# Expense Manager
## 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 KUTTIKKANAM (AUTONOMOUS)

MAKING COMPLETE

## Marian College Kuttikanam 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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**Peermade, Kerala – 685 531**
**2023**

**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

## Expense Manager

is a bonafide 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

**Ms.Kochumol Abraham**

Assistant Professor

PG Department of Computer Applications

Marian College Kuttikkanam Autonomous

**Mr.Win Mathew John**

Head of the Department

PG Department of Computer Applications

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**Examiner**

**Examiner**

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Finally, I express my deep appreciation to all my friends and family members for the moral support and encouragement they have given to complete this project work successfully.


NITHIN GEORGE

# ABSTRACT OF EXPENSE MANAGER PROJECT

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.

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.

# Table of Contents

# 1. INTRODUCTION

# 1. INTRODUCTION

In today's fast-paced world, effective expense management is crucial for individuals and businesses alike. Keeping track of financial transactions, managing receipts, and staying on top of budgeting can often become overwhelming and time-consuming. To address these challenges, this project report presents Expense Manager, an innovative expense management application designed to simplify and streamline expense tracking processes.

## 1.1 PROBLEM STATEMENT

Traditional expense management methods, such as manual receipt tracking and spreadsheet-based tracking systems, are prone to errors, inefficiencies, and lack of real-time insights. These outdated approaches can result in inaccurate financial reporting, delayed reimbursements, and missed opportunities for cost optimization. Therefore, there is a pressing need for a modern expense management solution that enhances accuracy, efficiency, and convenience.

Limitations of existing system

- **Managed manually:** All report calculation are done manually so there is a chance of error.
- **Data stored in papers:** User records transactions in books which are more prone to get lost.
- **Not user friendly:** The present system is not user friendly because data is not stored in a structured and proper format.
- **Time consuming**

## 1.2 PROPOSED SYSTEM

The primary objective of our project is to develop and present Expense Manager as an intuitive and feature-rich expense management application.

The specific goals are as follows:

- **Provide a user-friendly interface for effortless expense entry, categorization, and tracking**: Expense Manager will offer a sleek and intuitive interface that allows users to quickly enter their expenses, assign relevant categories, and track their spending effortlessly.

- **Generate comprehensive expense reports, analytics, and visualizations for informed financial decision-making**: Expense Manger will provide robust reporting capabilities, allowing users to generate detailed expense reports, analyze spending patterns, and gain valuable insights into their financial habits. Visualizations such as charts and graphs will help users identify areas for cost optimization and make informed financial decisions.

## 1.3 FEATURES OF PROPOSED SYSTEM

- Secure user signup and login functionality
- Income and expense management through add, edit and delete options.
- Export option for the income and expenses.
- The ability to manage profile.
- The representation of incomes and expenses graphically.
- A calendar summary for income and expenses.

# 2. FUNCTIONAL

# REQUIREMENTS

## FUNCTIONAL REQUIREMENTS

The Expense Manager application consist of two modules

   **1.User**

   **2.Admin**

### User module

- **User Registration and Login**

   The following module lets users registers and then login with the valid credentials.

- **Income Management**

   The user can add, edit and delete incomes on the basis of category and date.

- **Expense Management**

   The user can add, edit and delete expenses on the basis of category and date.

- **Income Visualizations**

   The system visualizes income data as bar charts on the basis of user defined categories and analyze his transactions.

- **Expense Visualizations**

   The system visualizes expense data as bar charts on the basis of user defined categories and analyze his transactions.

- **Export Income and Expense –** The user can export both incomes and expenses as pdf, csv and excel formats.

### Admin module

- **Manage Users -** Admin can manage the users who have access to the website.

- **Manage User Income and Expense** - In this section, the admin can manage the income and expense of users upon request.

# 3. NON-FUNCTIONAL

# REQUIREMENTS

## NON-FUNCTIONAL REQUIREMENTS

- **Performance**

  The application should be responsive and provide quick response times for tasks such as expense entry, report generation, and data retrieval.

- **Usability**

  The application should have an intuitive user interface, easy navigation, and clear instructions to make it user-friendly for both novice and experienced users.

- **Reliability**

  The application should be stable and reliable, ensuring that data is not lost or corrupted. It should have appropriate error handling and recovery mechanisms.

- **Security**

  The application should have robust security measures to protect sensitive financial data.

