PERSONAL EXPENSE TRCKER APPLICATION

A PROJECT REPORT

NALAIYA THIRAN PROJECT

TEAM ID: PNT2022TMID38736

Submitted by

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1. INTRODUCTION

1.1 Project Overview

This report entails the **Personal Expense Tracker Application** built with HTML, Flask and Docker. This project was developed by Abinayashri A, Srimathi S, Vasela Parvin L, Suvashini S students of CK College Of Engineering And Technology under the guidance of Vimal Raja R, faculty mentor and Khusboo, industrial mentor from IBM for the Nalaiyathiran scheme of 2022.

1.2 Purpose

A personal finance app makes life easier by helping you to manage your finances efficiently. A personal finance app will not only help you with budgeting andaccounting but also give you helpful insights about money management.

Personal finance applications will ask users to add their expenses and based on their expenses wallet balance will be updated which will be visible to the user. Also, users can get an analysis of their expenditure in graphical forms. They have an option to set a limit for the amount to be used for that particular month if the limit is exceeded the user will be notified with an email alert

2. LITERATURE SURVEY

2.1 Existing problem

The current problem is that users are not motivated to monitor their expenses and not willing to alter their spending trends. Our system introduces a goal and reward system to beat the problem. Secondly, the feature of sending reminders for recurring bills is a key feature in this app. Most often, users do not have the right guidance with spending and it is hard for them to analyze their mistakes. To make this process simpler, our app displays the spending trends as a graph to help users analyse and find the real reason behind his inability to meet their goals.

2.2 Literature Survey

[1] Title : Security and privacy challenges in mobile cloud computing : survey and way ahead
Author : Muhammad Baqer Mollah et al
Journal : Journal of Network and Coumputer Applications
Year : 2017
Methodology : Computational offloading, Virtualization
Scope : The primary security and privacy issues facing cloud computing are highlighted in this survey in order to raise awareness within the academic and scientific communities. While there are many difficulties, comparable security solutions have been suggested and found in the literature by numerous researchers to address the difficulties. The recent works are also briefly presented in this work.

[2] Title : Exploring infrastructure support for app based services on cloud platforms
Author : Hai Nguyen et al
Journal : Journal of Cloud Computing Advances Systems and Applications
Year : 2017
Methodology : Virtualization, Introspection and Security
Scope : In this paper, a rich model's design and implementation are discussed, allowing third-party cloud apps to access a client's virtual machines (VMs) and carry out privileged operations.The infrastructure support required to support cloud apps was discussed. Different design approaches to deploy cloud apps were also addressed. Various examples were used to demonstrate and assess the practicality of cloud applications.

[3] Title : Mobile Financial Management Application using Google Cloud Vision API
Author : Kurniawan Dwi Saputra et al
Journal : International Conference on Computer Science and Computaional Intelligence
Year : 2019
Methodology : Google Vision Cloud API, Optical Character Recognition
Scope : In order to address the primary financial issues , this study looked

at the potential usefulness of the mobile application "Manage on Money (MoM)".OCR technology was created using Google Cloud Vision API. This technique works well for locating a single precise keyword on a receipt printed in black ink.MoM enables users to arrange their recurring expenses and sends a push reminder prior to the due date. OneSignal API serves as the foundation for this notification.

[4] Title : Cloud Based Development Issues
Author : Sukhpal Singh, Inderveer Chana
Journal : International Journal of Cloud Computing and Services Science
Year : 2020
Methodology : A Methodical Analysis
Scope : The systematic representation process, research study findings, and challenges to the study's validity have all been covered in this review paper. By responding to the initially defined questions, the article has demonstrated the areas of research within cloud-based development that have been carried out. This paper presents findings from a rigorous investigation of problems with cloud-based development.

[5] Title : Expense Tracker
Author : Prof Miriam Thomas, Lekshmi P, and Dr.Mahalekshmi T
Journal : International Journal of Advanced Research in Science, Communication and Technology
Year : 2020
Methodology : Least Square Algorithm
Scope : This application allows the user to enter their income to determine their daily expenses, and the results are saved for each user. The application has a feature that uses data mining to predict the manager's income and expenses. The suggested system takes less time to process, and all the information is updated and processed right away.

[6] Title : Cloud based Expense Tracker
Author : Asthha Wahal and Muskan Aggarwal
Journal : International Journal of Innovative Research in Technology
Year : 2021
Methodology : Clustering, Apriori algorithm, Virtualization
Scope : The DET app devleoped through this project includes clustering functionality. The Apriori algorithm allows for the clustering of organizations and individuals. As soon as a transaction is added to the list, an automated update is made to the graph of income and expenses. The information is all kept in local storage, which is the factor that is more crucial.

[7] Title : A Novel Expense Tracker
Author : Muskaan Sharma, Ayush Bansal, Dr. Raju Ranjan, Shivam Sethi
Journal : International Journal of Innovative Research in Technology
Year : 2021
Methodology : Statistical Analysis, Data Mining
Scope : Some statistical analysis was done to be able to give users correct information on their expenses and help them spend better. This helps the society to prevent the issues like bankruptcy and save time from manual calculations.

[8]	Title	:	Student Expense Tracking Application
	Author	:	Saumya Dubey, Pragya Dubey, Rigved Rishabh Kumar, Aaisha Khatoon
	Journal	:	International Journal of Advance Research and Innovative Ideas in Education
	Year	:	2022
	Methodology	:	Clustering, Classification and Association
	Scope	:	A student's costs are tracked in something that is similar to a digital diary. The application records daily financial transactions for the student, including both revenues and expenditures. The main objective of this project is to offer budget tracking in an online format so that every homeowner can review their financial information at any time, from anywhere online using a web browser on their PC or new mobile device.

2.3 References

MINT-INDIVIDUAL/PERSONAL EXPENSES:

a. Mint is a free budgeting app that allows you to connect all of your financial accounts in one digital space
b. After connecting your financial accounts, Mint tracks your transactions and categorises them into budget categories to simplify tracking. Users can keep the default categories provided by Mint or create custom categories to fit theirneeds
c. Track all of your monthly bills through Mint and receive reminders so you caneasily pay your bills on time
d. Mint is meant for individual users and there's no option for joint Mint accounts.Users with joint financial accounts can each create their own Mint account and sync the same accounts to view the same information
e. Mint is free for everyone to use.

GOOD BUDGET -INDIVIDUAL/PERSONAL EXPENSES:

a. "Envelope method" - Users allocate a certain amount of their income into categories of expenses(groceries,clothing).
    i. Users can visualise their spending better and define new goals
b. Not linked to bank accounts/credit cards->manual entry of expenses make users aware of spending
c. 256-bit bank grade encryption in a secure data centre
d. Custom/predefined categories of expenses
e. One year of transaction history

QUICKBOOKS - BUSINESS EXPENSES:

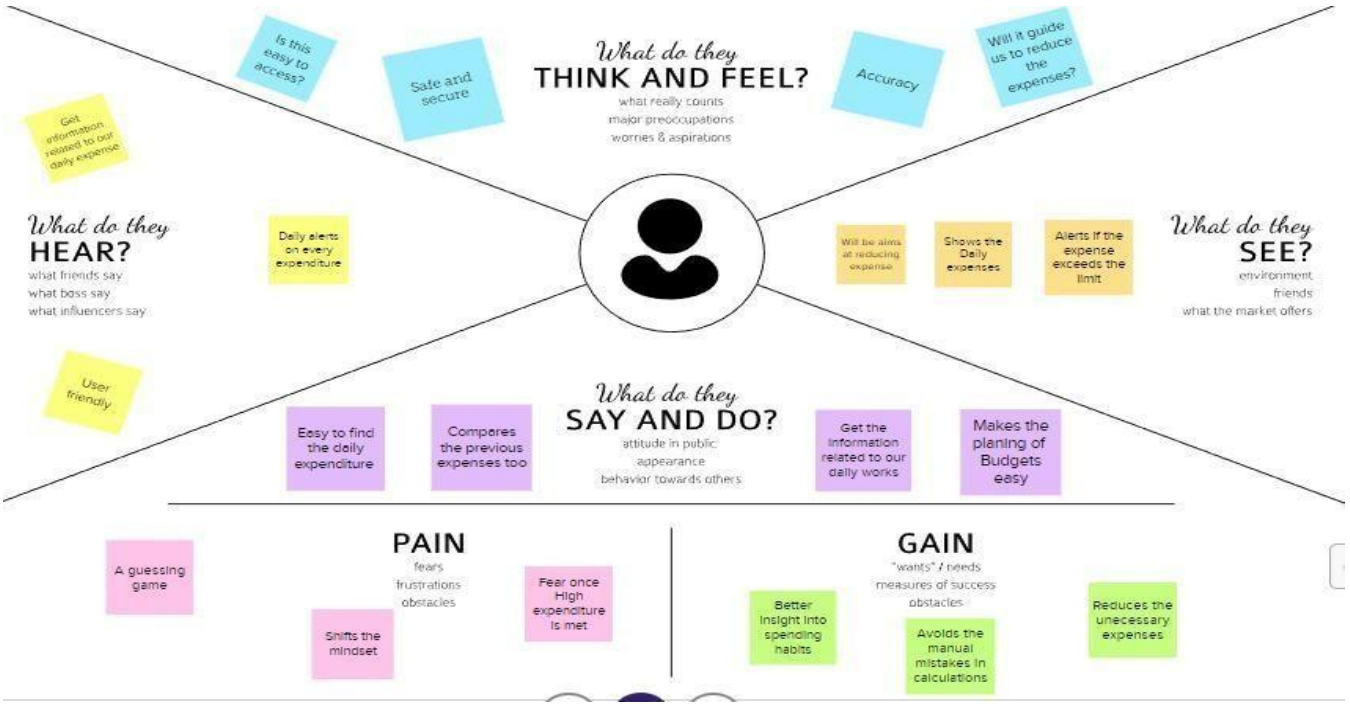
a. Tracks business expenses on the fly, as well as income
b. Syncs to bank accounts, credit cards and third-party apps like PayPal andSquare
c. Offers real-time dashboards to keep user updated on all financial transactionsrelated to their business
d. Different plans according to size of business and requirements(analytics, fast transactions)
e. Full-service payroll is a feature of some plans.

2.4 Problem Statement Definition:

Users spend money on various transactions that may be a part of their daily routine or could be a one-time transaction. Every user has different priorities and thus different expenses. Our team aims to develop a customizable Personal Expense Tracker that allows users to tailor-make the application to suit their needs. We aim to do so through the provision of user-defined expense categories, rewards,goals, and limits to name a few. The application will also provide users with the feature to view a graphical analysis of their expenditure to understand their spending patterns and reach conclusions accordingly.

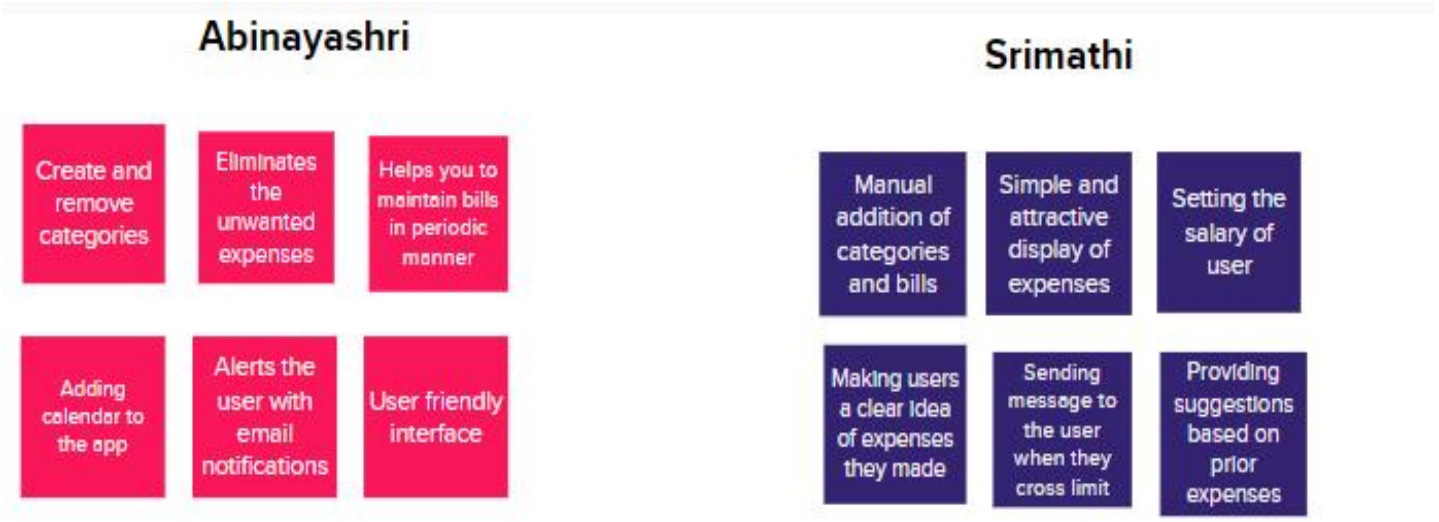
3. IDEATION & PROPOSED SOLUTION

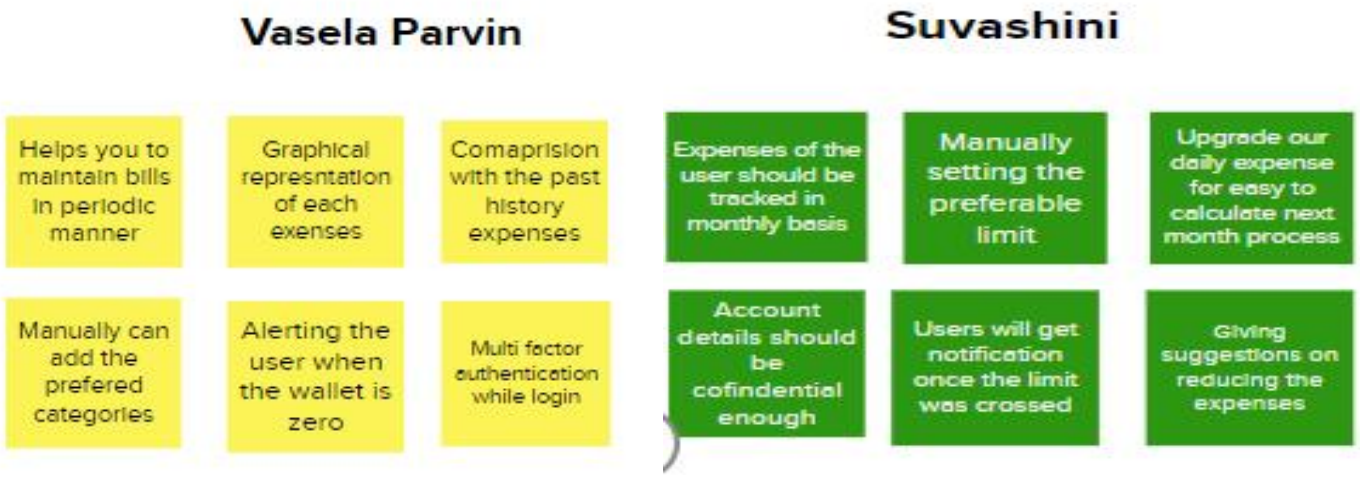
3.1 Empathy Map Canvas:



