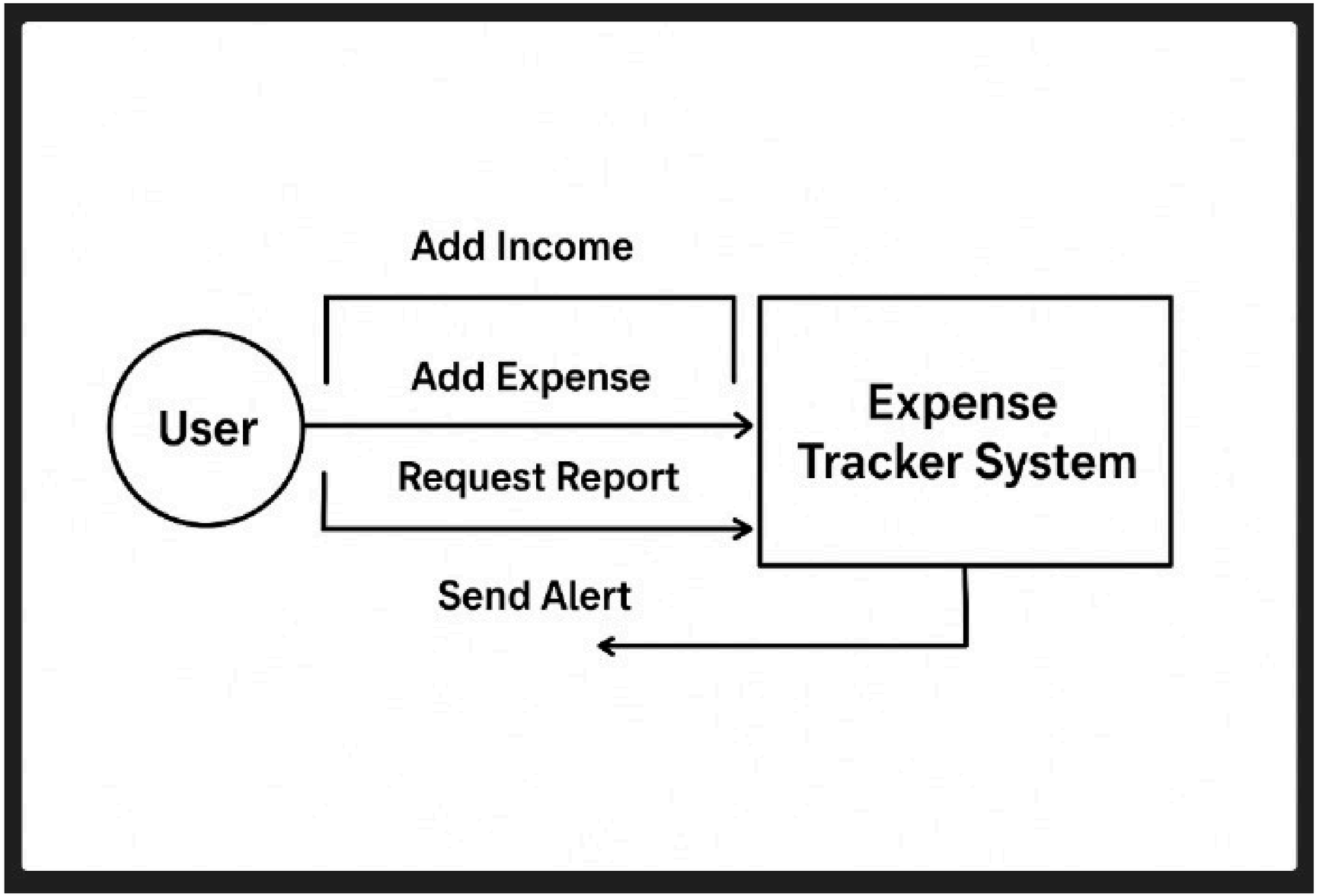
name
user_id(PK)
password
status
USERS
created_at
expense_id (PK)
1:N
has_expenses
1:N
1:N
has_budget
1:N
budget_id (PK)
user_id (FK)
EXPENSE
1:N
paid_by
1:N
BUDGET
category_id (FK)
amount
user_id (FK)
month
date
year
payment_mode_id (FD)
description
limit_amount
category_id (FK)