- **Scalability**

  The application should be designed to handle increasing volumes of data and users without significant performance degradation. It should be able to accommodate growth in the number of users and the amount of expense data.

- **Maintenance and Support**

  The application should be designed in a way that facilitates easy maintenance and updates.

# 4. PROJECT REQUIREMENTS

**EXPENSE MANAGER**

The various requirements of the project are as follows:

**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 and custom currency:**

This requirement lets you manage your profile details and lets users set a custom currency according to their preference.

**7**. **Mobile view**:

This requirement must let you view the site in mobile such that it is built 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.

# 5. FEATURES AND

# HIGHLIGHTS

The various features and highlights of this Expense Management System are:

**1**. **Secure user signup and login functionality**:

This feature lets user's 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 the basis of date.

**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.

# 6. TECHNICAL ASPECTS

## 6.1 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.

## 6.2 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 preferencess and view reports.

### 2. Application Layer:

- **ExpenseMain Module**: This module acts as the core functionality of the system, handling expense recording, categorization, and budget visualizations.
- **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 ChartJs 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.

## 6.2 UML Diagram
## Class Diagram of the Project
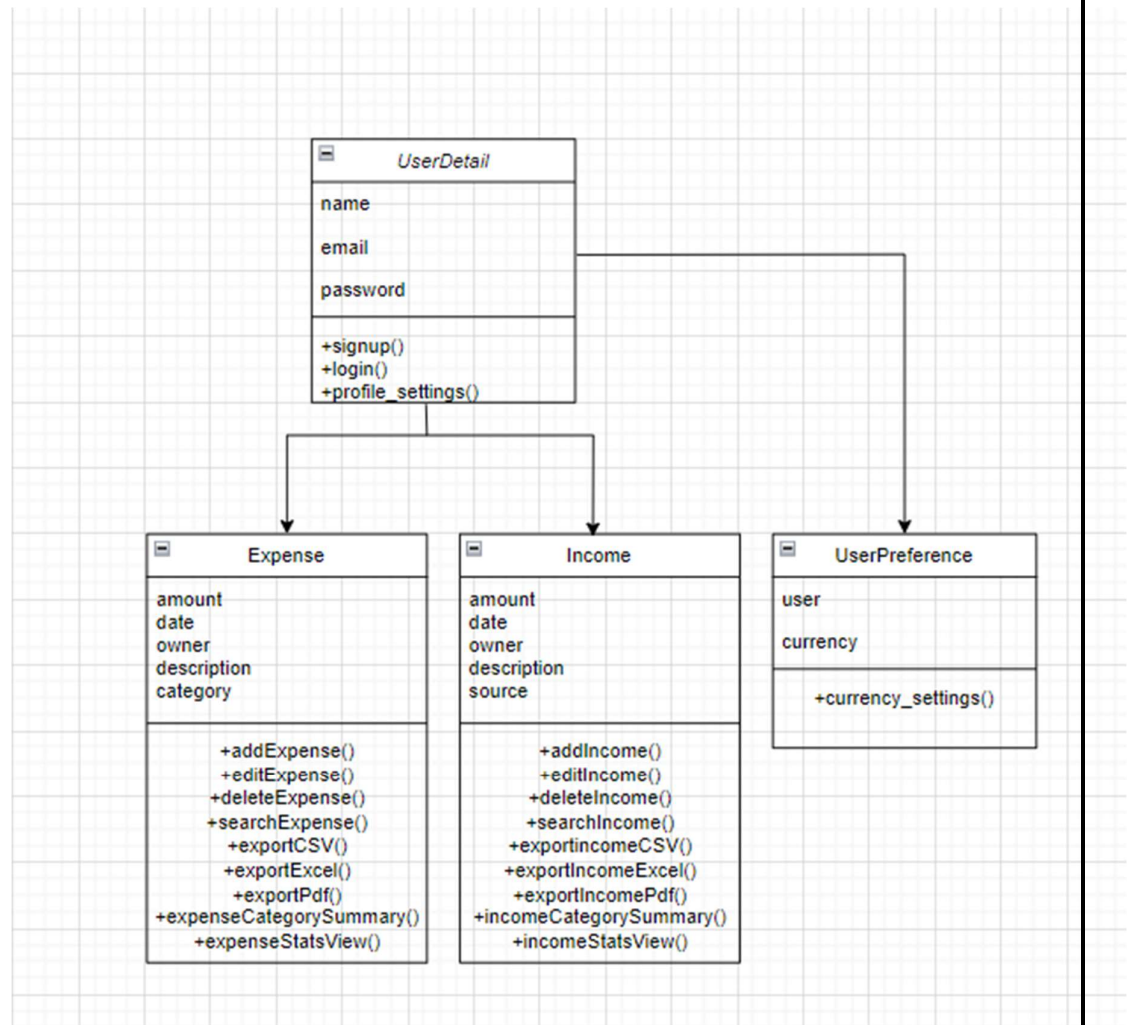
# 7. CHALLENGES FACED DURING DEVELOPMENT