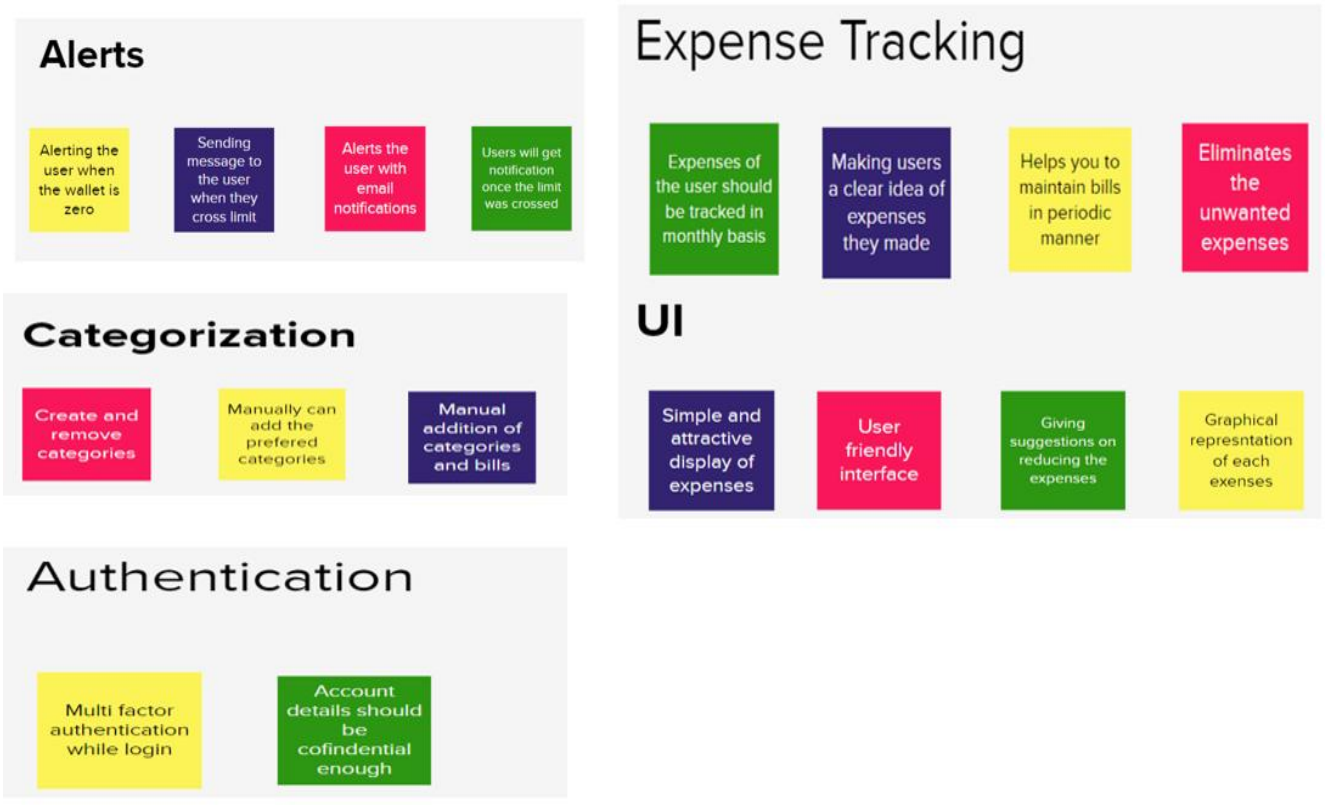
3.2 Ideation & Brainstorming

(i)The listing of ideas from all the team members





(ii) Grouping of Ideas:



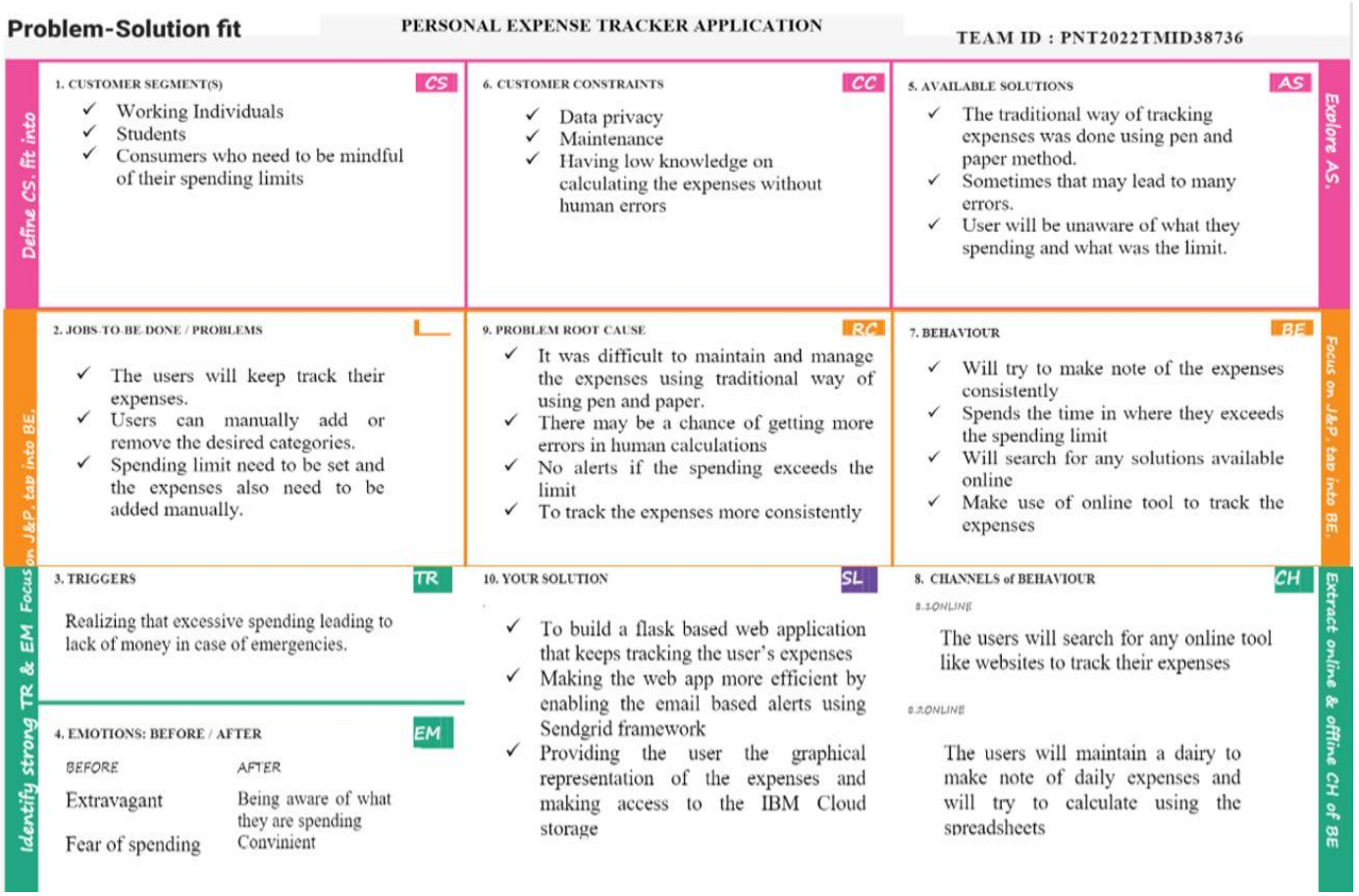
(iii) Idea Prioritization:

3.3 Proposed Solution

S.No	Parameter	Description
1.	Problem Statement(Problem to be solved)	A person must keep a record of their spending either in a computer or a diary. The user must perform all calculations, which occasionally results in mistakes thatlead to financial losses. When you don't keep watch on your spending, you will be short of money, always this will stress you out.An app that recalls or alerts users about recurring payments is necessary for customers who are busy, working individuals.
2.	Idea / Solution Description	The proposed solution will be a flask based web application that will be used to keep tracking the user's expenses. The users will be prompted with the email based alerts using the sendgrid framework once the spending limit exceeds. Also the users will be able to access the IBM cloud storage for their spending details.
3.	Novelty / Uniqueness	✓ It will be a user-friendly, portable web application that is accessible on all devices. ✓ Expense Tracker can provide a clear image of howmuch money is earned and spent using graphical representations, allowing users to evaluate whether they are incurring additional expenses and where they can make savings with the alert mails. ✓ It will further help users put their money where they need to.
4.	Social Impact / Customer Satisfaction	People can use it to keep track of their spending and receive alerts when they go over their budget's spending limit.

5.	Business Model (Revenue Model)	✓ The expense tracker app will provide our customers with essential solutions to problems, making the launch of our software as a paid app is the best and easiest way to generate revenue. ✓ Advertisements are the easiest way to make a consistent income while using a free or lite version of an application.
6.	Scalability of the solution	✓ Storage will be automatically provided to all futureIBM Cloud users. ✓ Each user's data will be saved and the application willrun via cloud services, which may be expanded as necessary.

3.4 Problem Solution Fit



4. REQUIREMENT ANALYSIS

4.1 Functional Requirements

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User Access / Login	Login through e-mail ID & Password
FR-4	User Data	Adding user expenses through input field & categories
FR-5	User Alert	Alerting user through registered e-mail ID

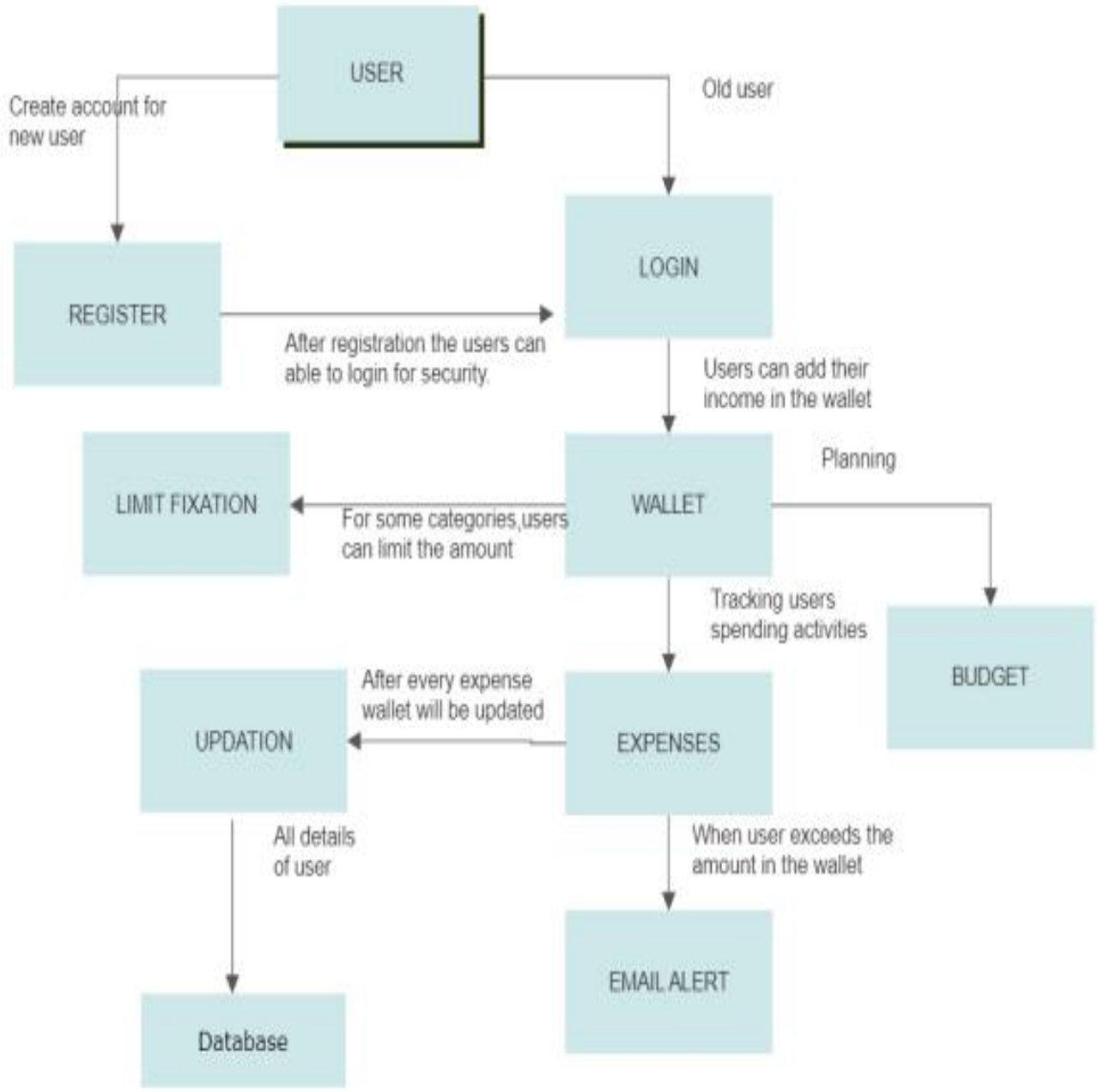
4.2 Non-functional Requirements

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	User friendly interface
NFR-2	**Security**	Strong security system
NFR-3	**Reliability**	Highly reliable for the old age people to trackthe expenses
NFR-4	**Performance**	Low data usage, instant email alerts while exceeding limits.
NFR-5	**Availability**	Available for all platforms (Mobile User, Web User)
NFR-6	**Scalability**	Access Anywhere Anytime