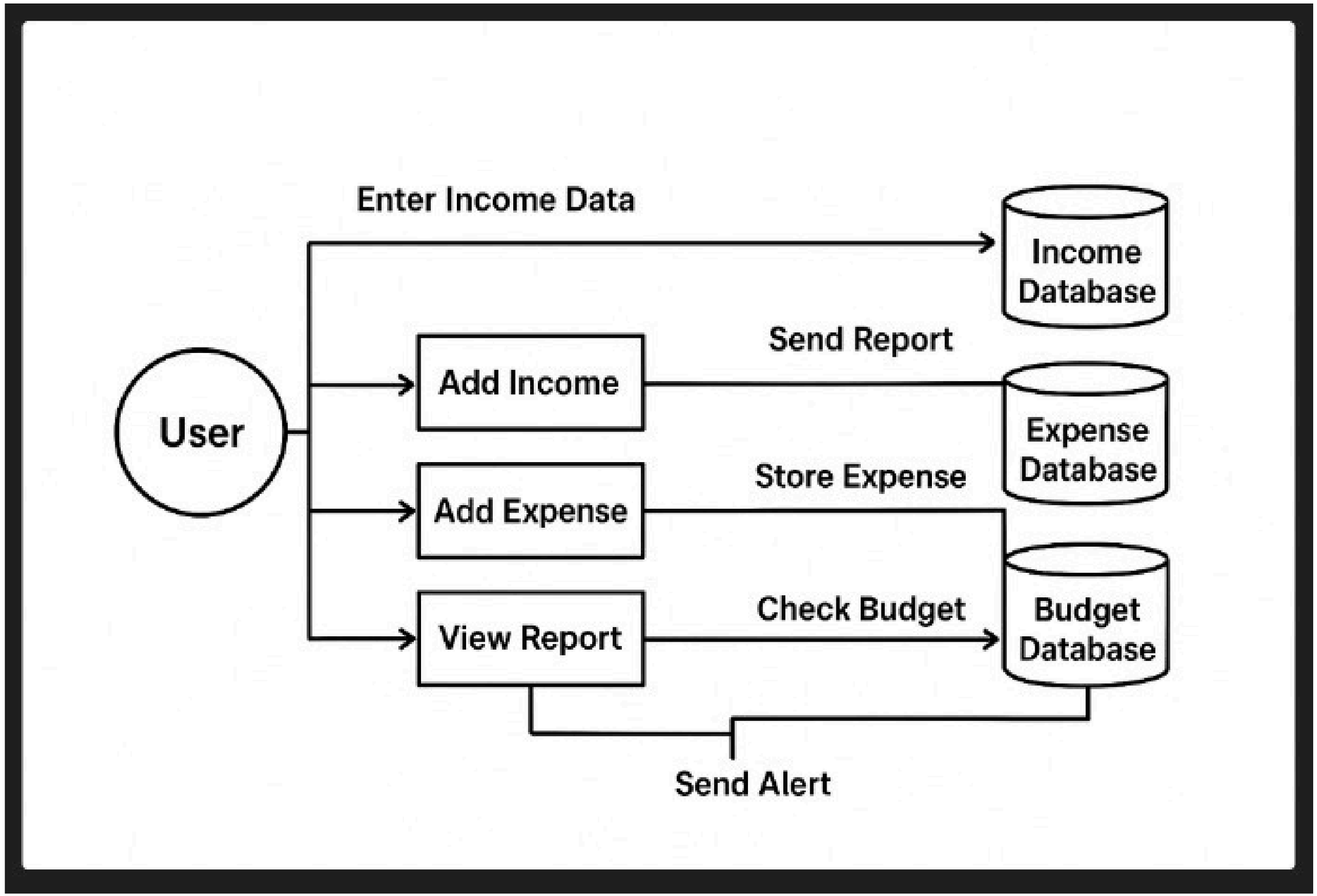

category_id
category_description
category_name
CATEGORIES
1:N
categorized_in
1:N
details
mode_name
payment_mode_id(PK)
PAYMENT_MODES
1:N
paid_by
1:N
expense_id (PK)
user_id (FK)
category_id (FK)
amount
date
payment_mode_id (FD)
description
EXPENSES
1:N
budget_in
1:N
BUDGET
budget_id (PK)
user_id (FK)
month
year
category_id (FK)
limit_amount