## Challenges faced during development

- **Database Management**

  Configuring and managing the database connections, migrations, and data models was bit challenging, especially when dealing with complex relationships and data transformations.

- **Authentication and Authorization**

  Implementing user authentication, managing user roles and permissions, and securing sensitive data

- **Templating and Front-end Integration**

  Integrating front-end frameworks like Bootstrap and handling dynamic content rendering through Django's template engine.

- **URL Routing and Views**

  Configuring URL routing patterns and mapping them to appropriate views was confusing at times, especially when dealing with dynamic URLs, query parameters, and complex URL structures.

- **User Experience**

  Designing a user-friendly interface and ensuring a seamless user experience can be challenging. It requires understanding the needs and preferences of users and implementing intuitive navigation and forms for booking and scheduling slots.

- **Scalability and Performance**

  As the user base grows and more people book slots simultaneously, the system needs to handle increased traffic and maintain optimal performance. Scaling the application and optimizing the database queries, caching mechanisms, and server configurations may be necessary to maintain responsiveness.

- **Testing and Quality Assurance**

  Writing comprehensive tests to cover various scenarios, including edge cases and error conditions, can be time-consuming. Ensuring the system is tested

thoroughly to prevent bugs, handle exceptions gracefully, and provide a stable user experience requires careful planning and execution.

- **Implementing FullCalendar Js**

Passing data from database to the calendar was quite difficult at first but eventually was able to pass the data as events such that they are returned as a summary on the basis of each day.

- **Implementing ChartJs**

Formatting the data from database into a pattern that lets JS detect the data's and render as charts was quite difficult initially, but it was resolved after several alterations in the code.

# 8. FUTURE ENHANCEMENTS

Here are future enhancements for the Expense Management System project:

- **Live Budget alerts**

  The following feature lets you set a limit for the budget that you could spend each month and if in case the expense exceeds the budget limit, then a warning is sent as an alert to the user notifying that the user must limit his expenses.

- **Live income and expense insertion after transactions**

  The following feature automatically reads all your income and expense statements from each transaction and automatically inserts into the system so that the user doesn't have to manually enter the data's. This could be undertaken by adding the user cards and with the help of some API's the system automatically detects transactions and updates them into the system.

- **Customized Income and Expense Charts**

  This feature lets you filter the income and expense chart visualizations on the basis of from and to dates. Currently, the user has only the ability to view visualizations based on transactions made within the last 6 months. As a future update, the system would let users select custom dates and render visualizations as per requirement on the basis of user defined categories.

- **Live conversion rates**

  This feature lets users view the live currency conversion rates and moreover, the system converts all the previous incomes and expenses from one currency rate to another under a single click as per user requirement.

- **Income and Expense import form excel**

  The following feature lets users import data from excel sheets so that a huge dataset could be imported to the system under a single click.

- **Smart budget recommendation**

  The following feature analyses users spend pattern and provides efficient ways to manage expenses and the best way to save money.

# 9. CONCLUSION

In conclusion, the Expense Management System 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.