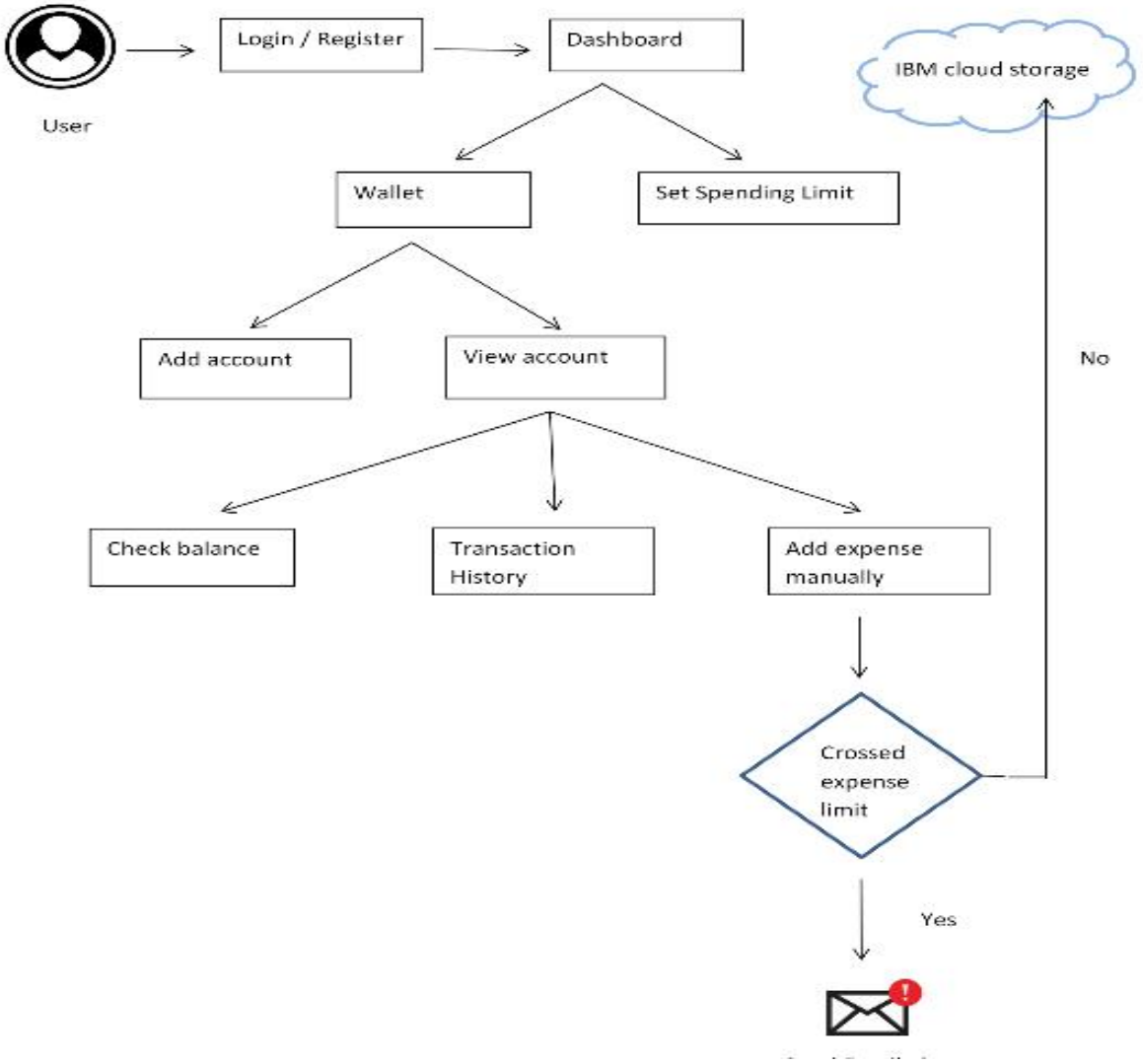
5. PROJECT DESIGN

5.1 Data Flow Diagram:

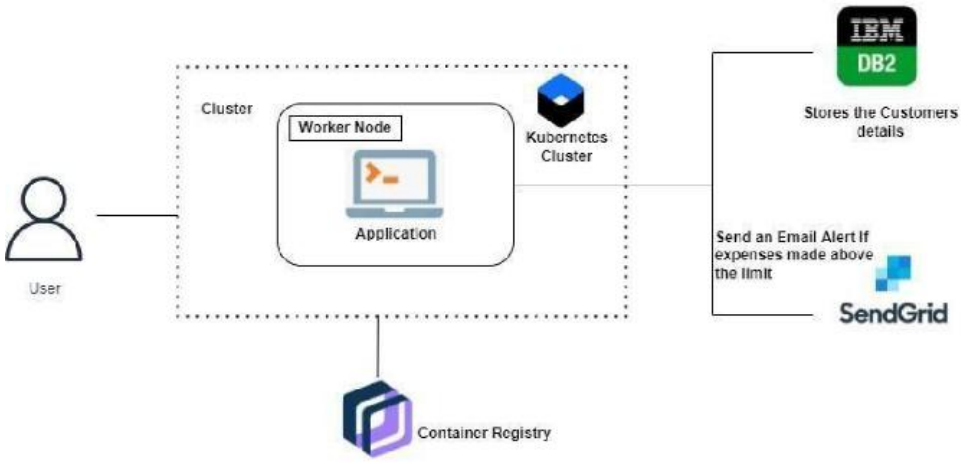


5.2 Solution and Technical Architecture:

Solution Architecture:



Technical Architecture:



MVP Idea: Web application that tracks a user's expenses.

Product Requirements:

1. Initialize balance on signing up.
2. Update balance whenever necessary.
3. Add expenses with optional descriptions.
4. Group related expenses.
5. Modify an expense.
6. Display remaining balance.
7. Display graph of expenditure (over a user-specified period of time).
8. Set a monthly limit on expenditure.
9. Notify users when they exceed their monthly limit.
10. Add specialized support for different types of users such as students, family, etc.

Priority Product Requirements:

1. User authentication.
2. Initialize balance on signing up.
3. Update balance whenever necessary.
4. Add expenses with optional descriptions.
5. Display remaining balance.
6. Set a monthly limit on expenditure.
7. Display summary of expenses.

5.3 User Stories:

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
Customer	Confirmation	USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
Customer	Login	USN-3	As a user, I can login and access my dashboard and expenses page	I can login and if I have been previously registered I can access my account	High	Sprint-1
Customer	Add expense	USN-4	As a user, I can add an expense	Spent amount must be greater than existing amount and balance must be updated accordingly	High	Sprint-2
Customer	Add amount	USN-5	As a user, I can add money to my account anytime necessary	The amount I added must be updated for future transactions	Medium	Sprint-2
Customer	Dashboard	USN-6	As a user, I can view my dashboard to see balance remaining and last transactions and where I have spent them.	All transactions previously must be updated accordingly and details must be fetched accurately	High	Sprint-2
Customer	Alert the user about crossing expenditure	USN-7	As a user, if I exceed my limit I should be warned with an email.	Limit and amount spent up until then must be tracked accordingly.	Low	Sprint-3
Customer	Show customer summary projections	USN-8	Every month end, as a user, I should be able to view my monthly expenses, projections in the form of dashboards and graphs.	Monthly expenses are kept track of and aesthetic projections are being presented to the user	Low	Sprint-4

6. PROJECT PLANNING AND SCHEDULING

6.1 Sprint Planning and Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint 1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	2	High	Abinayashri A
		USN-2	As a user, I will receive confirmation email once I have registered for the application	1	High	Srimathi S
	Login	USN-3	As a user, I can log into the application by entering email & password	1	High	Vasela Parvin L
	Dashboard	USN-4	Logging in takes to the dashboard for the logged user.	`2	High	Suvashini S
Sprint 2	Workspace	USN-1	Workspace for personal expense tracking	2	High	Vasela Parvin L
	Charts	USN-2	Creating various graphs and statistics of customer's data	1	Medium	Suvashini S
Sprint-3	Chatbot	USN-1	Creating Chatbot for expense tracking and for clarifying user's query	3	High	Abinayashri A
	Alerting	USN-2	Using SendGrid to send mail to the user about their expenses	5	High	Suvashini S
Sprint-4	Cloud Registry	USN-1	Uploading docker image to IBM Cloud registry	2	High	Srimathi S
	Kubernetes	USN-2	Create container using the docker image and hosting the site	8	High	Abinayashri A

6.2 Sprint Delivery Schedule:

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

Velocity:

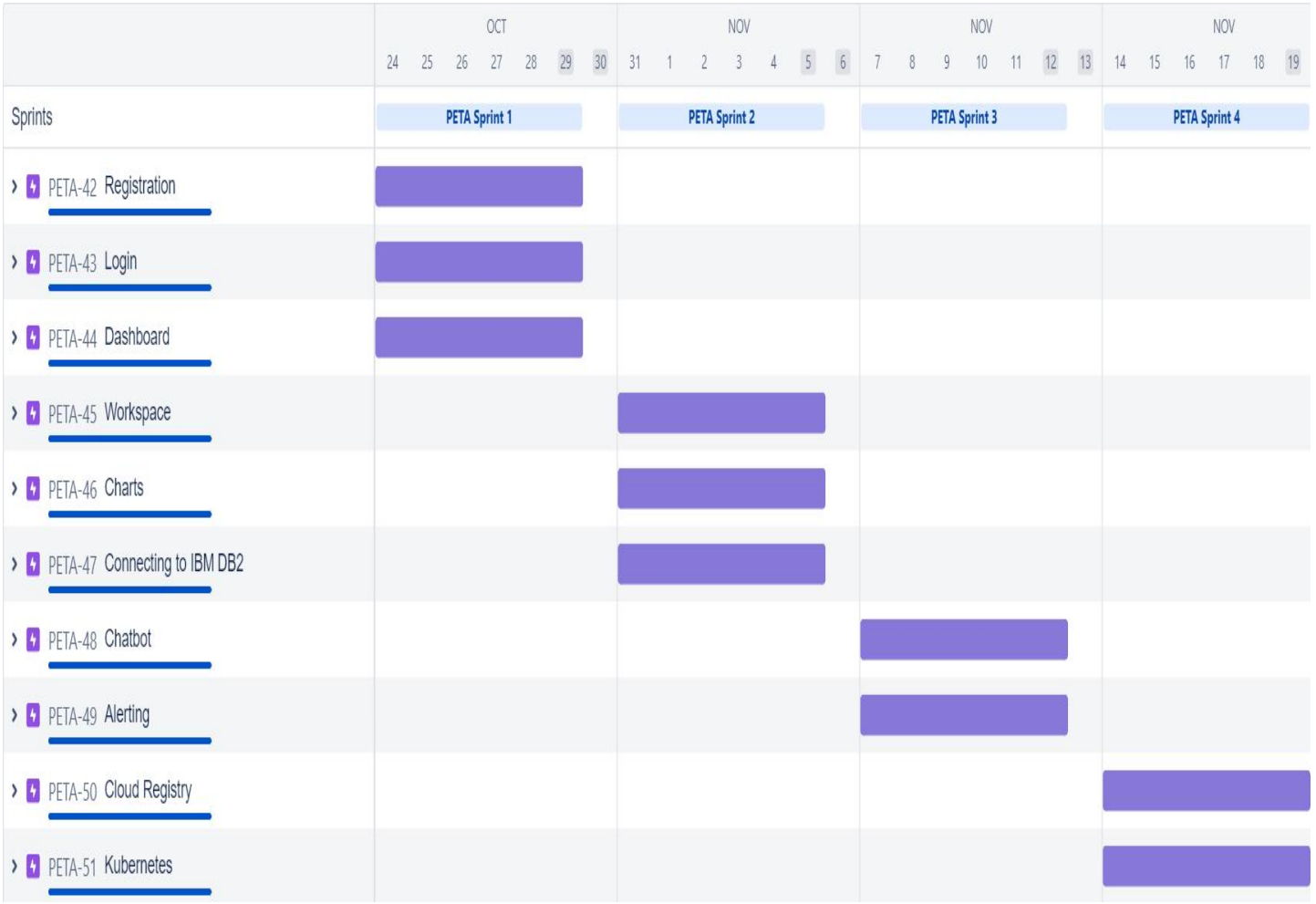
We have a 6-day sprint duration, and the velocity of the team is 20 (points per sprint).

