

ExpenseManager

An application to track your transactions

**A PROJECT REPORT SUBMITTED IN PARTIAL FULFILMENT OF
REQUIREMENT
FOR THE AWARD OF THE DEGREE**

**MASTER OF COMPUTER APPLICATIONS (MCA)
OF
MAHATMA GANDHI UNIVERSITY, KOTTAYAM
BY**

NITHIN GEORGE
Reg No: 22PMC140



**MARIAN COLLEGE
KUTTIKANAM**

(AUTONOMOUS)

MAKING COMPLETE

Marian College Kuttikkanam Autonomous

Peermade, Kerala – 685 531

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Under the guidance of

Ms. Kochumol Abraham
Assistant Professor
PG Department of Computer Applications
Marian College Kuttikkanam Autonomous



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PG DEPARTMENT OF COMPUTER APPLICATIONS
Marian College Kuttikkanam Autonomous

MAHATMA GANDHI UNIVERSITY, KOTTAYAM
KUTTIKKANAM – 685 531, KERALA.

CERTIFICATE

This is to certify that the project work entitled

ExpenseManager

is a bonafede record of work done by

NITHIN GEORGE

Reg. No.22PMC140

In partial fulfilment of the requirements for the award of Degree of

MASTER OF COMPUTER APPLICATIONS [MCA]

During the academic year 2023-2024

External Examiner

External Examiner

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NITHIN GEORGE

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Abstract

Managing personal expenses is an essential aspect of maintaining financial stability and achieving financial goals. With the increasing complexity of modern lifestyles, individuals often struggle to effectively track and control their expenses. To address this challenge, I present an Expense Manager application, designed to provide users with a comprehensive tool for efficient expense management.

The Expense Manager application leverages advanced technologies and user-friendly interfaces to simplify the process of tracking and categorizing expenses. Through intuitive features, users can effortlessly record their expenses and monitor their financial health in real-time.

The application categorizes expenses based on user-defined categories, allowing users to gain insights into their spending patterns and identify areas for improvement.

Furthermore, the Expense Manager application offers insightful visualizations and reports, presenting users with clear and concise summaries of their financial data. These visual representations enable users to analyse their expenses, identify trends, and make informed financial decisions.

Data security and privacy are of utmost importance to us. The Expense Manager application employs robust encryption and secure protocols to protect user information, ensuring that financial data remains confidential and secure.

In summary, the Expense Manager application is a powerful and user-friendly tool designed to simplify and enhance personal expense management. By providing budgeting features, and insightful analytics, the application empowers users to gain control over their finances, achieve their financial goals, and improve their overall financial well-being.

Project Requirements

1. Record and categorize expenses:

This requirement provides the ability to add, edit, and view expenses with user-defined categorizations.

2. Budget Tracking:

This requirement provides the option to view budgets spend for various categories.

3. Calendar view:

This requirement lets you visualize a Calendar with daily expenses and incomes.

4. Export options of the expense:

This requirement lets expenses to be exported to various export options to CSV, Excel, Pdf etc.

5. Export options of the income:

This requirement lets incomes to be exported to various export options to CSV, Excel, Pdf etc.

6. Profile management:

This requirement lets you manage your profile details.

7. Mobile view:

This requirement must let you view the site in mobile such that it is build with a responsive design.

8. Admin dashboard:

This requirement lets you view the Django admin site in a much more visually appealing one from the traditional one.

9. Set a custom Currency:

This requirement lets users set a custom currency according to your preference.

Features and Highlights

1. Secure user signup and login functionality:

This feature lets users signup and login with the right credentials such that no fraudulent users are let access. And also, both username and email are checked with the database to ensure no duplicate data are present during user signup.

2. Add, edit and delete income and expenses:

This feature lets users add, edit and delete income and expenses to their application.

3. Export option available for both income and expenses:

This feature lets users export both income and expenses as pdf, CSV or excel formats.

4. Profile management:

This feature lets users update their username and password whenever required. The email cannot be edited once after signup.

5. Graphical representation of Income and expenses:

This feature lets users view both the summary of income and expenses as bar graphs such that they are distinguished by user-defined categories.

6. A calendar view for income and expenses:

This feature lets users see both income and expenses in a calendar as a small summary on date basis.

7. Responsive design:

This feature ensures that the application is developed in a responsive manner such that it could be added as a mobile application shortcut such that it could be used like the traditional mobile apps as per requirement.

Technical Aspects

Django Libraries & Third-party APIs

- **Django-jazzmin:**

It provides the ability to customize Django admin interface with a modern and responsive design with additional features and customization options.

- **CSS – Bootstrap 5:**

It is a popular CSS framework that provides a collection of pre-built responsive components and utilities which simplifies the process of designing and styling web pages, making them visually appealing and mobile-friendly. It can be used to create a consistent and professional looking user interface.

- **PDF generation – ReportLab:**

This is a python library used for generating PDF documents programmatically and it provides a wide range of features for creating dynamic and customized PDFs.

- **Visualisation – ChartJs:**

It is a JavaScript library used for creating interactive and visually appealing charts and graphs which offers various chart types like bar, line and pie charts.

- **CSV:**

It is a python library that lets you export data as CSV format.

- **XLWT:**

It is a python library that lets you export data as excel format.

- **FullCalendar Js:**

It is a JavaScript library that lets users represent data within a calendar in the form of events. Moreover, it provides the ability to utilize various dynamic and customizable features.

Architecture of the Project

The architecture of the Expense Manager project follows a layered and modular design, incorporating key components and their interactions to provide an efficient expense management system.