### GitHub Repository link of the project:

https://github.com/nithin200051/ExpenseManager

# 10. REFERENCES

- **Django documentation**

  https://docs.djangoproject.com/en/4.2/

- **Pypi**

  https://pypi.org/

- **ChatGpt**

  https://chat.openai.com/

- **FullCalendar Js documentation**

  https://fullcalendar.io/docs

- **ChartJs documentation**

  https://www.chartjs.org/docs/latest/

- **Procurify**

  www.procurify.com

# 11. ANNEXURE

## A. SCREENSHOTS

- **Admin panel**
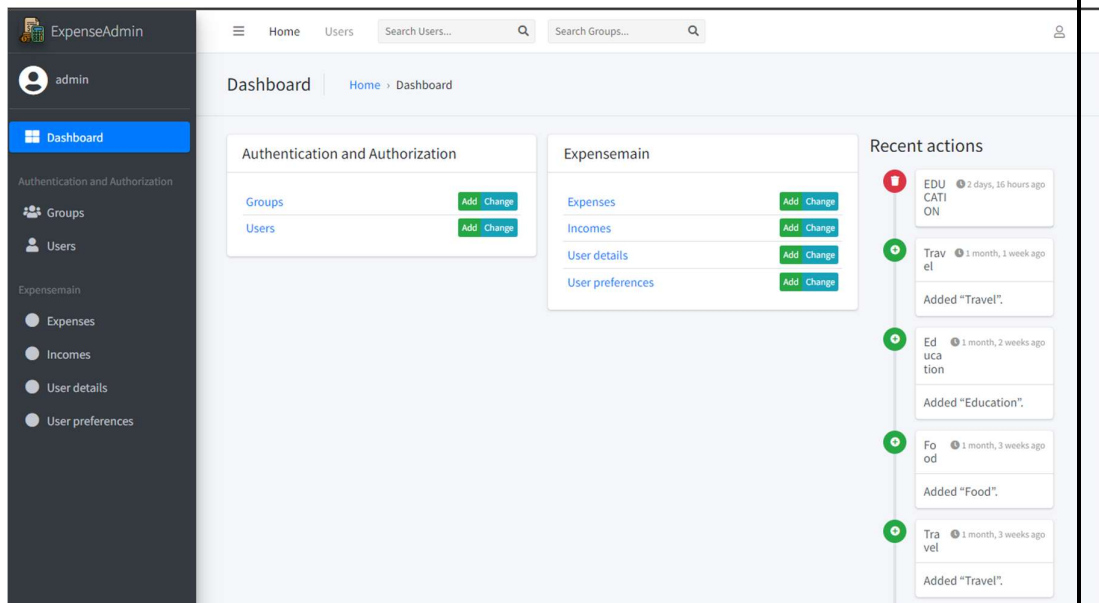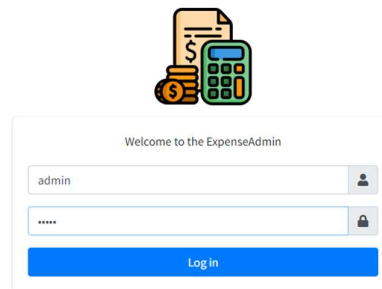


The Django admin site is customised with the Django-jazzmin library, which helps to make the user interface more interactive and it provides more facilities such as sidebar, logo, logo image, filtering options, show recent actions etc.
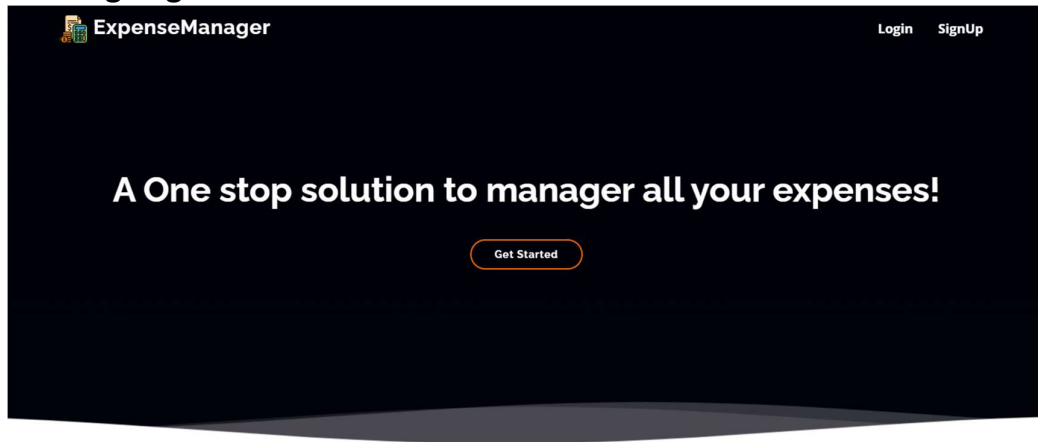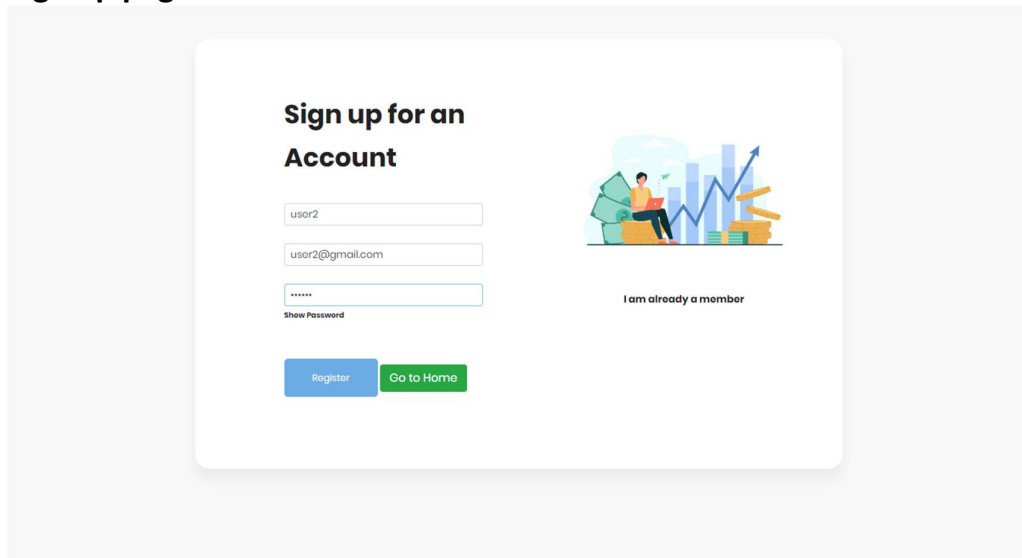
- **Landing Page**