Calculating the team's average velocity (AV) per iterationunit (story points per day)

Velocity (v) = sprint duration / velocity = 20/6 = 3.33(Approx…)

6.3 Reports from JIRA

Road Map



7. CODING AND SOLUTIONING

7.1 Feature - Add Expense

This feature allows the user to add an expense, it takes in the amount spent, the date of the expense, the category under which the expense falls and the group to which the expense belongs. It also takes an optional description for the expense.

7.2 Feature - Update Wallet

This feature allows the user to update the wallet amount. This is useful, for example to reflect the receiving of salary.

7.3 Feature - Dashboard

This allows the user to view the most recent expenses made. It displays each expense along with its details. It is also the home page which the user sees on logging in.

7.4 Feature - Rewards and Goals

This allows the user to specify certain goals regarding expenses, for example, to spend less than a certain amount over a certain period of time. The user can also specify a reward on completion of the goal.

7.5 Feature - Set Monthly Limit

This allows the user to set a limit on how much is spent in a given month. This can be changed. If the user's expenses exceeds the monthly limit, then a warning email is sent to the user.

7.6 Feature - Add Category

This feature allows the user to add his/her own categories. This allows for high customizability.

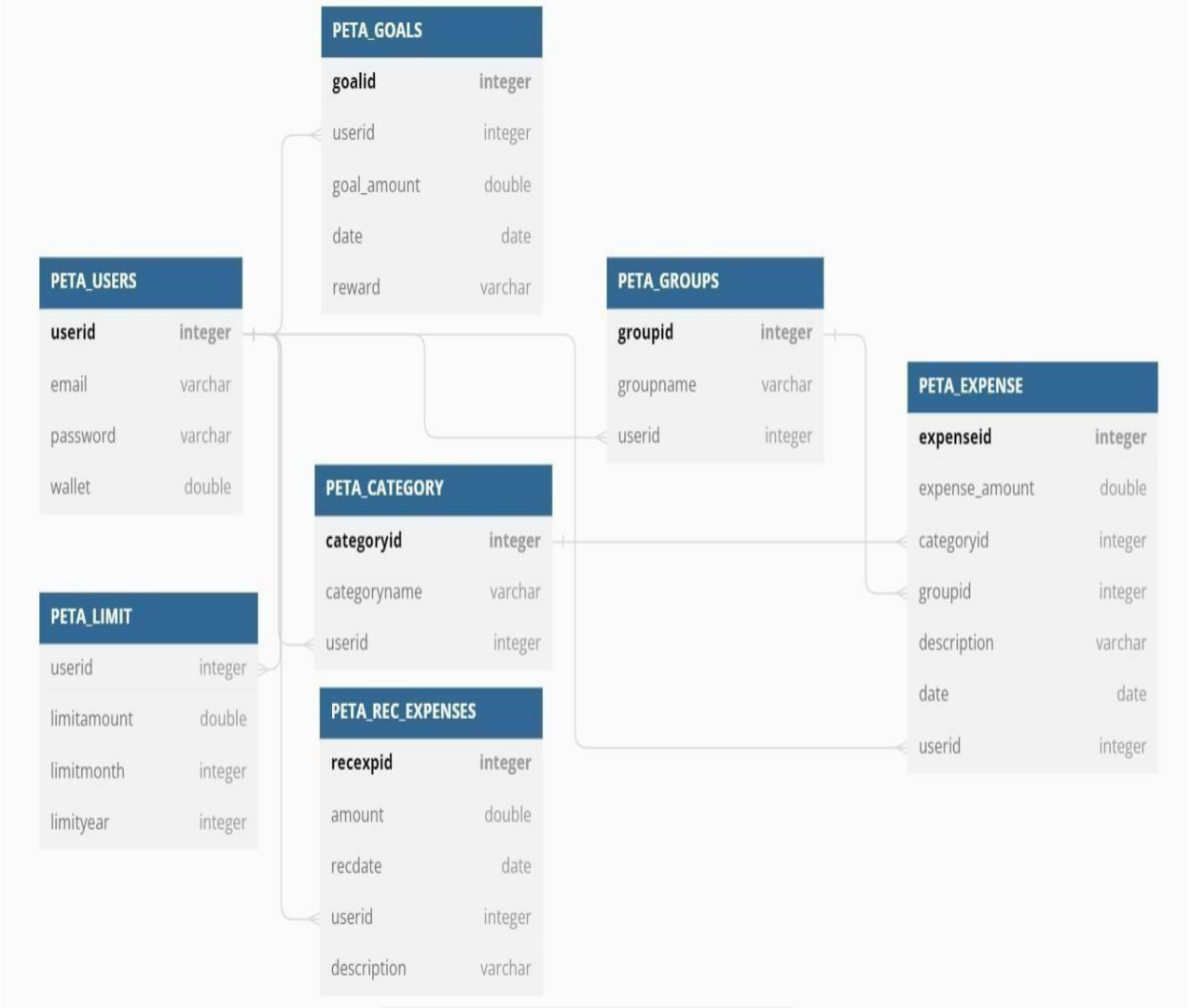
7.7 Feature - Analyse Expenses

This feature allows the user to view how much is spent in a given period of time, and other analyses based on the user's expenses.

7.8 Feature - Add Recurring/Periodic Expenses

This feature allows the user to add an expense that is recurring for every month. This is useful, for example, to model bills that need to be paid.

7.9 Database Schema



8. TESTING

8.1 Test Cases

- Verify that the user is able to login successfully on entering appropriate credentials.
- The UI elements, such as the card for the login, the button to submit etc are functional and are rendered properly in all devices.
- Users who enter invalid credentials will not be redirected to the dashboard
- Verify that users are able to register themselves to the application.
- The UI elements, such as the card for the registration, the button to submit etc are functional and are rendered properly in all devices.
- The user should not be able to register successfully if any of the fields are left empty.
- The user should receive the email from nunnaaarthi@gmail.com, stating a successfully registration.
- "The UI part of the dashboard,
- the side navbar, the logout option, the cards showing various expenses, and the wallet edit icon must be functioning and rendered properly"
- The UI part of the add expense page must be rendered and functioning.
- "The user must be able to
- add an expense. "
- The user should not be able to add the same expense again.
- The user should be able to update the balance and it must be reflected in the dashboard where the wallet balance is displayed.
- The user views all the UI components rendered properly and functioning accordingly.
- The user should be able to set a monthly limit for his expenditures.
- The page must render properly and function appropriately.
- The user must be able to view the analysis of their expenses.
- The UI which contains 2 graphs must be rendered properly.
- The user must be able to view the analysis of their expenses.
- The UI is rendered properly and the various components are functioning properly.
- The UI is rendered properly and the various components are functioning properly.
- This page allows the user to view the recurring expenses that he or she has created using the add recurring expense page.
- The user must be able to view their existing rewards and goals . They can also use

the add reward and goal icon to add the reward and goal.

- The user must be able to add a reward and goal.
- The user must be able to view their existing rewards and goals in a properly rendered manner.
- The user must be able view the UI components to add a goal in the appropriate manner.
- The user must be able to create a new category for themselves.
- The UI components of the add category page is rendered properly and functions appropriately.
- The user views the expense cards, and clicks on a particular card's edit icon to modify the expense
- The user views the expense cards displaying the expenses available to edit.

8.2 User Acceptance Testing

Defect Analysis

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	0	0	0	0	0
Duplicate	0	0	0	0	0
External	1	0	0	0	1
Fixed	0	2	0	0	2
Not Reproduced	0	0	0	0	0
Skipped	0	0	0	0	0
Won't Fix	0	0	0	0	0
Totals	1	2	0	0	3

Test case Analysis:

Section	Total Cases	Not Tested	Fail	Pass
Login	3	0	0	3
Registration	4	0	0	4
Dashboard	1	0	0	1
Expense Addition	3	0	1	2
Update Balance	2	0	0	2
Set monthly limit	2	0	0	2
View Analysis	3	0	1	2
Recurring Expense Addition	2	0	0	2
View Recurring Expense	2	0	0	2
Rewards and Goals	4	0	0	4
Category Creation	2	0	0	2
Modifying an Expense	2	0	0	2

9. RESULTS

9.1 Performance Metrics

NFT-Risk assessment:

S.No	Project Name	Scope/feature	Functional Changes	Hardware Changes
1	Personal Expense Tracker v1	New	High	No Changes
2	Personal Expense Tracker v2	Existing	Moderate	No Changes

Software Changes	Impact of Downtime	Load/Volume Changes
Moderate	Considerable time taken to insert into DB	No Changes
Moderate	Faster DB operations	No Changes

Risk Score	Justification
ORANGE	Adding this feature makes is coherant with features like adding group and hence, functional changes is high
ORANGE	Updated SQL statements for faster DB operations

NFT - Detailed Test Plan:

S.No	Project Overview	NFT Test approach	Assumptions/Dependencies/Risks
1	Personal Expense Tracker v1	Load testing	Locust installed, app deployed with docker
2	Personal Expense Tracker v2	Stress testing	Locust installed, app deployed with docker
3	Personal Expense Tracker v2	Spike testing	Locust installed, app deployed with docker
4	Personal Expense Tracker v2	Reliability testing	Locust installed, app deployed with docker

End Of Test Report:

S.No	Project Overview	NFT Test approach	NFR - Met
1	Personal Expense Tracker v1	Load testing	Failures
2	Personal Expense Tracker v2	Stress testing	Response time
3	Personal Expense Tracker v2	Spike testing	Response time
4	Personal Expense Tracker v2	Reliability testing	Number of failures

Test Outcome	GO/NO-GO decision
Number of failures spikes from 0.3 to 0.9 with increase in number of users from 70 to 100	GO
Increases from 3100ms for one user to 19000ms for 20 users	GO
Varies from minimum if 1367ms and maximum of 25609ms for a specific feature of adding expenses	GO
41% failures with adding expense with spike in user data and incorrect input values, but maintained average of 13000ms response time	GO

Recommendations	Identified Defects (Detected/Closed/Open)
Provide checks from input value before inserting into database	Bad request error on adding expense without primary, required rows
Provide checks from input value before inserting into database	internal server error on adding expense without primary, required rows

10. ADVANTAGES & DISADVANTAGES

Advantages

1. An added expense can also be modified. Hence an error that is made while adding an expense is easily rectified.
2. Rewards and goals may be used to motivate the user to spend less.
3. The expenses can be analysed to understand the patterns of expenditure.
4. Recurring expenses can be added to model bills and such.
5. Categories can be added for higher customizability.

Disadvantages

1. Complex analysis based on categories is not supported.
2. Limits cannot be imposed on arbitrary periods of time, but only on a single month.
3. Recurring expenses have a period of exactly one month, which is not customizable.
4. It requires the user to manually enter expense information accurately.
5. The user is the one who is responsible for rewarding himself on the completion of agoal.

11. CONCLUSION

A Personal Expense Tracker supporting myriad features has been designed and implemented using IBM's cloud based tools such as DB2, IBM Object Storage, etc. SendGrid is used to send mails to users. Docker and Kubernetes are used for deployment ofthe application.

12. FUTURE SCOPE

Future avenues of work in this application would include:

1. Design and implementation of complex analyses based on various parameters suchas categories, groups, etc.
2. Prediction of expenses based on machine learning.
3. Adding support for limits imposed on arbitrary periods of time.
4. Adding support for recurring expenses that have a user-specified period.
5. Having the application itself reward the user for accomplishment of various goals, such as coupons, vouchers, etc.