Data Flow Diagram

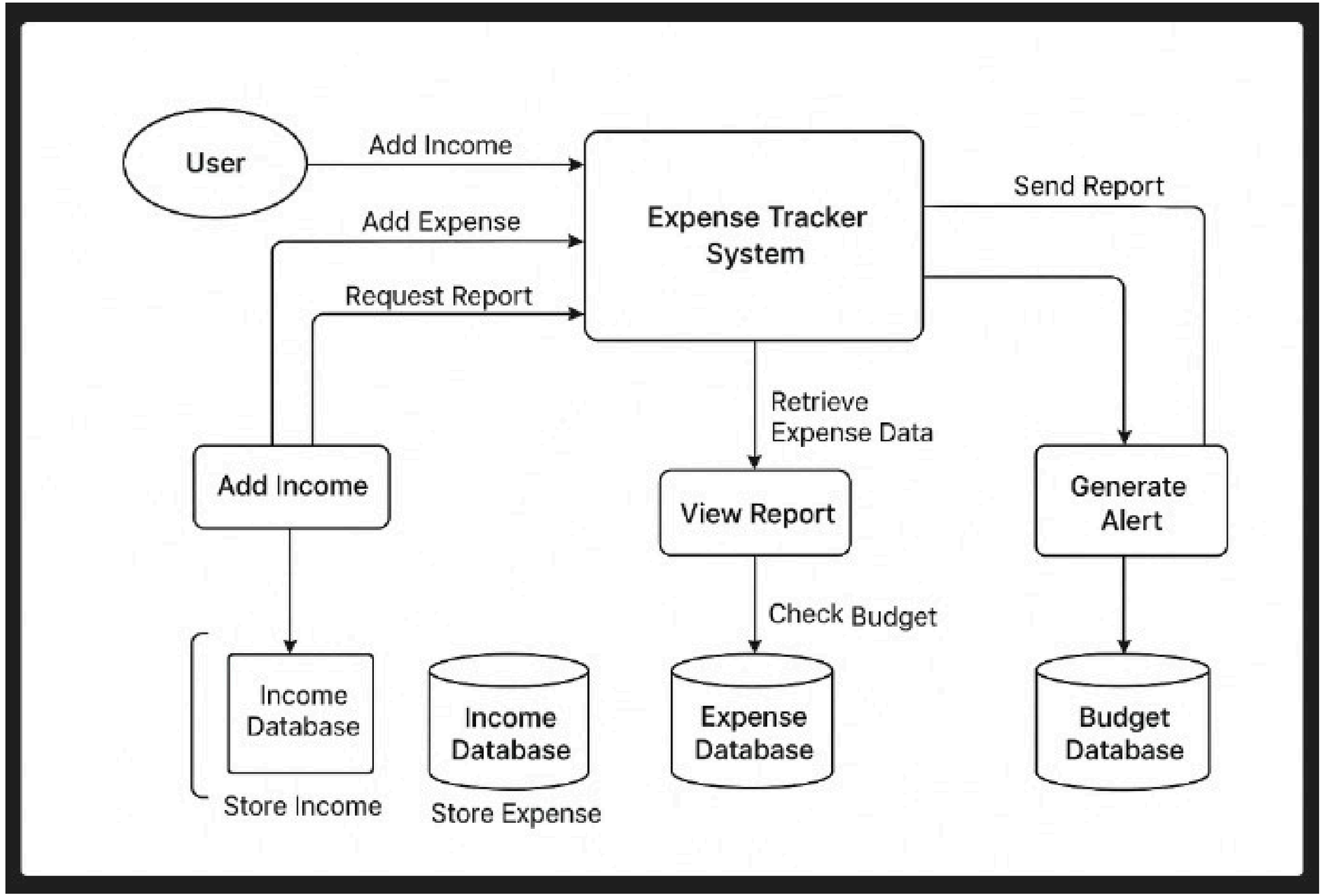
Level 0



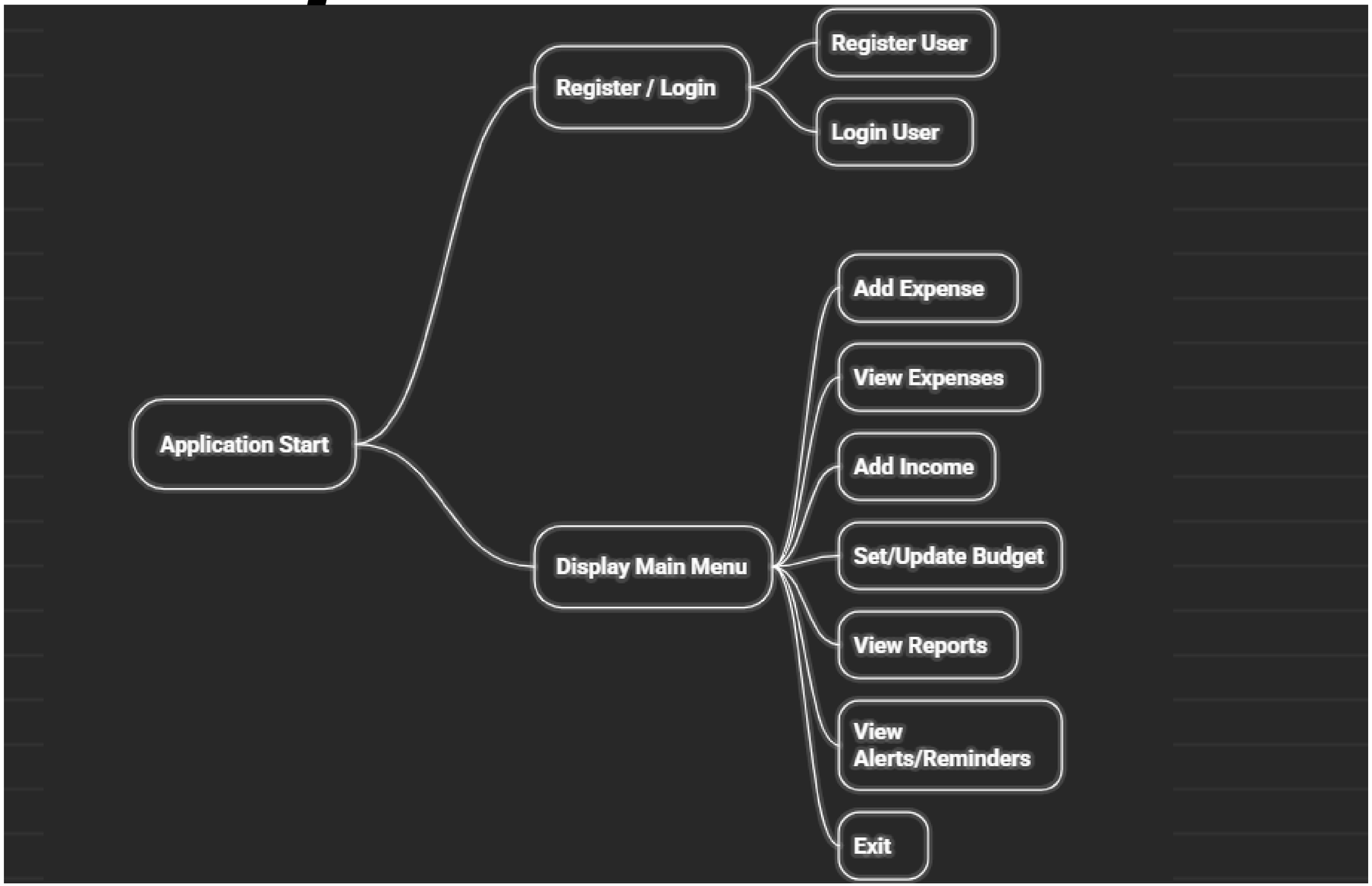
Level 1


Enter Income Data
Income Database
Send Report
User
Add Income
Expense Database
Store Expense
Add Expense
Budget Database
Check Budget
View Report
Send Alert

Level 2


User
Add Income
Add Expense
Request Report
Expense Tracker System
Send Report
Retrieve Expense Data
Add Income
View Report
Generate Alert
Check Budget
Income Database
Store Income
Income Database
Store Expense
Expense Database
Budget Database

Complete Structure



Platform Used

Hardware Requirements:

- Intel i3 or above
- RAM 4GB or above
- 500MB storage

Software Requirements:

- Windows
- MySQL
- Java
- Eclipse

Future Scope

- Adding graphical user interface(GUI)
- Mobile application integration.
- Cloud backup.
- AI-based spending recommendations.
- Advanced dashboard analytics.

Bibliography

- Online documentation
- developer tutorials
- Class Notes
- AI-assisted development tools