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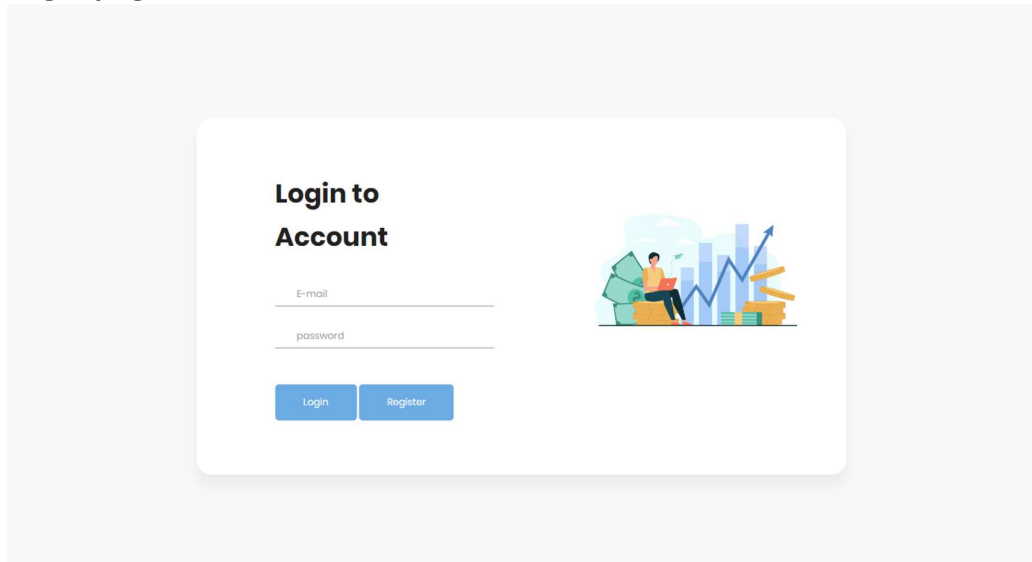
- **Sign up page**



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

- **Login page**



This page lets user's login with the valid credentials that are registered during sign up.