1. Presentation Layer:

- **User Interface:** This component handles the user interaction and provides a user-friendly interface for accessing the application.
- **Views and Forms:** It comprises the screens and forms that allow users to input expenses, set budgets, and view reports.

2. Application Layer:

- **ExpenseMain Module:** This module acts as the core functionality of the system, handling expense recording, categorization, and budget visualisations.
- **ExpenseManager:** This module handles the main urls that manages the application.

3. Data Layer:

- **Database:** It includes a relational database management system called sqlite to store user data, expense records, budgets, and other relevant information.
- **Object-Relational Mapping (ORM):** An ORM tool is used to map database entities to application objects, facilitating data retrieval and manipulation.

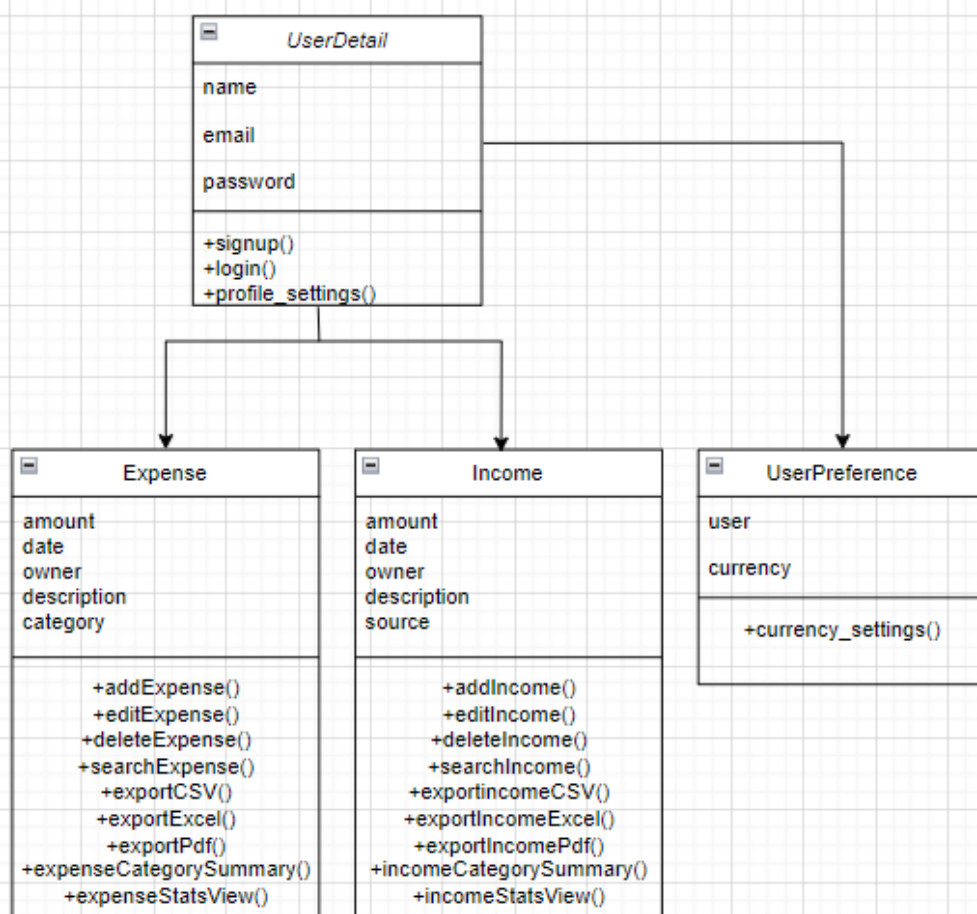
4. Integration Layer:

- **External APIs:** This component integrates with external systems, such as FullCalendar APIs or Chart Js APIs, to visualize the transaction data automatically.

5. Reporting and Analytics:

- **Reporting Engine:** This component generates reports and visualizations based on user preferences and selected data parameters.

Database (Class Diagram) of the Project

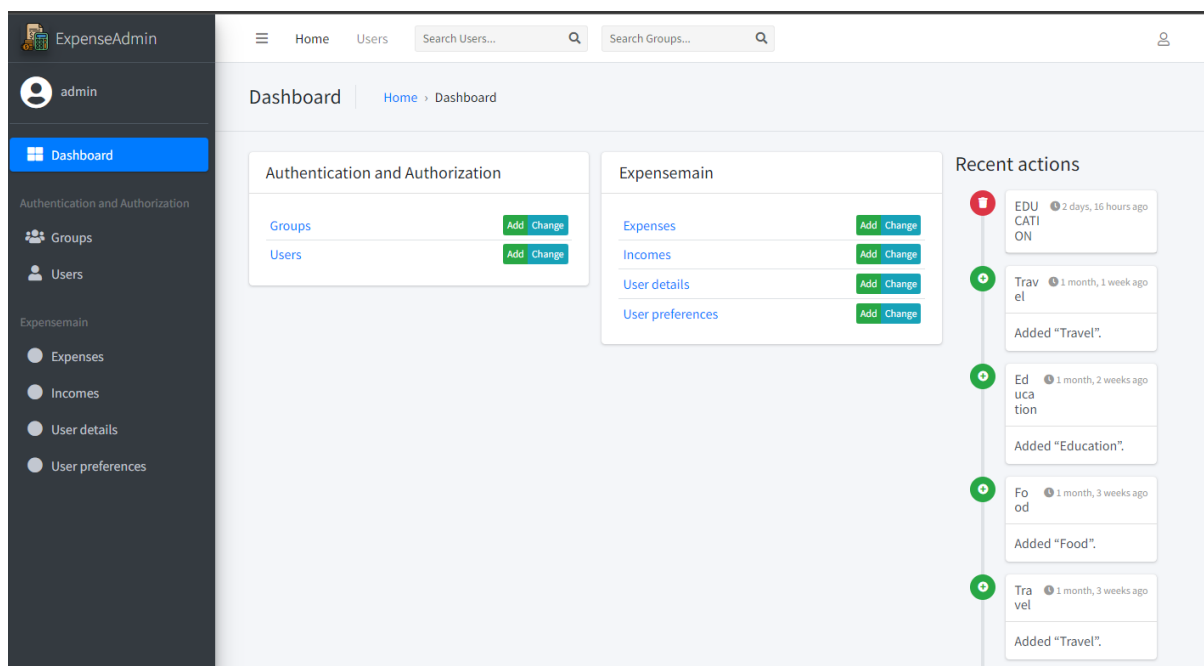
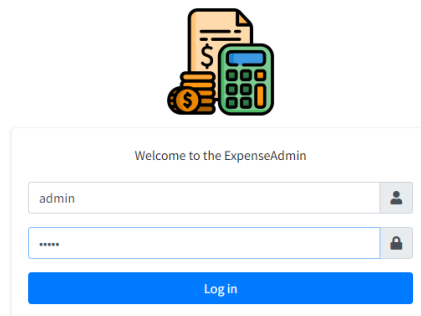