13. APPENDIX

13.1 Source Code

app.py

```
from flask import Flask, render_template, request, redirect, url_for
from flask_mail import Mail, Message
from datetime import datetime
from flask_cors import CORS, cross_origin
import ibm_db
import json
import plotly
import plotly.graph_objs as go
import pandas as pd
from flask import send_file
from io import BytesIO
import matplotlib.pyplot as plt
import numpy as np
import base64
from PIL import Image
import time
import atexit
from datetime import datetime
from apscheduler.schedulers.background import BackgroundScheduler

app = Flask(__name__, template_folder='templates')
app.config['SECRET_KEY'] = 'top-secret!'
app.config['MAIL_SERVER'] = 'smtp.sendgrid.net'
app.config['MAIL_PORT'] = 587
app.config['MAIL_USE_TLS'] = True
app.config['MAIL_USERNAME'] = 'apikey'
app.config['MAIL_PASSWORD'] =
'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'
app.config['MAIL_DEFAULT_SENDER'] = 'nunnaaarthi@gmail.com'
mail = Mail(app)
cors = CORS(app)
app.config['CORS_HEADERS'] = 'Content-Type'

# GLobal variables
EMAIL = ''
USERID = ''

conn =
ibm_db.connect("DATABASE=bludb;HOSTNAME=54a2f15b-5c0f-46df-8954-7e38e612c2
bd.c1ogj3sd0tgtu0lqde00.databases.appdomain.cloud;PORT=32733;Security=SSL;
SSLServerCertificate=DigiCertGlobalRootCA.crt;UID=nlg66799;PWD=CXtQLAGZ06f
D0fhC;", "", "")
```

```
# FUNCTIONS INTERACTING WITH DB #


def fetch_walletamount():
    sql = 'SELECT WALLET FROM PETA_USER WHERE EMAIL=?'
    stmt = ibm_db.prepare(conn, sql)
    ibm_db.bind_param(stmt, 1, EMAIL)
    ibm_db.execute(stmt)
    user = ibm_db.fetch_assoc(stmt)
    # print(user['WALLET'])
    return user['WALLET']  # returns int


def fetch_categories():

    sql = 'SELECT * FROM PETA_CATEGORY WHERE USERID = ?'
    stmt = ibm_db.prepare(conn, sql)
    ibm_db.bind_param(stmt, 1, USERID)
    ibm_db.execute(stmt)

    categories = []
    while ibm_db.fetch_row(stmt) != False:
        categories.append([ibm_db.result(stmt, "CATEGORYID"),
                           ibm_db.result(stmt, "CATEGORY_NAME")])

    sql = 'SELECT * FROM PETA_CATEGORY WHERE USERID IS NULL'
    stmt = ibm_db.prepare(conn, sql)
    ibm_db.execute(stmt)

    while ibm_db.fetch_row(stmt) != False:
        categories.append([ibm_db.result(stmt, "CATEGORYID"),
                           ibm_db.result(stmt, "CATEGORY_NAME")])

    # print(categories)
    return categories  # returns list


def fetch_userID():
    sql = 'SELECT USERID FROM PETA_USER WHERE EMAIL=?'
    stmt = ibm_db.prepare(conn, sql)
    ibm_db.bind_param(stmt, 1, EMAIL)
    ibm_db.execute(stmt)
    user = ibm_db.fetch_assoc(stmt)
    # print(user['USERID'])
    return user['USERID']  # returns int

def fetch_groups():
```

```
    sql = 'SELECT * FROM PETA_GROUPS'
    stmt = ibm_db.exec_immediate(conn, sql)
    groups = []
    while ibm_db.fetch_row(stmt) != False:
         groups.append([ibm_db.result(stmt, "GROUPID"),
                        ibm_db.result(stmt, "GROUPNAME")])
    # print(groups)
    return groups  # returns list


def fetch_expenses():
    sql = 'SELECT * FROM PETA_EXPENSE where USERID = ' + str(USERID)
    # print(sql)
    stmt = ibm_db.exec_immediate(conn, sql)
    expenses = []
    while ibm_db.fetch_row(stmt):
        category_id = ibm_db.result(stmt, "CATEGORYID")
        category_id = str(category_id)
        sql2 = "SELECT * FROM PETA_CATEGORY WHERE CATEGORYID = " +
category_id
        stmt2 = ibm_db.exec_immediate(conn, sql2)
        category_name = ""
        while ibm_db.fetch_row(stmt2) != False:
            category_name = ibm_db.result(stmt2, "CATEGORY_NAME")
        expenses.append([ibm_db.result(stmt, "EXPENSE_AMOUNT"),
ibm_db.result(
            stmt, "DATE"), ibm_db.result(stmt, "DESCRIPTION"),category_name])
    # print(expenses)
    return expenses


def fetch_rec_expenses_cron():
    sql = 'SELECT * FROM PETA_REC_EXPENSES;'
    stmt = ibm_db.exec_immediate(conn, sql)
    rec_expenses = []
    while ibm_db.fetch_row(stmt) != False:
        amt = ibm_db.result(stmt, "AMOUNT")
        amt = str(amt)
        description = ibm_db.result(stmt, "DESCRIPTION")
        userid = ibm_db.result(stmt, "USERID")
        date = ibm_db.result(stmt, "RECDATE")
        rec_expenses.append([amt, description, date, userid])
    # print(rec_expenses)
    return rec_expenses


def fetch_rec_expenses():
    sql = 'SELECT * FROM PETA_REC_EXPENSES WHERE USERID = ' + str(USERID)
    stmt = ibm_db.exec_immediate(conn, sql)
```

```
    rec_expenses = []
    while ibm_db.fetch_row(stmt) != False:
        amt = ibm_db.result(stmt, "AMOUNT")
        amt = str(amt)
        description = ibm_db.result(stmt, "DESCRIPTION")
        userid = ibm_db.result(stmt, "USERID")
        date = ibm_db.result(stmt, "RECDATE")
        rec_expenses.append([amt, description, date, userid])
    # print(rec_expenses)
    return rec_expenses


def fetch_limits():
    now = datetime.now()
    year = now.year

    limits = [0 for i in range(12)]

    sql = 'SELECT LIMITAMOUNT, LIMITMONTH FROM PETA_LIMIT WHERE USERID = ?
AND LIMITYEAR = ?'
    statement = execute_sql(sql, USERID, year)

    while ibm_db.fetch_row(statement):
        limit_amount = int(ibm_db.result(statement, 'LIMITAMOUNT'))
        limit_month = int(ibm_db.result(statement, 'LIMITMONTH'))
        limits[limit_month] = limit_amount

    return limits


# HELPER FUNCTIONS #
def fetch_latest_expenses(expenses):
    # must return expenses of last month
    latest_month = datetime.today().month
    latest_expenses = []
    for exp in expenses:
        if exp[1].month == latest_month:
            latest_expenses.append(exp)

    return latest_expenses


def fetch_monthly_expenses(expenses):
    latest_year = datetime.today().year
    monthly_expenses = {}

    for month in range(1, 13):
```

```
        monthly_expenses[month] = 0

    for exp in expenses:
        if exp[1].year == latest_year:
            monthly_expenses[exp[1].month] += exp[0]

    return monthly_expenses.values()


def draw_graph1(expenses):
    # TOTAL EXPENSE / DAY OF MONTH
    # x-axis: day , y-axis: expense/day

    latest_expenses = fetch_latest_expenses(expenses)
    mp = {}
    for day in range(1, 31):
        mp[day] = 0

    for exp in latest_expenses:
        mp[exp[1].day] += exp[0]

    x =  mp.keys()
    y = mp.values()

    # print(mp)

    plt.figure()
    plt.title('Expense recorded over the past month')
    plt.plot(x,  y)
    plt.xlabel('Day of the month')
    plt.ylabel('Recorded expense')
    plt.xlim(1, 32)

    buffer = BytesIO()
    plt.savefig(buffer, format='png')

    encoded_img_data = base64.b64encode(buffer.getvalue())

    return encoded_img_data


def draw_graph2(expenses, limits):
    # limit/month vs expense/month -> 2 line graphs

    monthly_expenses = fetch_monthly_expenses(expenses)
    x = range(1, 13)
    y1 = limits
```

```
    y2 = monthly_expenses

    plt.figure()
    plt.title('Month-wise comparison of limit and expense')plt.plot(x,
    y1, label="Limit/month")
    plt.plot(x, y2, label="Expenses/month")
    plt.xlabel('Month')
    plt.legend()

    buffer = BytesIO()
    plt.savefig(buffer, format='png')

    encoded_img_data = base64.b64encode(buffer.getvalue())

    return encoded_img_data

# finds the category id that matches that of the recurring expense
category


def  fetch_recurring_category_id():
    categories = fetch_categories()
    for category in categories:
        p = ''
        for i in category[1]:
            if (i == ' '):
                break
            p += i
        category[1] = p
    print(categories)
    categoryid = -1
    for category in categories:
        if category[1] == 'recurring':
            categoryid = category[0]
    print(categoryid)
    return categoryid


# cron to autodeduct the expenses each day
def auto_renew():
    global USERID
    # print(time.strftime("%A, %d. %B %Y %I:%M:%S %p"))
    rec_expenses = fetch_rec_expenses_cron()
    print(rec_expenses)
    current_day = time.strftime("%d")
    print(current_day)
    for expense in rec_expenses:
```

```
        here = str(expense[2])
        here = here.split('-')
        here = here[2]
        print(here)
        if (here == current_day):
            sql = "INSERT INTO PETA_EXPENSE(USERID, EXPENSE_AMOUNT,
CATEGORYID, DESCRIPTION, DATE) VALUES(?,?,?,?,?);"
            USERID = str(expense[3])
            categoryid = fetch_recurring_category_id()
            print(categoryid)
            stmt = ibm_db.prepare(conn, sql)
            ibm_db.bind_param(stmt, 1, expense[3])
            ibm_db.bind_param(stmt, 2, expense[0])
            ibm_db.bind_param(stmt, 3, categoryid)
            ibm_db.bind_param(stmt, 4, expense[1])
            d3 = time.strftime("%Y-%m-%d")
            ibm_db.bind_param(stmt, 5, d3)
            print(d3, categoryid, expense[0],
                  expense[1], expense[2], expense[3])ibm_db.execute(stmt)

            check_monthly_limit(datetime.now().month, datetime.now().year)
            # print(here, d3, expense[0], expense[1], expense[2])
            sql = "UPDATE PETA_USER SET WALLET = WALLET - ? WHERE USERID =
?"
            statement = ibm_db.prepare(conn, sql)
            print(USERID)
            ibm_db.bind_param(statement, 1, expense[0])
            ibm_db.bind_param(statement, 2, expense[3])
            print("deducted") ibm_db.execute(statement)


# caller code for the cron
scheduler = BackgroundScheduler()
scheduler.add_job(func=auto_renew, trigger="interval", seconds=3600 * 24)

# END POINTS #
scheduler.start()
atexit.register(lambda: scheduler.shutdown())


@app.route('/', methods=['GET', 'POST'])
@cross_origin()
def registration():
    global EMAIL
    print("hello")
```

```
    if request.method == 'GET':
        return render_template('registration.html')
    if request.method == 'POST':
        email = request.form['email']
        EMAIL = email
        password = request.form['password']
        wallet = request.form['wallet']
        sql = "INSERT INTO PETA_USER(EMAIL,PASSWORD,WALLET) VALUES(?,?,?)"
        stmt = ibm_db.prepare(conn, sql)
        ibm_db.bind_param(stmt, 1, email)
        ibm_db.bind_param(stmt, 2, password)
        ibm_db.bind_param(stmt, 3, wallet)
        print(stmt)
        ibm_db.execute(stmt)
        # msg = Message('Registration Verfication',recipients=[EMAIL])
        # msg.body = ('Congratulations! Welcome user!')
        # msg.html = ('<h1>Registration Verfication</h1>'
        #             '<p>Congratulations! Welcome user!'
        #             '<b>PETA</b>!</p>')
        # mail.send(msg)
        EMAIL = email
    return redirect(url_for('dashboard'))


@app.route('/login', methods=['GET', 'POST'])
def login():
    global EMAIL
    print("login")
    if request.method == 'POST':
        email = request.form['email']
        EMAIL = email
        print(EMAIL)
        password = request.form['password']
        sql = "SELECT * FROM PETA_USER WHERE email=? AND password=?"
        stmt = ibm_db.prepare(conn, sql)
        ibm_db.bind_param(stmt, 1, email)
        ibm_db.bind_param(stmt, 2, password)ibm_db.execute(stmt)
        account = ibm_db.fetch_assoc(stmt)
        if account:
            return redirect(url_for('dashboard'))
        else:
            return redirect(url_for('login'))
    elif request.method == 'GET':
        return render_template('login.html')
```

```
@app.route('/logout', methods=['GET'])
def logout():
    if request.method == 'GET':
        global USERID
        global EMAIL
        USERID = ""
        EMAIL = ""
        return redirect(url_for('login'))


@app.route('/dashboard', methods=['GET'])
def dashboard():
    global USERID
    global EMAIL
    print("dashboard")
    if USERID == '' and EMAIL == '':
        print("null email")
        return render_template('login.html')
    elif USERID == '':
        USERID = fetch_userID()
        print(USERID)

    sql = "SELECT EXPENSEID, EXPENSE_AMOUNT, DESCRIPTION, CATEGORY_NAME,
DATE FROM PETA_EXPENSE, PETA_CATEGORY WHERE PETA_EXPENSE.USERID = ? AND
PETA_EXPENSE.CATEGORYID = PETA_CATEGORY.CATEGORYID"
    statement = execute_sql(sql, USERID)

    expenses = []
    while True:
        expense = ibm_db.fetch_assoc(statement)
        if expense:
            expenses.append(expense)
        else:
            break

    wallet = fetch_walletamount()
    return render_template('dashboard.html', expenses=expenses,wallet=wallet,
email=EMAIL)


@app.route('/updatebalance', methods=['GET', 'POST'])
def update_balance():
    if request.method == 'GET':
        wallet = fetch_walletamount()
        return render_template('updatebalance.html', wallet=wallet)
    elif request.method == 'POST':
        global EMAIL
```

```
        global USERID
        if EMAIL == '':
            return render_template('login.html', msg='Login before
proceeding')
        if (USERID == ''):
            # get user using email
            USERID = fetch_userID()

        new_balance = request.form['balanceupdated']
        sql = 'UPDATE PETA_USER SET WALLET = ? WHERE USERID = ?'
        stmt = ibm_db.prepare(conn, sql)