- **Home Page**
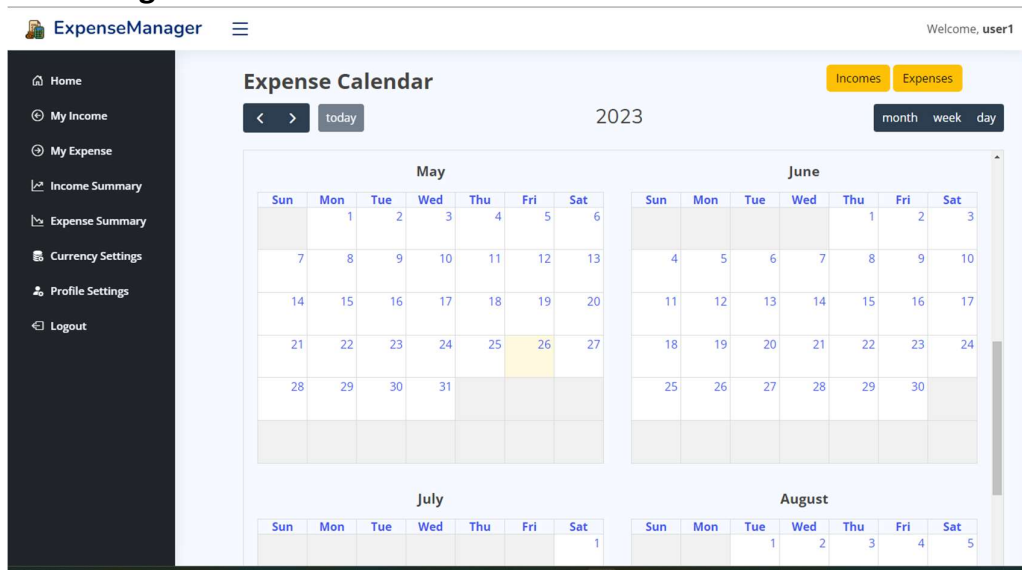


This is the main page where users are welcomed with a calendar with also acts as a view of individual incomes and expenses of users on daily basis.