Challenges faced during development

- My major concern was implementing the calendar view to the project such that the total income and expense summary is returned for each day. I had to figure out a way to bring the data from database to the FullCalendar API. Even though I had previous experience of implementing FullCalendar on my project while I was working, I had to brush up all the concepts again. After quite some research, I finally managed to pass data from the database as Json format and then render them as events on the Calendar. I had to make use of ChatGPT and the official documentation of FullCalendar Js.
- Secondly, I was new to implementing ChartJs and after hours of research at ChatGPT and the official documentation of ChartJs, I finally managed to show output of incomes and expenses based on category as charts.

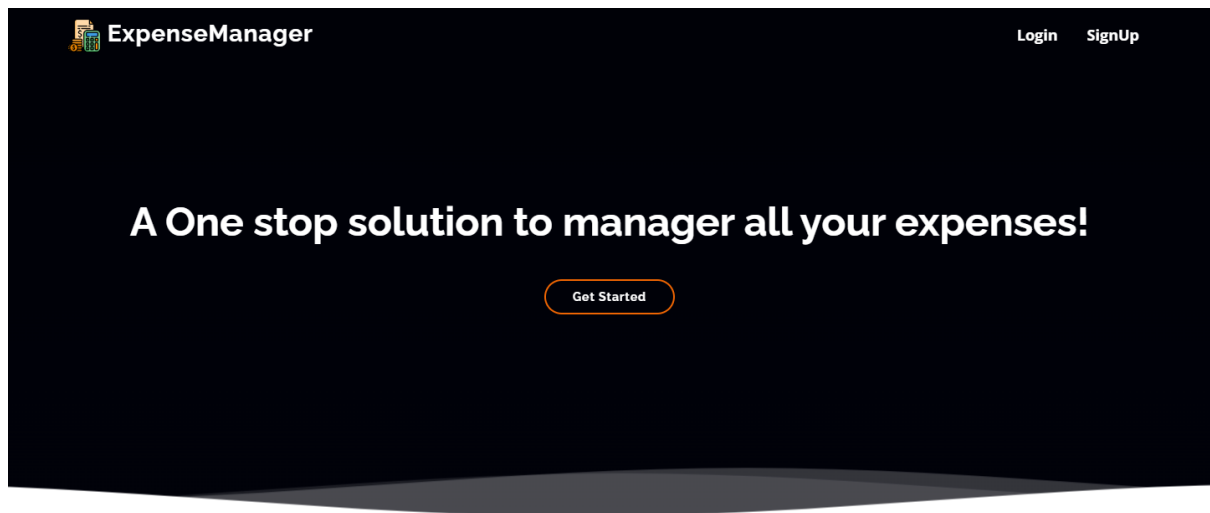
Screenshots

- Admin panel



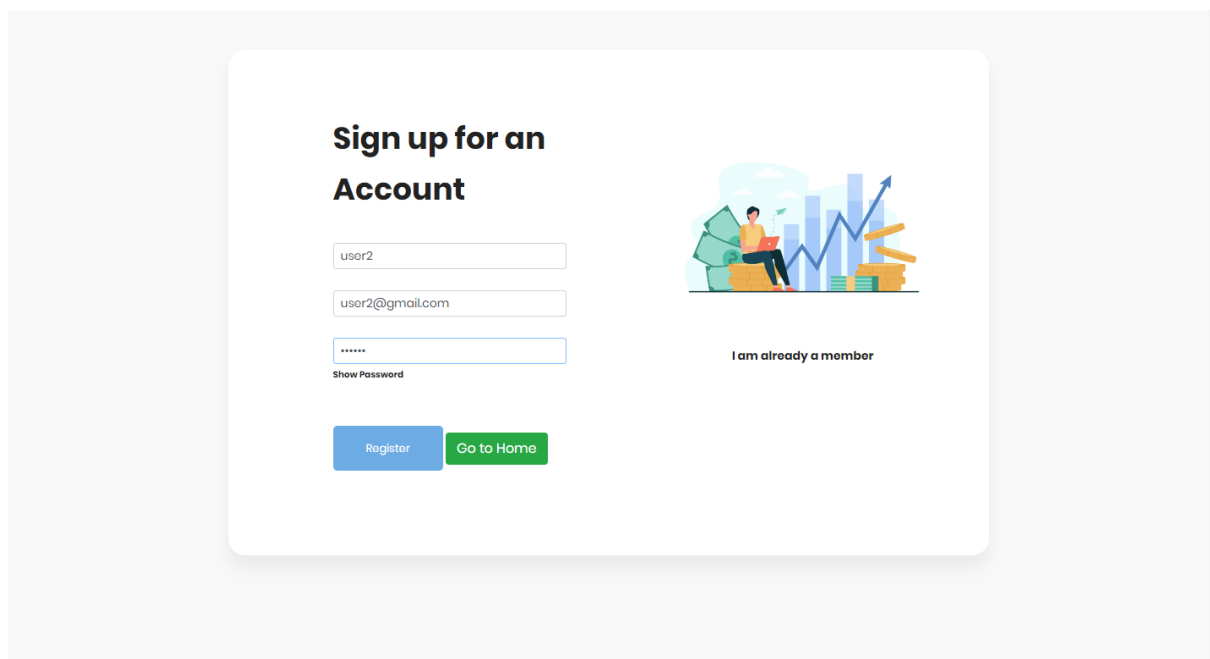
The Django admin site is customised with the Django-jazzmin library, which helps to make the user interface more interactive and it provides more facilities such as sidebar, logo, logo image, filtering options, show recent actions etc.

- **Landing Page**



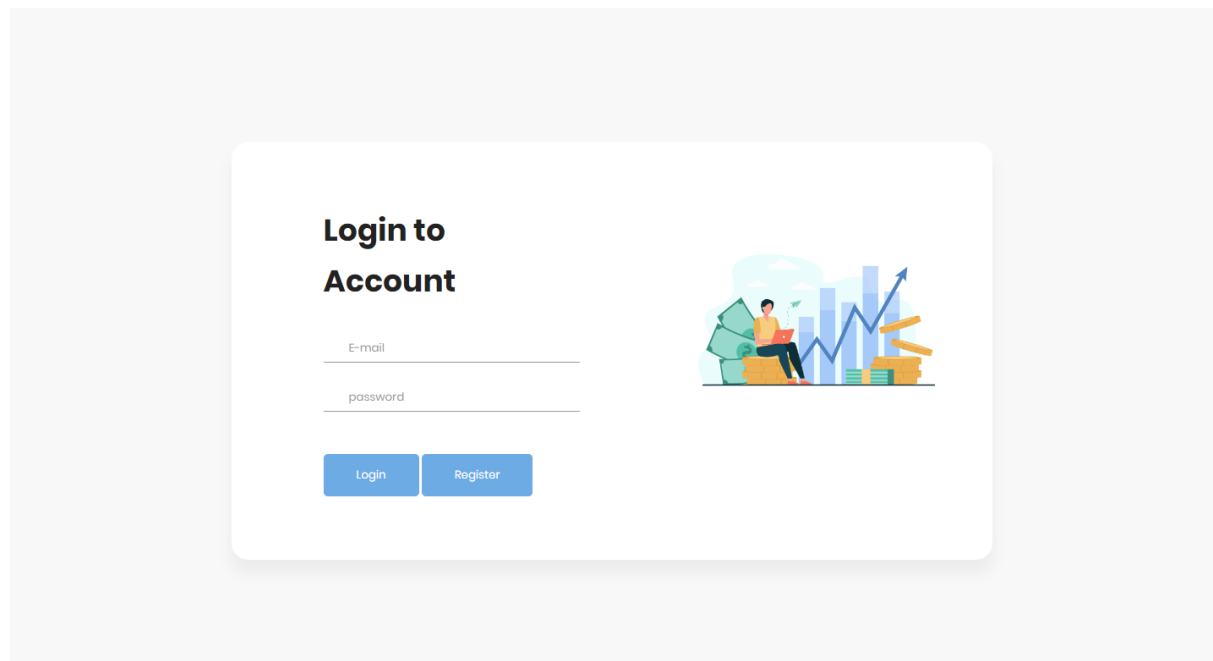
This is the landing page upon accessing the website with contains option like signup and login.