        ibm_db.bind_param(stmt, 1, new_balance)
        ibm_db.bind_param(stmt, 2, USERID)
        ibm_db.execute(stmt)

        return redirect(url_for('dashboard'))


@app.route('/addcategory', methods=['GET', 'POST'])
def add_category():
    if request.method == 'GET':
        # categories = fetch_categories()
        return render_template('addcategory.html')

    elif request.method ==  'POST':
        categoryname = request.form['category']
        sql = 'INSERT INTO PETA_CATEGORY(CATEGORY_NAME, USERID)
VALUES(?,?)'
        stmt = ibm_db.prepare(conn, sql)
        ibm_db.bind_param(stmt, 1, categoryname)
        ibm_db.bind_param(stmt, 2, USERID)
        ibm_db.execute(stmt)

        return redirect(url_for('dashboard'))


@app.route('/addgroup', methods=['POST'])
def add_group():
    if request.method == 'POST':
        if USERID == '':
            return render_template('login.html', msg='Login before
proceeding')
        sql = "INSERT INTO PETA_GROUPS(GROUPNAME, USERID) VALUES(?,?)"
        stmt = ibm_db.prepare(conn, sql)
        ibm_db.bind_param(stmt, 1, request.form['groupname'])
        ibm_db.bind_param(stmt, 2, USERID)
        ibm_db.execute(stmt)
```

```
        group_info = {}

        sql = "SELECT * FROM PETA_GROUPS WHERE GROUPNAME=?"
        stmt = ibm_db.prepare(conn, sql)
        ibm_db.bind_param(stmt, 1, request.form['groupname'])
        ibm_db.execute(stmt)
        group_info = ibm_db.fetch_assoc(stmt)
        return {"groupID": group_info['GROUPID'], 'groupname':group_info['GROUPNAME']}


@app.route('/addexpense', methods=['GET', 'POST'])
def add_expense():
    if request.method == 'GET':
        groups = fetch_groups()
        categories = fetch_categories()
        if len(categories) == 0:
            return redirect(url_for('add_category'))
        return render_template('addexpense.html', categories=categories,
groups=groups)

    elif request.method == 'POST':
        global EMAIL
        global USERID
        if EMAIL == '':
            return render_template('login.html', msg='Login before
proceeding')
        if (USERID == ''):
            # get user using email
            USERID = fetch_userID()

        amount_spent = request.form['amountspent']
        category_id = request.form.get('category')
        description = request.form.get('description')
        date = request.form['date']

        groupid = request.form.get('group')
        groupid = None if groupid == '' else groupid

        print(amount_spent, category_id, description, date, groupid,
USERID)

        sql = "INSERT INTO PETA_EXPENSE(USERID, EXPENSE_AMOUNT,CATEGORYID,
GROUPID, DESCRIPTION, DATE) VALUES(?,?,?,?,?,?)"
        stmt = ibm_db.prepare(conn, sql)
        ibm_db.bind_param(stmt, 1, USERID)
```

```
        ibm_db.bind_param(stmt, 2, amount_spent)
        ibm_db.bind_param(stmt, 3, category_id)
        ibm_db.bind_param(stmt, 4, groupid)
        ibm_db.bind_param(stmt, 5, description)
        ibm_db.bind_param(stmt, 6, date)
        ibm_db.execute(stmt)
        print(date, amount_spent, category_id)
        sql = "UPDATE PETA_USER SET WALLET = WALLET - ? WHERE USERID = ?"
        statement = ibm_db.prepare(conn, sql)
        ibm_db.bind_param(statement, 1, amount_spent)
        ibm_db.bind_param(statement, 2, USERID)
        ibm_db.execute(statement)

        return redirect(url_for('dashboard'))


@app.route('/viewrecurring', methods=['GET'])
def viewrecurring():
    global USERID
    global EMAIL
    print("viewrecurring")
    if USERID == '' and EMAIL == '':
        print("null email")
        return render_template('login.html')
    elif USERID == '':
        USERID = fetch_userID()
        # print(USERID)
    print(USERID)
    expenses = fetch_rec_expenses()
    wallet = fetch_walletamount()
    return render_template('viewrecurring.html', expenses=expenses,
wallet=wallet, email=EMAIL)


@app.route('/recurringexpense', methods=['GET', 'POST'])
def recurring_expense():
    global USERID, EMAIL
    if request.method == 'GET':
        groups = fetch_groups()
        categories = fetch_categories()
        if len(categories) == 0:
            return redirect(url_for('add_category'))
        USERID = fetch_userID()
        # check if user has added a category for recurring category, if
not redirect and ask her to
        recur_id = fetch_recurring_category_id()
        if (recur_id == -1):
```

```
            return (redirect(url_for('add_category')))
        return render_template('recurringexpense.html',
categories=categories, groups=groups)

    elif request.method == 'POST':
        if EMAIL == '':
            return render_template('login.html', msg='Login before
proceeding')
        if (USERID == ''):
            # get user using email
            USERID = fetch_userID()
            # check if user has added a category for recurring category,
if not redirect and ask her to
            recur_id = fetch_recurring_category_id()
            if (recur_id == -1):
                return (redirect(url_for('add_category')))
        amount_spent = request.form['amountspent']
        category_id = request.form.get('category')
        description = request.form['description']
        date = request.form['date']
        # months = request.form['autorenewals']
        # groupid = request.form.get('group')
        print("recurring : ")
        print(amount_spent, description, date, USERID)

        sql = "INSERT INTO PETA_REC_EXPENSES(AMOUNT, RECDATE, USERID,
DESCRIPTION) VALUES (?,?,?,?)"
        stmt = ibm_db.prepare(conn, sql)
        ibm_db.bind_param(stmt, 1, amount_spent)
        ibm_db.bind_param(stmt, 2, date)
        ibm_db.bind_param(stmt, 3, USERID)
        ibm_db.bind_param(stmt, 4, description)
        ibm_db.execute(stmt)

        sql = "INSERT INTO PETA_EXPENSE(USERID, EXPENSE_AMOUNT,CATEGORYID,DESCRIPTION,
DATE) VALUES(?,?,?,?,?)"
        stmt = ibm_db.prepare(conn, sql)
        ibm_db.bind_param(stmt, 1, USERID)
        ibm_db.bind_param(stmt, 2, amount_spent)
        ibm_db.bind_param(stmt, 3, category_id)
        ibm_db.bind_param(stmt, 4, description)
        ibm_db.bind_param(stmt, 5, date)
        ibm_db.execute(stmt)

        sql = "UPDATE PETA_USER SET WALLET = WALLET - ? WHERE USERID = ?;"
        statement = ibm_db.prepare(conn, sql)
        ibm_db.bind_param(statement, 1, amount_spent)
```

```
        ibm_db.bind_param(statement, 2, USERID)
        ibm_db.execute(statement)

        return redirect(url_for('dashboard'))


@app.route('/removerecurring', methods=['POST'])
def remove_recurring():
    print("remove  recurring")
    if request.method == 'POST':
        global EMAIL
        global USERID
        if EMAIL == '':
            return render_template('login.html', msg='Login before
proceeding')
        if (USERID == ''):
            # get user using email
            USERID = fetch_userID()
        description = request.form['description']
        print(description, USERID)
        sql = 'DELETE FROM PETA_REC_EXPENSES WHERE USERID = ? AND
DESCRIPTION = ?;'
        stmt = ibm_db.prepare(conn, sql)
        ibm_db.bind_param(stmt, 1, USERID)
        ibm_db.bind_param(stmt, 2, description)
        ibm_db.execute(stmt)

        return redirect(url_for('dashboard'))


@app.route('/analysis', methods=['GET', 'POST'])
def analyse():
    if request.method == 'GET':
        expenses = fetch_expenses()
        limits = fetch_limits()

        graph1 = draw_graph1(expenses=expenses)
        graph2 = draw_graph2(expenses=expenses, limits=limits)

        return render_template("analysis.html",
img_data1=graph1.decode('utf-8'), img_data2=graph2.decode('utf-8'))

    elif request.method == 'POST':
        return render_template('analysis.html')


def execute_sql(sql, *args):
```

```
    stmt = ibm_db.prepare(conn, sql)
    for i, arg in enumerate(args):
        ibm_db.bind_param(stmt, i + 1, arg)
    ibm_db.execute(stmt)
    return stmt


def check_monthly_limit(month, year):
    sql = 'SELECT SUM(EXPENSE_AMOUNT) FROM PETA_EXPENSE WHERE USERID = ?
AND MONTH(DATE) = ? AND YEAR(DATE) = ?'
    statement = execute_sql(sql, USERID, month, year)
    amt_spent = ibm_db.fetch_tuple(statement)

    sql = 'SELECT LIMITAMOUNT FROM PETA_LIMIT WHERE USERID = ? AND
LIMITMONTH = ? AND LIMITYEAR = ?'
    statement = execute_sql(sql, USERID, month, year)
    monthly_limit = ibm_db.fetch_tuple(statement)

    if amt_spent and monthly_limit and int(amt_spent[0]) >
int(monthly_limit[0]):
        diff = int(amt_spent[0]) - int(monthly_limit[0])
        msg = Message('Monthly limit exceeded', recipients=[EMAIL])
        msg.body = (
            f'Monthly limit exceeded by {diff} for the month of {month},
{year}')
        mail.send(msg)


def update_monthly_limit(monthly_limit, month, year):
    sql = 'SELECT LIMITAMOUNT FROM PETA_LIMIT WHERE USERID = ? AND
LIMITMONTH = ? AND LIMITYEAR = ?'
    statement = execute_sql(sql, USERID, month, year)

    if ibm_db.fetch_row(statement):
        sql = 'UPDATE PETA_LIMIT SET LIMITAMOUNT = ? WHERE USERID = ? AND
LIMITMONTH = ? AND LIMITYEAR = ?'
        execute_sql(sql, monthly_limit, USERID, month, year)
    else:
        sql = 'INSERT INTO PETA_LIMIT VALUES(?, ?, ?, ?)'
        execute_sql(sql, USERID, monthly_limit, month, year)check_monthly_limit(month,

    year)


@app.route('/setmonthlylimit', methods=['GET', 'POST'])
def set_monthly_limit():
    if request.method == 'GET':
```

```
        return render_template('setmonthlylimit.html')
    elif request.method == 'POST':
        new_monthly_limit = request.form['monthlylimit']
        now = datetime.now()
        update_monthly_limit(new_monthly_limit, now.month, now.year)
        return redirect(url_for('dashboard'))


@app.route('/modifyexpense', methods=['GET', 'POST'])
def modify_expense():
    if request.method == 'GET':
        expenseid = request.args.get('expenseid')
        sql = "SELECT * FROM PETA_EXPENSE WHERE EXPENSEID = ?"
        statement = execute_sql(sql, expenseid)
        expense = ibm_db.fetch_assoc(statement)
        categories = fetch_categories()
        groups = fetch_groups()
        return render_template('modifyexpense.html', expense=expense,
categories=categories, groups=groups)
    elif request.method == 'POST':
        amount_spent = request.form['amountspent']
        category_id = request.form.get('category')
        description = request.form['description']
        date = request.form['date']
        groupid = request.form.get('group')

        expenseid = request.form['expenseid']
        old_amount_spent = request.form['oldamountspent']

        sql = "UPDATE PETA_EXPENSE SET EXPENSE_AMOUNT = ?, CATEGORYID = ?,
GROUPID = ?, DESCRIPTION = ?, DATE = ? WHERE EXPENSEID = ?"
        execute_sql(sql, amount_spent, category_id,
                    groupid, description, date, expenseid)

        sql = "UPDATE PETA_USER SET WALLET = WALLET + ?"
        execute_sql(sql, float(old_amount_spent) - float(amount_spent))

        return redirect(url_for('dashboard'))


def fetch_goals():
    sql = 'SELECT * FROM PETA_GOALS WHERE USERID = ?'
    statement = execute_sql(sql, USERID)

    goals = []
    while True:
        goal = ibm_db.fetch_tuple(statement)
```

```
        if goal:
            goals.append(goal[2:])
        else:
            break

    print(goals)
    return goals


@app.route('/rewards', methods=['GET'])
def rewards_and_goals():
    goals = fetch_goals()
    return render_template('rewards.html', goals=goals)


@app.route('/addgoal', methods=['GET', 'POST'])
def add_goal():
    if request.method == 'GET':
        return render_template('addgoal.html')
    elif request.method == 'POST':
        goal_amount = request.form['goal_amount']
        date = request.form['date']
        reward = request.form['reward']
        sql = "INSERT INTO PETA_GOALS(USERID, GOAL_AMOUNT, DATE, REWARD)
VALUES(?, ?, ?, ?)"
        execute_sql(sql, USERID, goal_amount, date, reward)
        return redirect(url_for('dashboard'))


def check_goals():
    sql = "SELECT A.GOALID, A.USERID, A.GOAL_AMOUNT, A.DATE, A.REWARD,
B.WALLET FROM PETA_GOALS AS A, PETA_USER AS B WHERE A.USERID = B.USERID"
    statement = execute_sql(sql)

    now = datetime.now()
    while True:
        row = ibm_db.fetch_assoc(statement)
        if not row:
            break
        if row['DATE'] == now:
            if row['GOAL_AMOUNT'] <= row['WALLET']:
                msg = Message('Goal achieved!', recipients=[EMAIL])
                msg.body = (
                    f'You are eligible for your reward:\n{row["REWARD"]}')
                mail.send(msg)
            else:
                msg = Message('Goal limit exceeded', recipients=[EMAIL])
```

```
                msg.body = (
                    f'You are not eligible for the
reward:\n{row["REWARD"]}\nBetter luck next time!')
                mail.send(msg)
            sql = "DELETE FROM PETA_GOALS WHERE GOALID = ?"
            execute_sql(sql, row['GOALID'])


scheduler.add_job(func=check_goals, trigger="interval", seconds=3600 * 24)

if__name__== '_main_':
    app.run(host='0.0.0.0', debug=True)
```