**EXPENSE MANAGER**
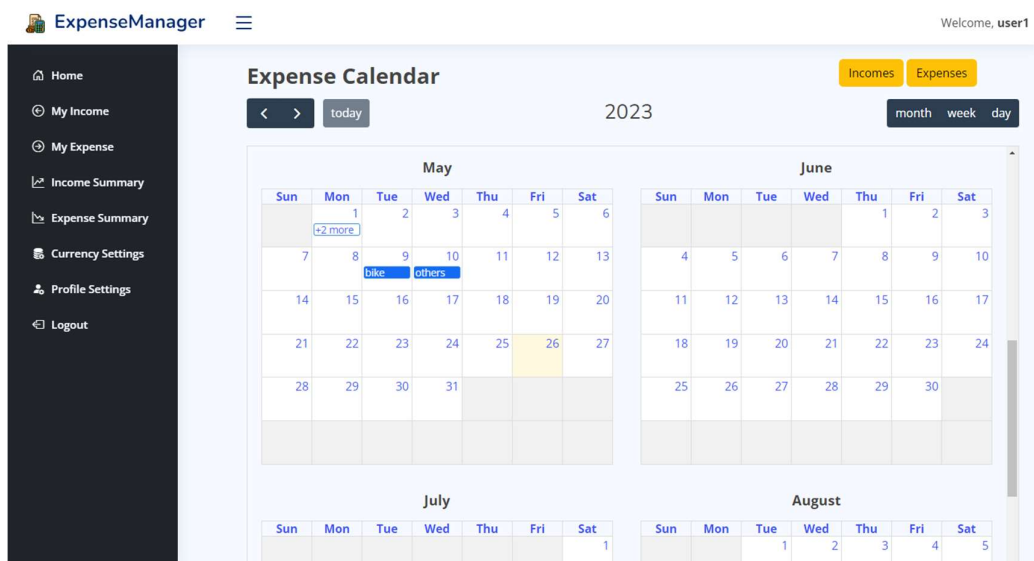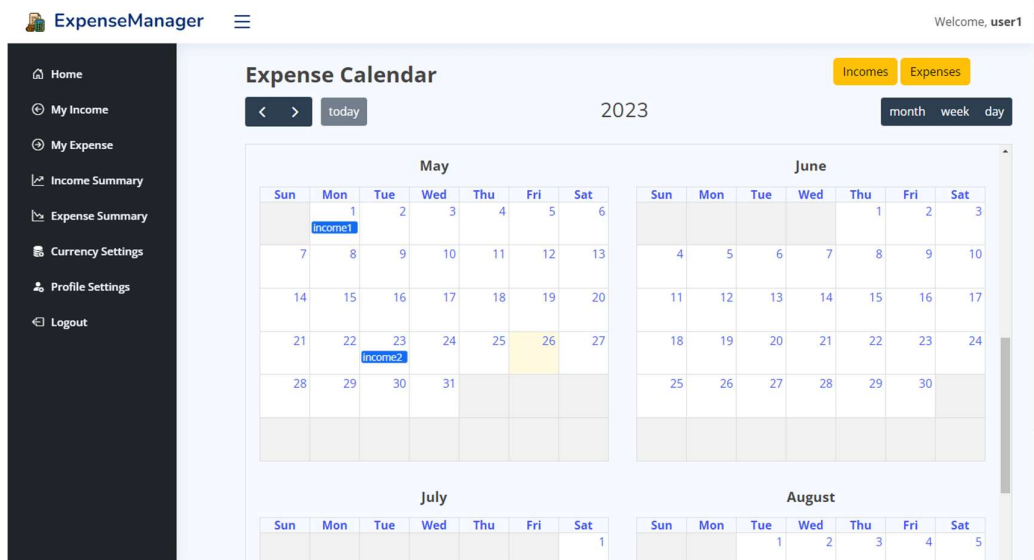


The above images shows the summary of incomes and expenses that are entered by users in two separate calendars respectively. The view can be changed into month, week and day view as per requirement.

**EXPENSE MANAGER**

- ## **Income module**



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

- **Expense module**







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

**EXPENSE MANAGER**
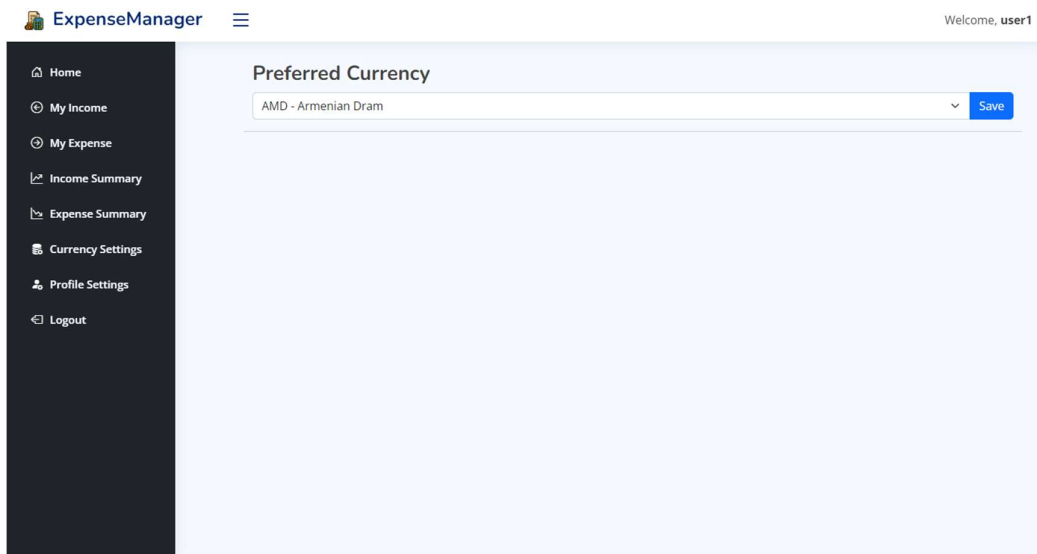
- **Income and Expense Summary**
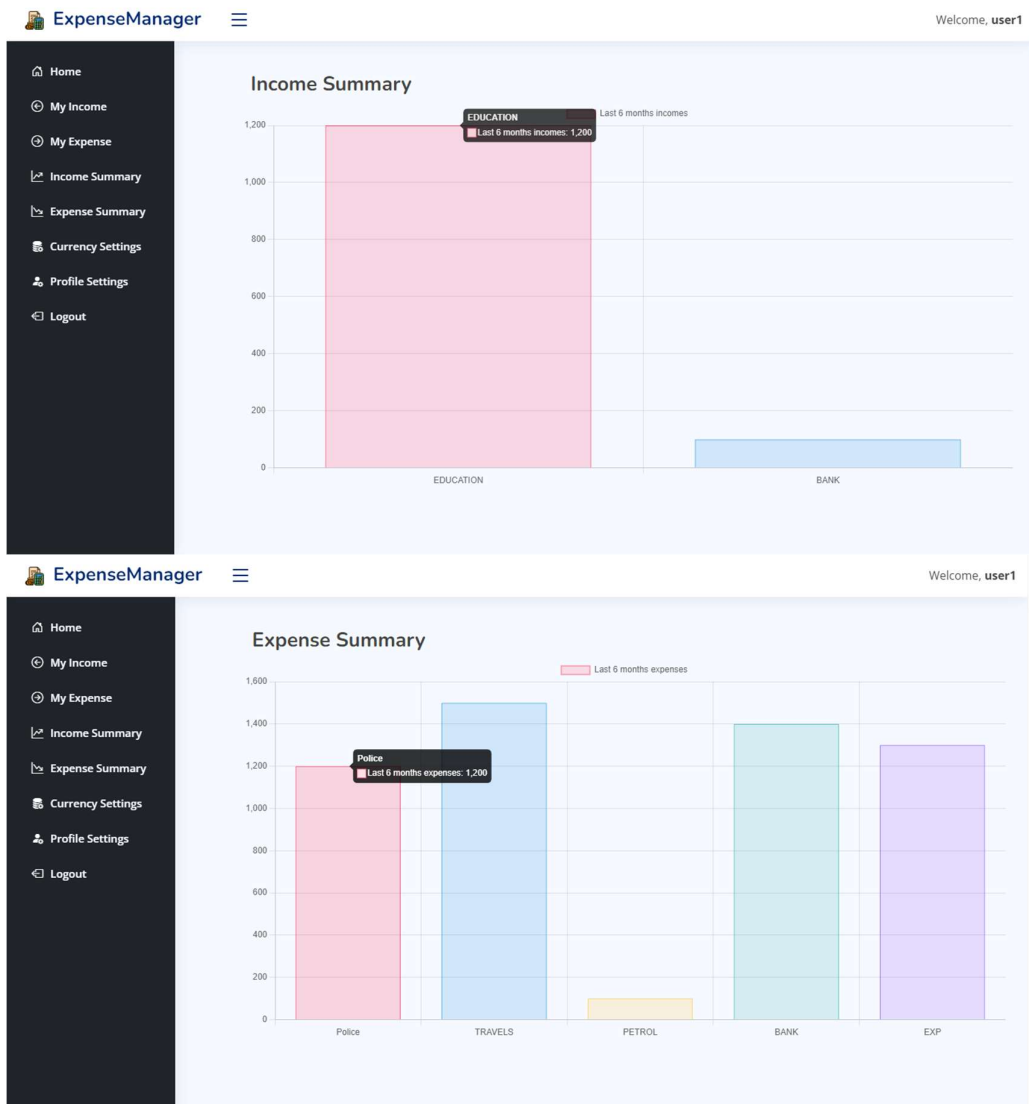