- **Sign up page**



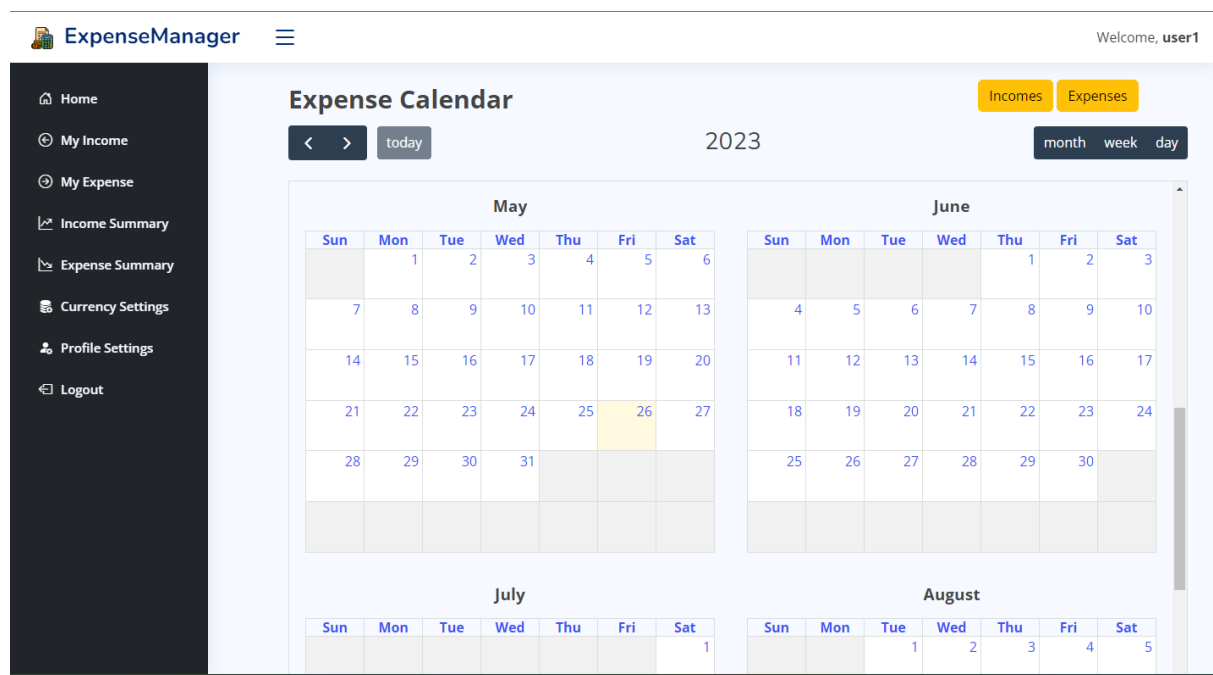
This page lets users register new users in order to avail the services within the application.

- Login page

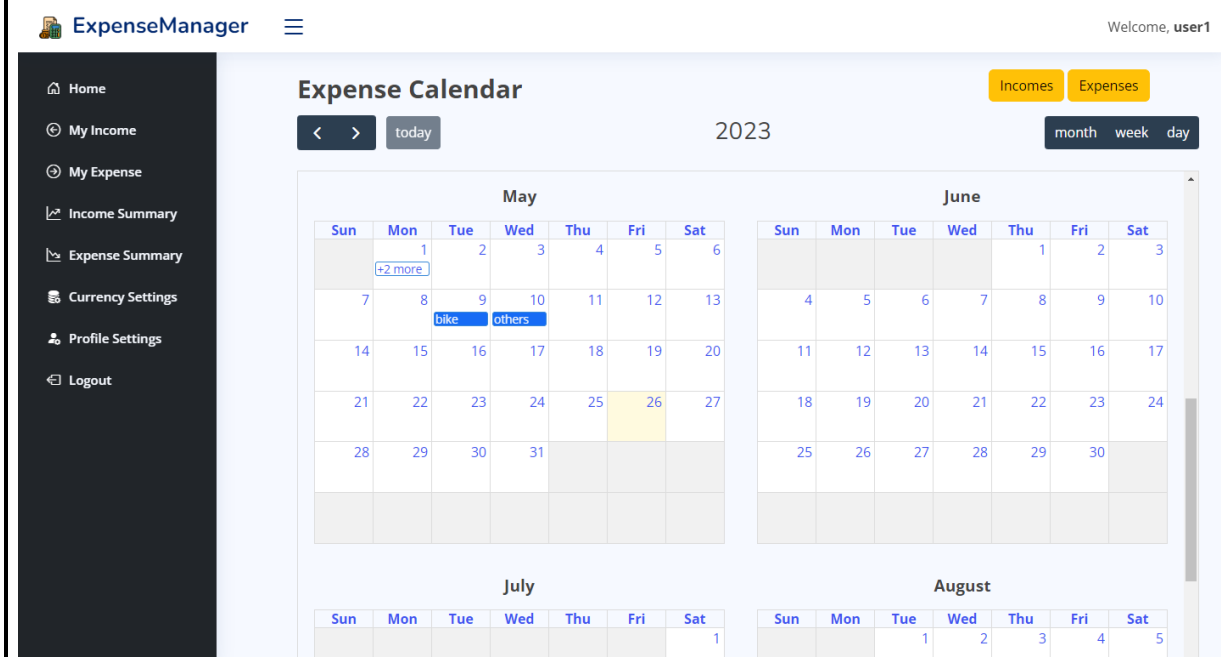
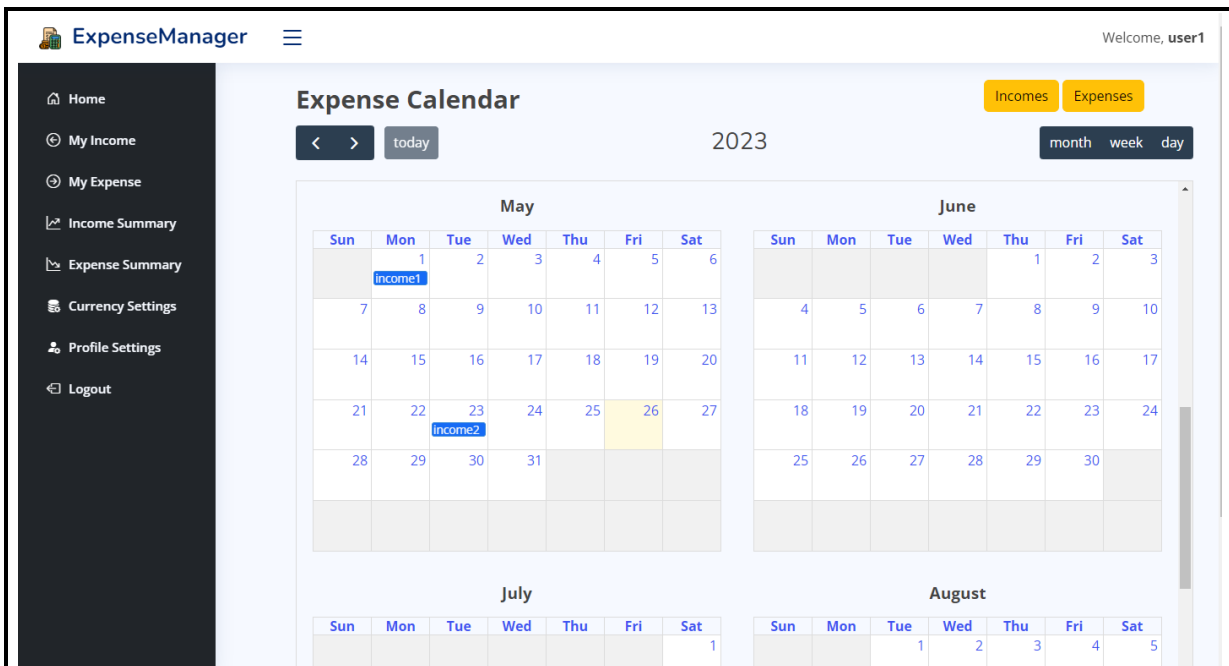