base_template.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <!-- Required meta tags -->
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1">

    <!-- Bootstrap CSS -->
    <link
href="https://cdn.jsdelivr.net/npm/bootstrap@5.0.2/dist/css/bootstrap.min.
css" rel="stylesheet"
integrity="sha384-EVSTQN3/azprG1Anm3QDgpJLIm9Nao0Yz1ztcQTwFspd3yD65Vohhpuu
COmLASjC" crossorigin="anonymous">

    <!-- bootstrap for the cards -->
    <link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/css/bootstrap.min.
css"
integrity="sha384-Gn5384xqQ1aoWXA+058RXPxPg6fy4IWvTNh0E263XmFcJlSAwiGgFAW/
dAiS6JXm" crossorigin="anonymous">

    <script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.0.2/dist/js/bootstrap.bundle
.min.js"
integrity="sha384-MrcW6ZMFYlzcLA8Nl+NtUVF0sA7MsXsP1UyJoMp4YLEuNSfAP+JcXn/t
WtIaxVXM" crossorigin="anonymous"></script>

    {% block title %}
        <title>Base Template</title>
    {% endblock title %}
</head>
```

```
<body>
    <div class="container-fluid">
        <div class="row flex-nowrap">
            <div class="col-auto col-md-3 col-xl-2 px-sm-2 px-0"
style="background-color: #B2D3C2">
                <div class="d-flex flex-column align-items-center
align-items-sm-start px-3 pt-2 min-vh-100" style="color:black">
                    <p class="d-flex align-items-center pb-3 mb-md-0
me-md-auto text-white text-decoration-none">
                        <span class="fs-5 d-none d-sm-inline"
style="color:black; font-weight: bold;">Personal Expense Tracker</span>
                        <img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/piggybank.png" style="width:50px;height: 50px;">
                    </p>
                    <ul class="nav nav-pills flex-column mb-sm-auto mb-0
align-items-center align-items-sm-start" id="menu">
                        <li class="nav-item mt-2" style="background-color:
{{'#00AD83' if highlight == 'dashboard'}}; height: 50px; width: 150px;
border-radius: 5px;">
                            <a href="dashboard" class="nav-link
align-middle px-0" style="color:black;">
                                <img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/house-outline.svg"  style="width:20px;height:20px;margin-left:
5px;">
                                <span class="ms-1 d-none
d-sm-inline">Home</span>
                            </a>
                        </li>

                        <li class="nav-item mt-2" style="background-color:
{{'#00AD83' if highlight == 'addexpense'}};">
                            <a href="addexpense" class="nav-link px-0
align-middle" style="color:black;">
                                <img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/pay-15.png" style="width:20px;height:20px;margin-left: 5px;">
                                <span class="ms-1 d-none d-sm-inline">Add
Expense</span>
                            </a>
                        </li>

                        <li class="nav-item mt-2" style="background-color:
{{'#00AD83' if highlight == 'recurringexpense'}};">
                            <a href="recurringexpense" class="nav-link
px-0 align-middle" style="color:black;">
```

```
                                <img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/pay-15.png" style="width:20px;height:20px;margin-left: 5px;">
                                <span class="ms-1 d-none
d-sm-inline">Initiate a recurring expense</span>
                            </a>
                        </li>

                        <!-- <li class="nav-item mt-2"
style="background-color: {{'#00AD83' if highlight == 'modifyexpense'}};">
                            <a href="modifyexpense" class="nav-link px-0
align-middle" style="color:black;">
                                <img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/edit_icon.svg" style="width:20px;height:20px;margin-left:
5px;">
                                <span class="ms-1 d-none
d-sm-inline">Modify Expense</span>
                            </a>
                        </li> -->

                        <li class="nav-item mt-2" style="background-color:
{{'#00AD83' if highlight == 'viewrecurring'}};">
                            <a href="viewrecurring" class="nav-link px-0
align-middle" style="color:black;">
                                <img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
 etrackercapd/graph.png" style="width:20px;height:20px;margin-left: 5px;">
                                 <span class="ms-1 d-none d-sm-inline">View
recurring expenses</span>
                            </a>
                        </li>

                        <li class="nav-item mt-2" style="background-color:
{{'#00AD83' if highlight == 'analysis'}};">
                            <a href="analysis" class="nav-link px-0
align-middle" style="color:black;">
                                <img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
 etrackercapd/graph.png" style="width:20px;height:20px;margin-left: 5px;">
                                 <span class="ms-1 d-none d-sm-inline">View
Analysis</span>
                            </a>
                        </li>

                        <li class="nav-item mt-2" style="background-color:
{{'#00AD83' if highlight == 'rewards'}};">
```

```
                            <a href="rewards" class="nav-link px-0
align-middle" style="color:black;">
                                <img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/reward.png" style="width:20px;height:20px;margin-left: 5px;">
                                <span class="ms-1 d-none
d-sm-inline">Rewards & Goals</span>
                            </a>
                        </li>

                        <li class="nav-item mt-2" style="background-color:
{{'#00AD83' if highlight == 'addcategory'}};">
                            <a href="addcategory" class="nav-link px-0
align-middle" style="color:black;">
                                <img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/category_add.webp"  style="width:20px;height:20px;margin-left:
5px;">
                                <span class="ms-1 d-none
d-sm-inline">Create category</span>
                            </a>
                        </li>

                        <li class="nav-item mt-2" style="background-color:
{{'#00AD83' if highlight == 'setmonthlylimit'}};">
                            <a href="setmonthlylimit" class="nav-link px-0
align-middle" style="color:black;">
                                <img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/category_add.webp"  style="width:20px;height:20px;margin-left:
5px;">
                                <span class="ms-1 d-none d-sm-inline">Set
Monthly Limit</span>
                            </a>
                        </li>
                    </ul>

                    <ul class="nav nav-pills flex-column mb-sm-auto mb-0
align-items-center align-items-sm-end" id="menu">
                        <li class="nav-item mt-2">
                            <a href="logout" class="nav-link px-0
align-middle" style="color:black;">
                                <img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/log-out.png" style="width:20px;height:20px;margin-left:
5px;">
```

```
                                <span class="ms-1 d-none d-sm-inline">Log
Out</span>
                            </a>
                        </li>
                    </ul>

                </div>
            </div>
            {% block content %}
                <h1>This needs to be overriden</h1>
            {% endblock content %}
        </div>
    </div>

    {% block script %}
    <script></script>
    {% endblock script %}
</body>
</html>
```

addcategory.html

```
{% extends 'base_template.html' %}

{% block title %}
<title>Add Category</title>
{% endblock title %}

{% set highlight = 'addcategory' %}

{% block content %}
<div class="col py-3" style="background-color:#00AD83">
    <h3 style="color:white; text-align: center;">Add category</h3>
    <div class="container mt-3" style="width: 600px;">
        <div class="card shadow-lg bg-white rounded">
            <form action="/addcategory" method="POST">
                <div class="card-header" style="text-align: center;">
                    <span style="display:inline-flex"><h4>New
Category</h4><img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/category_add.webp" style=" margin-left:10px; width:30px;
height:30px"></span>
                    <span style="display:inline-flex"><h5>Include a
category called 'recurring' if you want to use recurring
expenses</h5></span>

                </div>
```

```
                <div class="card-body">
                        <div class="mb-3">
                        <label for="category" class="form-label">Category
Name: </label>
                        <input type="text" class="form-control"
name="category" id="category"></input>
                        </div>
                        <div class="mb-3">
                        <label for="description"
class="form-label">Description of Category: </label>
                        <input type="text" class="form-control"
name="description" id="description"></input>
                        </div>
                </div>
                <div class="card-footer text-muted"
style="text-align:center">
                    <button type="submit" style="background-color:#00AD83;
border-color:#00AD83; border-radius:5px;">Add category</button>
                </div>
            </form>
        </div>
    </div>
</div>
{% endblock content %}
```

addexpense.html

```
{% extends 'base_template.html' %}

{% block title %}
<title>Add Expense</title>
{% endblock title %}

{% set highlight = 'addexpense' %}

{% block content %}
<div class="col py-3" style="background-color:#00AD83">
    <h3 style="color:white; text-align: center;">Add expense</h3>
    <div class="container mt-3" style="width: 600px;">
         <div class="card shadow-lg bg-white rounded">
             <form action="/addexpense" method="POST">
                 <div class="card-header" style="text-align: center;">
                     <span style="display:inline-flex"><h4>Expense
Made</h4><img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/pay-15.png" style=" margin-left:10px; width:30px;
height:30px"></span>
```

```
                </div>
                <div class="card-body">
                    <div class="mb-3">
                        <label for="amountspent" class="form-label">Amount
Spent: (Rs) </label>
                        <input type="number" class="form-control"
name="amountspent" id="amountspent" placeholder="100.00" required>
                    </div>
                    <div class="mb-3">
                        <label for="expensecategory"
class="form-label">Expense Category: </label>
                        <select name="category" id="category"
class="form-control" placeholder="Select a category" required>
                            <option value="">Select a category</option>
                            {% for cat in categories %}
                                <option value="{{ cat[0] }}">{{ cat[1]
}}</option>
                            {% endfor %}
                        </select>
                    </div>
                    <div class="mb-3">
                        <label for="date" class="form-label">Date of
Expense: </label>
                        <input type="date" class="form-control"
name="date" id="date" required></input>
                    </div>
                    <div class="mb-3">
                        <label for="description"
class="form-label">Description of Expense: </label>
                        <input type="text" class="form-control"
name="description" id="description"></input>
                    </div>
                    <div class="mb-3">
                        <label for="group" class="form-label">Group(if
needed): </label>
                        <div title="New group" style="float:right"
value="Create group" onclick="addGroup()">ADD GROUP</div>
                        <br/>

                        <select name="group" id="group"
class="form-control">
                            <option value="">Select existing
group</option>
                            {% for group in groups %}
                                <option value="{{ group[0] }}">{{ group[1]
}}</option>
                            {% endfor %}
```

```
                        </select>
                    </div>
                </div>
                <div class="card-footer text-muted"
style="text-align:center">
                    <button type="submit" value="submit"
style="background-color:#00AD83; border-color:#00AD83;
border-radius:5px;">Submit Expense</button>
                </div>
            </form>
        </div>
    </div>
</div>
{% endblock content %}

{% block script %}
<script>
    function addGroup(e) {
        // e.preventDefault();
        group = window.prompt('Enter group name: ')
        console.log('PROMPT WINDOW SHOWN'+group);

        const formData = new FormData();
        formData.append("groupname", group);

        const xhttp = new XMLHttpRequest();
        xhttp.onload = function() {
            if (this.readyState == 4 && this.status == 200)
                {var groupid= JSON.parse(this.responseText);
                console.log(groupid);
                // create option using DOM
                const newOption = document.createElement('option');
                const optionText =
document.createTextNode(groupid['groupname']);
                newOption.appendChild(optionText);
                newOption.setAttribute('value',groupid['groupID']);
                const selectDropdown = document.getElementById('group');
                selectDropdown.appendChild(newOption);
                console.log('GROUPID :'+ groupid['groupID']);
            }
        }
        xhttp.open("POST", "http://localhost:5000/addgroup");
        xhttp.send(formData);
    }
    document.querySelector('#date').valueAsDate = new Date();
</script>
{% endblock script %}
```

addgoal.html

```
{% extends 'base_template.html' %}

{% block title %}
<title>Add Goal and Reward</title>
{% endblock title %}

{% block content %}
<div class="col py-3" style="background-color:#00AD83">
    <h3 style="color:white; text-align: center;">Add Goal and Reward</h3>
    <div class="container mt-3" style="width: 600px;">
        <div class="card shadow-lg bg-white rounded">
            <form action="/addgoal" method="POST">
                <div class="card-header" style="text-align: center;">
                    <span style="display:inline-flex"><h4>Goal &
Reward</h4><img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/goal-icon.webp" style=" margin-left:10px; width:30px;
height:30px"></span>
                </div>
                <div class="card-body">
                    <div class="mb-3">
                        <label for="amountspent" class="form-label">Goal
Wallet Balance: (Rs) </label>
                        <input type="number" class="form-control"
name="goal_amount" id="goal_amount" placeholder="100.00" required>
                    </div>

                    <div class="mb-3">
                        <label for="date" class="form-label">Date of
Validity: </label>
                        <input type="date" class="form-control"
name="date" id="date" required></input>
                    </div>

                    <div class="mb-3">
                        <label for="description"
class="form-label">Reward: </label>
                        <input type="text" class="form-control"
name="reward" id="reward"></input>
                    </div>
                </div>
                <div class="card-footer text-muted"
style="text-align:center">
```

```
                    <button type="submit" value="submit"
style="background-color:#00AD83; border-color:#00AD83;
border-radius:5px;">Create Goal & Reward</button>
                </div>
            </form>
        </div>
    </div>
</div>
{% endblock content %}
```

analysis.html

```
{% extends 'base_template.html' %}

{% block title %}
<title>Analysis</title>
{% endblock title %}

{% set highlight = 'analysis' %}

{% block content %}
<div class="col-auto px-0 col-lg-10 col-md-6 col-sm-4">
  <div class="card min-vh-100" style="background-color: #00ad83">
    <h4 class="card-header">Analysis of my expenses</h4>
    <div class="card-body">
      <div class="row flex-nowrap">
        <div class="col col-lg-5 col-md-3 px-4" style="background-color:
#00ad83">
          <img
            id="picture"
            src="{{ img_data1 }}"
          />
        </div>
        <div class="col col-lg-5 col-md-3 px-4" style="background-color:
#00ad83">
          <img
            id="picture"
            src="{{ img_data2 }}"
          />
        </div>
      </div>
    </div>
  </div>
</div>
{% endblock content %}

{% block script %}
```

```
<script type="text/javascript">
  function generate_graph1() {}
</script>
{% endblock script %}
```

dashboard.html