The following screenshots shows the various incomes and expenses represented in bar charts which are distinguished on the basis of various user defined categories.
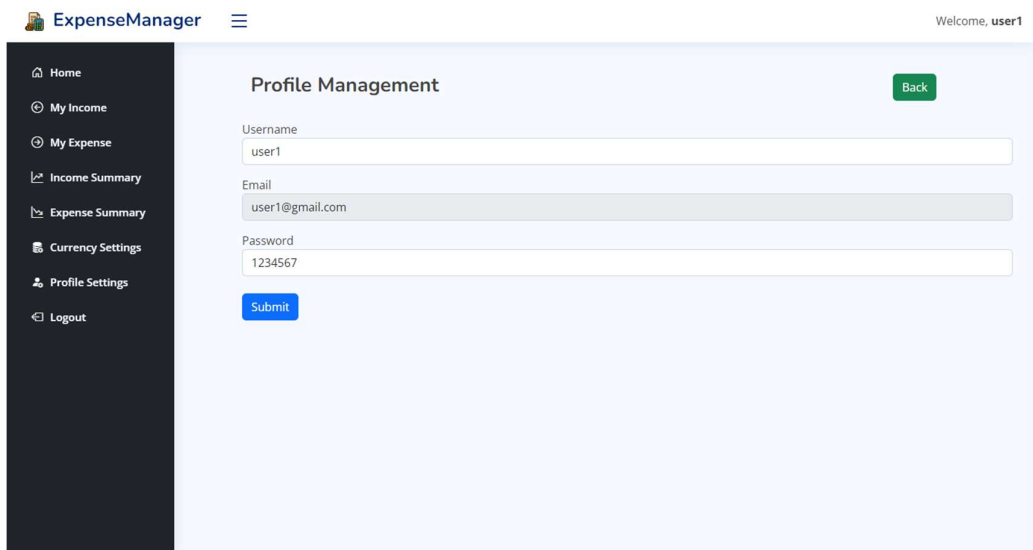
- **Currency Settings**



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

- **Profile Settings**



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