This page lets users login with the valid credentials that are registered during sign up.

- Home Page



This is the main page where users are welcomed with a calendar with also acts as a view of individual incomes and expenses of users on daily basis.



The above images show the summary of incomes and expenses that are entered by users in two separate calendars respectively. The view can be changed into month, week and day view as per requirement.

- Income module

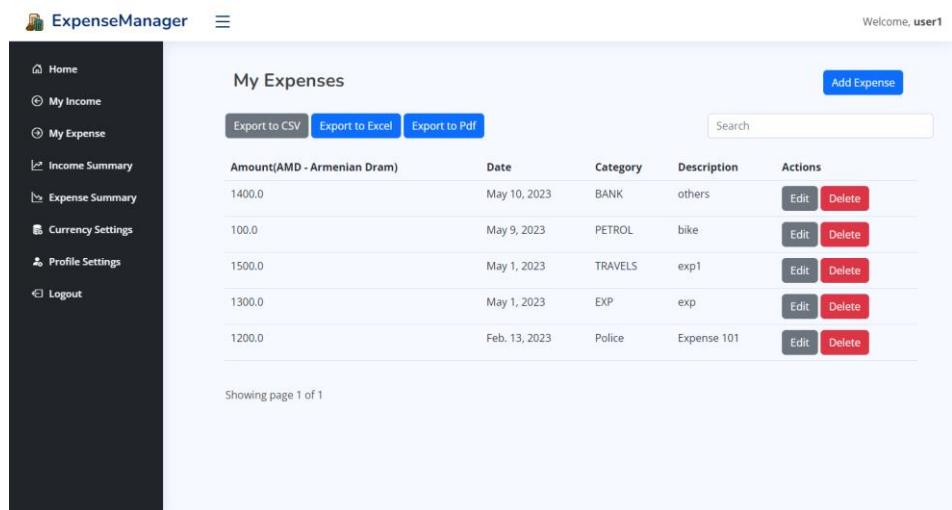
The first screenshot shows the 'My Incomes' page. It features a sidebar with navigation links: Home, My Income, My Expense, Income Summary, Expense Summary, Currency Settings, Profile Settings, and Logout. The main content area has a header 'My Incomes' with an 'Add Income' button. Below the header are export buttons (Export to CSV, Export to Excel, Export to Pdf) and a search bar. A table lists income entries with columns: Amount(AMD - Armenian Dram), Date, Source, Description, and Actions. The table contains two rows: one with Amount 100.0, Date May 23, 2023, Source BANK, Description income2, and Actions Edit/Delete; and another with Amount 1200.0, Date May 1, 2023, Source EDUCATION, Description income1, and Actions Edit/Delete. A footer indicates 'Showing page 1 of 1'.

The second screenshot shows the 'Add Income' page. It has the same sidebar. The main content area has a header 'Add Income' with a breadcrumb 'My Incomes / Add Incomes'. Below the header are input fields for Amount, Description, Category, and Date of Income (with a date picker icon). A 'Submit' button is at the bottom.

The third screenshot shows the 'Edit Income' page. It has the same sidebar. The main content area has a header 'Edit Income' with a breadcrumb 'My Incomes / Edit Incomes'. Below the header are input fields for Amount (pre-filled with 100.0), Description (pre-filled with income2), Source (pre-filled with BANK), and Date of Income (pre-filled with 23/05/2023 and a date picker icon). A 'Save' button is at the bottom.

The following screenshots shows the ability to add, edit view incomes.

- Expense module



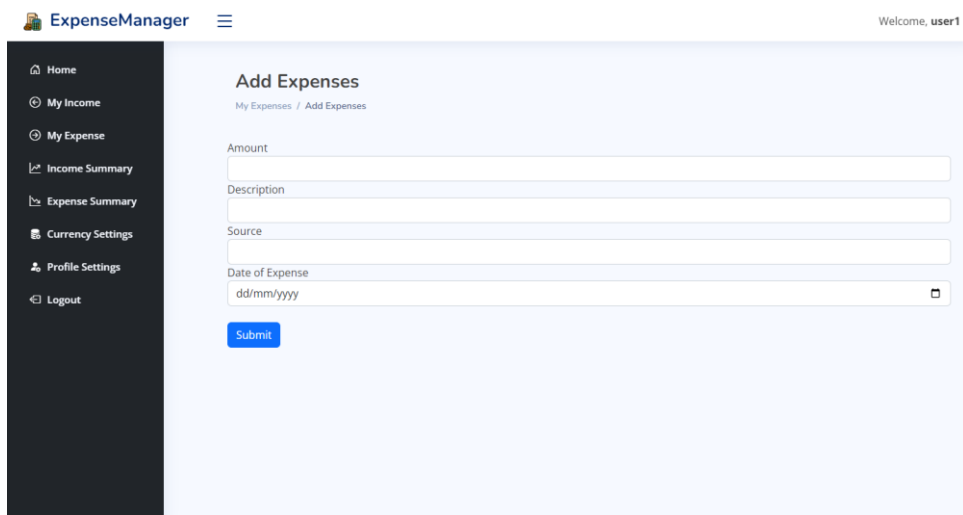
ExpenseManager Welcome, user1

My Expenses

Export to CSV Export to Excel Export to Pdf Search

Amount(AMD - Armenian Dram)	Date	Category	Description	Actions
1400.0	May 10, 2023	BANK	others	Edit Delete
100.0	May 9, 2023	PETROL	bike	Edit Delete
1500.0	May 1, 2023	TRAVELS	exp1	Edit Delete
1300.0	May 1, 2023	EXP	exp	Edit Delete
1200.0	Feb. 13, 2023	Police	Expense 101	Edit Delete

Showing page 1 of 1



ExpenseManager Welcome, user1

Add Expenses

My Expenses / Add Expenses

Amount

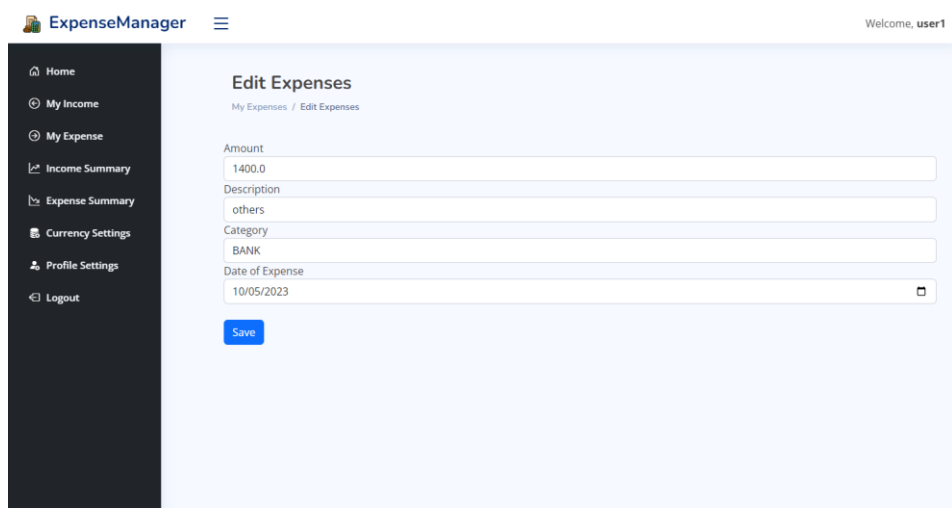
Description

Source

Date of Expense

dd/mm/yyyy

Submit



ExpenseManager Welcome, user1

Edit Expenses

My Expenses / Edit Expenses

Amount

1400.0

Description

others

Category

BANK

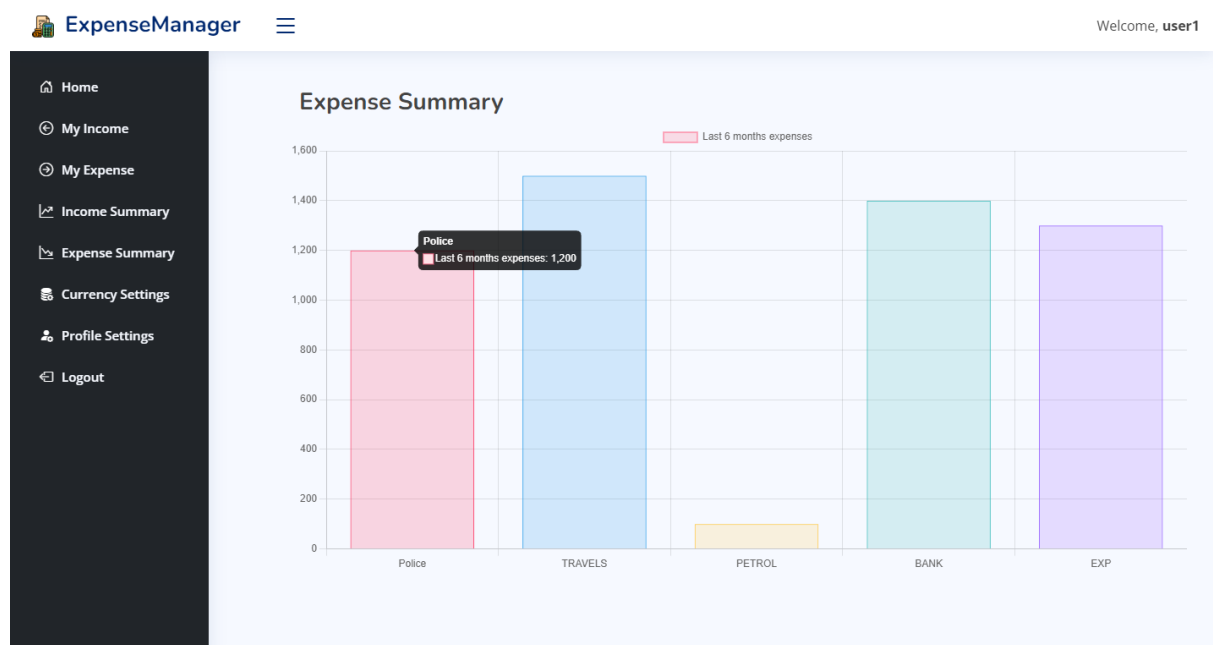
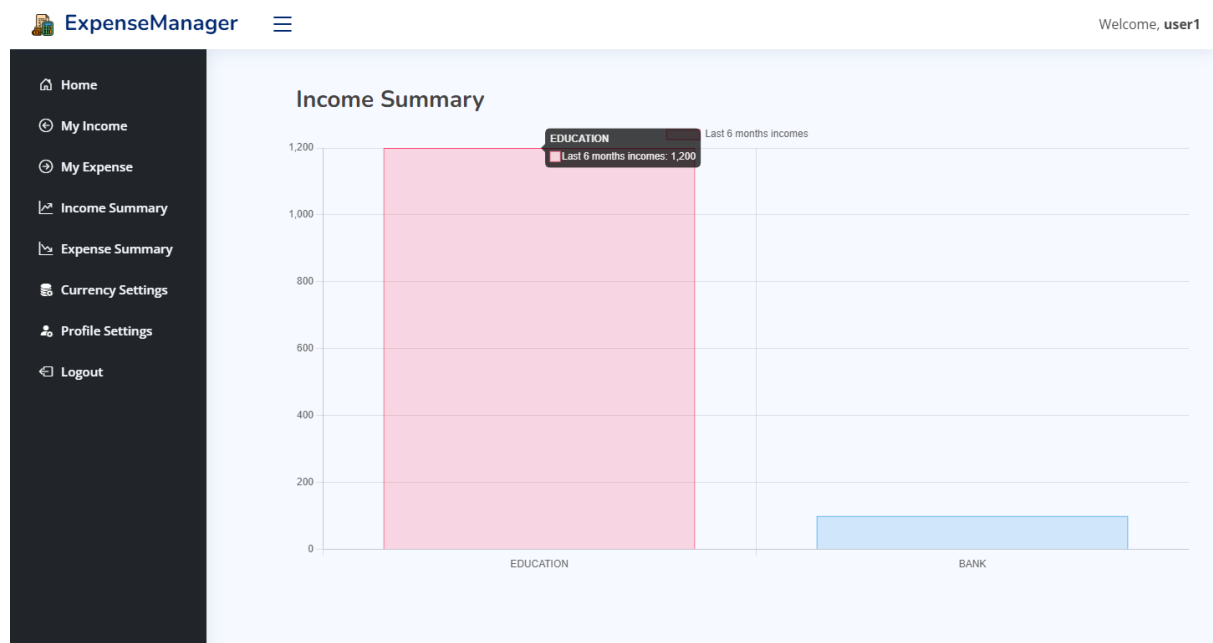
Date of Expense

10/05/2023

Save

The following screenshots shows the ability to add, edit view incomes.

- Income and Expense Summary



The following screenshots shows the various incomes and expenses represented in bar charts which are distinguished on the basis of various user defined categories.

- **Currency Settings**

The screenshot shows the 'Currency Settings' page. On the left is a dark sidebar with a menu: Home, My Income, My Expense, Income Summary, Expense Summary, Currency Settings (highlighted), Profile Settings, and Logout. The top header includes the 'ExpenseManager' logo, a hamburger menu icon, and the text 'Welcome, user1'. The main content area is titled 'Preferred Currency' and features a dropdown menu currently showing 'AMD - Armenian Dram' with a 'Save' button to its right.

The following page lets users choose a common currency to be displayed throughout the incomes and expenses.

- **Profile Settings**

The screenshot shows the 'Profile Management' page. The sidebar and header are identical to the previous page. The main content area is titled 'Profile Management' and includes a 'Back' button in the top right. It contains three input fields: 'Username' (with 'user1' entered), 'Email' (with 'user1@gmail.com' entered), and 'Password' (with '1234567' entered). A blue 'Submit' button is located below the password field.

The following page lets users edit their profile details like username and password.

Future Enhancements

As Future Enhancements, I would like to add feature like:

- Live Budget alerts
- Live income and expense insertion after transactions
- Ability to customize the income and expense summaries shown as graph on the basis of dates.
- Live Currency conversion rates and the ability to customize the incomes and expenses on the basis of these conversion rates.
- Expense and Income import feature from excel
- Smart budget recommendation from analysis on previous transactions

Conclusion

In conclusion, the Expense Management application is a powerful tool that simplifies and enhances personal expense management. With its user-friendly interface and robust features, users can effortlessly track, categorize, and control their expenses, leading to better financial health and improved financial well-being.

Through insightful visualizations and reports, the application provides users with clear and concise summaries of their financial data. These analytics enable users to identify spending patterns, recognize areas for improvement, and make informed financial decisions.

Overall, the Expense Management application is a valuable tool for individuals seeking to gain control over their finances, achieve their financial goals, and improve their overall financial well-being. By simplifying expense management and providing useful features, the application empowers users to make smarter financial choices and navigate their financial journey with confidence.

References

- Django documentation
- Pypi
- ChatGpt
- FullCalendar Js documentation
- ChartJs documentation