```
{% extends 'base_template.html' %}

{% block title %}
<title>Dashboard</title>
{% endblock title %}

{% set highlight = 'dashboard' %}

{% block content %}
<div class="col py-3" style="background-color:#00AD83">
    <h4 style="color:red;">{{ msg }}</h4>
    <h3 style="color:black; text-align: center;">Welcome Back! {{ email
}}</h3>
    <div class="d-flex justify-content-end">
        <img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/wallet_money.webp"
            style="height: 30px; width:30px">
        <h4 style="margin-left:10px;">Wallet Balance: <span><h5
style="display:inline"><i>{{wallet}}</i></h5></span></h4>
        <a href="updatebalance"><img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/edit_pencil.png"
            style="margin-left:5px; height: 30px; width:30px"></a>
    </div>
    <h3>Here are your expenses:</h3>
    <div class="card-deck">
        {% for expense in expenses %}
        <div class="card shadow-lg bg-white rounded" style="margin:20px;width:20rem;
height:20rem;">
            <div class="card-header" style="text-align: center;">
                <h4>Expense {{loop.index}}</h4>
            </div>
            <div class="card-body">
                <h6 class="card-text">
                    Amount Spent:
                    <span style="color:#00AD83"> Rs
{{expense['EXPENSE_AMOUNT']}}</span>
                    <br><br>
                    Description:
```

```
                    <span
style="color:#00AD83">{{expense['DESCRIPTION']}}</span>
                    <br><br>
                    Category:
                    <span
style="color:#00AD83">{{expense['CATEGORY_NAME']}}</span>
                </h6>
                <a
href="/modifyexpense?expenseid={{expense['EXPENSEID']}}">Modify</a>
            </div>
            <div class="card-footer text-muted" style="text-align:center">
                <h6>Date on which Expense was made: <span
style="color:#00AD83">{{expense['DATE']}}</span></h6>
            </div>
        </div>
        {% endfor %}
    </div>

</div>
{% endblock content %}
```

login.html

```
<!doctype html>
<html lang="en">
  <head>
    <!-- Required meta tags -->
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width, initial-scale=1">

    <!-- Bootstrap CSS -->
    <link
href="https://cdn.jsdelivr.net/npm/bootstrap@5.0.2/dist/css/bootstrap.min.
css" rel="stylesheet"
integrity="sha384-EVSTQN3/azprG1Anm3QDgpJLIm9Nao0Yz1ztcQTwFspd3yD65Vohhpuu
COmLASjC" crossorigin="anonymous">

    <title>Login</title>
  </head>
    <script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.0.2/dist/js/bootstrap.bundle
.min.js"
integrity="sha384-MrcW6ZMFYlzcLA8Nl+NtUVF0sA7MsXsP1UyJoMp4YLEuNSfAP+JcXn/t
WtIaxVXM" crossorigin="anonymous"></script>

    <body style="background-color:#B2D3C2">
        <div class="container mt-3">
```

```
            <h1 style="color: black; text-align: center;">
                Personal Expense Tracker <img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/piggybank.png" style="width:50px;height: 50px;">
            </h1>
            <div class="container mt-5" style="width: 600px;">
              <h4>{{ msg }}</h4>
                    <div class="card shadow-lg bg-white rounded">
                        <div class="card-header" style="text-align:
center;">
                          <h4>Login</h4>
                        </div>
                        <div class="card-body">
                          <form action="/login" method="POST">
                            <div class="mb-3">
                                <label for="email"
class="form-label">Email: </label>
                                <input type="email" class="form-control"
name="email" id="email" placeholder="abc@gmail.com">
                            </div>
                            <div class="mb-3">
                              <label for="passowrd"
class="form-label">Password: </label>
                              <input type="password"
class="form-control" name="password" id="password"></input>
                            </div>
                            <button type="submit"
style="background-color:#00AD83; border-color:#00AD83;
border-radius:5px;">Login</button>
                          </form>
                        </div>
                        <div class="card-footer text-muted"
style="text-align:center">
                          New user? <span><a href="/">Register
Here</a></span>
                        </div>
                      </div>
            </div>
        </div>
  </body>
</html>
```

modifyexpense.html

```
{% extends 'base_template.html' %}

{% block title %}
<title>Modify Expense</title>
```

```
{% endblock title %}

{% block content %}
<div class="col py-3" style="background-color:#00AD83">
    <h3 style="color:white; text-align: center;">Modify expense</h3>
    <div class="container mt-3" style="width: 600px;">
        <div class="card shadow-lg bg-white rounded">
            <form action="/modifyexpense" method="POST">
                <div class="card-header" style="text-align: center;">
                    <span style="display:inline-flex">
                        <h4>Expense Made</h4>
                        <img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/pay-15.png" style=" margin-left:10px; width:30px;
height:30px">
                    </span>
                </div>
                <div class="card-body">
                    <div class="mb-3">
                        <label for="amountspent" class="form-label">Amount
Spent: (Rs) </label>
                        <input type="number" class="form-control"
name="amountspent" id="amountspent" placeholder="100.00"
value="{{expense['EXPENSE_AMOUNT']}}" required>
                    </div>

                    <div class="mb-3">
                        <label for="expensecategory"
class="form-label">Expense Category: </label>
                        <select name="category" id="category"
class="form-control" placeholder="Select a category">
                            <option value="">Select a category</option>
                            {% for category in categories %}
                                <option value="{{ category[0] }}"
{{'selected' if expense['CATEGORYID'] == category[0]}}>{{ category[1]
}}</option>
                            {% endfor %}
                        </select>
                    </div>

                    <div class="mb-3">
                        <label for="date" class="form-label">Date of
Expense: </label>
                        <input type="date" class="form-control"
name="date" id="date" value="{{expense['DATE']}}" required></input>
                    </div>
```

```
                    <div class="mb-3">
                        <label for="description"
class="form-label">Description of Expense: </label>
                        <input type="text" class="form-control"
name="description" id="description"
value="{{expense['DESCRIPTION']}}"></input>
                    </div>

                    <div class="mb-3">
                        <label for="group" class="form-label">Group(if
needed): </label>
                        <div title="New group" style="float:right"
value="Create group" onclick="addGroup()">ADD GROUP</div><br/>

                        <select name="group" id="group"
class="form-control">
                            <option value="">Select existing
group</option>
                            {% for group in groups %}
                                <option value="{{ group[0] }}"
{{'selected' if expense.get('GROUPID') and expense.get('GROUPID') ==
group[0]}}>{{ group[1] }}</option>
                            {% endfor %}
                        </select>
                    </div>

                    <input type="hidden" name="expenseid"
value="{{expense['EXPENSEID']}}" />
                    <input type="hidden" name="oldamountspent"
value="{{expense['EXPENSE_AMOUNT']}}" />
                </div>
                <div class="card-footer text-muted"
style="text-align:center">
                    <button type="submit" value="submit"
style="background-color:#00AD83; border-color:#00AD83;
border-radius:5px;">Submit Expense</button>
                </div>
            </form>
        </div>
    </div>
</div>
{% endblock content %}

{% block script %}
<script>
    function addGroup(e) {
        // e.preventDefault();
```

```
        group = window.prompt('Enter group name: ')
        console.log('PROMPT WINDOW SHOWN'+group);

        const formData = new FormData();
        formData.append("groupname", group);

        const xhttp = new XMLHttpRequest();
        xhttp.onload = function() {
            if (this.readyState == 4 && this.status == 200)
                {var groupid= JSON.parse(this.responseText);
                console.log(groupid);
                // create option using DOM
                const newOption = document.createElement('option');
                const optionText =
document.createTextNode(groupid['groupname']);
                newOption.appendChild(optionText);
                newOption.setAttribute('value',groupid['groupID']);
                const selectDropdown = document.getElementById('group');
                selectDropdown.appendChild(newOption);
                console.log('GROUPID :'+ groupid['groupID']);
            }
        }
        xhttp.open("POST", "http://localhost:5000/addgroup");
        xhttp.send(formData);
    }
</script>
{% endblock script %}
```

recurringexpense.html

```
{% extends 'base_template.html' %}

{% block title %}
<title>Recurring Expense</title>
{% endblock title %}

{% set highlight = 'recurringexpense' %}

{% block content %}
<div class="col py-3" style="background-color:#00AD83">
    <h3 style="color:white; text-align: center;">Add Recurring
Expense</h3>
    <div class="container mt-3" style="width: 600px;">
        <div class="card shadow-lg bg-white rounded">
            <form action="/recurringexpense" method="POST">
                <div class="card-header" style="text-align: center;">
```

```
                    <span style="display:inline-flex"><h4>Expense
Made</h4><img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/pay-15.png" style=" margin-left:10px; width:30px;
height:30px"></span>
                </div>
                <div class="card-body">
                    <div class="mb-3">
                        <label for="amountspent" class="form-label">Amount
Spent: (Rs) </label>
                        <input type="number" class="form-control"
name="amountspent" id="amountspent" placeholder="100.00" required>
                        </div>
                        <div class="mb-3">
                        <label for="expensecategory"
class="form-label">Expense Category: </label>
                        <select name="category" id="category"
class="form-control" placeholder="Select a category">
                            <option value="">Select a category</option>
                            {% for cat in categories %}
                                <option value="{{ cat[0] }}">{{ cat[1]
}}</option>
                            {% endfor %}
                        </select>
                        </div>
                        <div class="mb-3">
                        <label for="date" class="form-label">Date of
Expense: </label>
                        <input type="date" class="form-control"
name="date" id="date" required></input>
                        </div>
                        <div class="mb-3">
                        <label for="description"
class="form-label">Description of Expense: </label>
                        <input type="text" class="form-control"
name="description" id="description"></input>
                        </div>
                        <!-- <div class="mb-3">
                        <label for="duration" class="form-label">Number of
autorenewals (in months) </label>
                        <input type="text" class="form-control"
name="autorenewals" id="autorenewals"></input>
                        </div> -->
                        <!-- <div class="mb-3"> -->
                        <!-- <label for="group"
class="form-label">Group(if needed): </label> -->
```

```
                        <!-- <div title="New group" style="float:right"
value="Create group" onclick="addGroup()">ADD GROUP</div><br/>

                        <select name="group" id="group"
class="form-control">
                            <option value="">Select existing
group</option>
                            {% for group in groups %}
                                <option value="{{ group[0] }}">{{ group[1]
}}</option>
                            {% endfor %}
                        </select>
                        </div> -->
                <!-- </div> -->
                <div class="card-footer text-muted"
style="text-align:center">
                    <button type="submit" value="submit"
style="background-color:#00AD83; border-color:#00AD83;
border-radius:5px;">Submit Expense</button>
                </div>
            </form>
        </div>
    </div>
</div>
{% endblock content %}

{% block script %}
    <script>
        function addGroup(e) {
            // e.preventDefault();
            group = window.prompt('Enter group name: ')
            console.log('PROMPT WINDOW SHOWN'+group);

            const formData = new FormData();
            formData.append("groupname", group);

            const xhttp = new XMLHttpRequest();
            xhttp.onload = function() {
                if (this.readyState == 4 && this.status == 200)
                    {var groupid= JSON.parse(this.responseText);
                    console.log(groupid);
                    // create option using DOM
                    const newOption = document.createElement('option');
                    const optionText =
document.createTextNode(groupid['groupname']);
                    newOption.appendChild(optionText);
                    newOption.setAttribute('value',groupid['groupID']);
```

```
                    const selectDropdown =
document.getElementById('group');
                    selectDropdown.appendChild(newOption);
                    console.log('GROUPID :'+ groupid['groupID']);
                }
            }
            xhttp.open("POST", "http://localhost:5000/addgroup");
            xhttp.send(formData);
        }
        document.querySelector('#date').valueAsDate = new Date();
    </script>
{% endblock script %}
```

registration.html

```
<!doctype html>
<html lang="en">
  <head>
    <!-- Required meta tags -->
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width, initial-scale=1">

    <!-- Bootstrap CSS -->
    <link
href="https://cdn.jsdelivr.net/npm/bootstrap@5.0.2/dist/css/bootstrap.min.
css" rel="stylesheet"
integrity="sha384-EVSTQN3/azprG1Anm3QDgpJLIm9Nao0Yz1ztcQTwFspd3yD65Vohhpuu
COmLASjC" crossorigin="anonymous">

    <title>Registration</title>
  </head>
    <script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.0.2/dist/js/bootstrap.bundle
.min.js"
integrity="sha384-MrcW6ZMFYlzcLA8Nl+NtUVF0sA7MsXsP1UyJoMp4YLEuNSfAP+JcXn/t
WtIaxVXM" crossorigin="anonymous"></script>

    <body style="background-color:#B2D3C2">
        <div class="container mt-3">
            <h1 style="color: black; text-align: center;">
                Personal Expense Tracker <img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/piggybank.png" style="width:50px;height: 45px;">
            </h1>
            <div class="container mt-2" style="width: 600px;">
                    <div class="card shadow-lg bg-white rounded">
```

```
                        <div class="card-header" style="text-align:
center;">
                          <h4>Registration Form</h4>
                        </div>
                        <div class="card-body">
                          <form action="/" method="POST">
                            <div class="mb-3">
                                <label for="email"
class="form-label">Email: </label>
                                <input type="email" class="form-control"
name="email" id="email" placeholder="abc@gmail.com">
                            </div>
                            <div class="mb-3">
                              <label for="passowrd"
class="form-label">Password: </label>
                              <input type="password"
class="form-control" name="password" id="password"></input>
                              <p style="color: gray;"
class="mt-3">Please make sure that the password meets the following
requirements:</p>
                              <ol style="color: gray;"><li>Minimum of 8
characters</li><li>Contains an upper case and a special
character</li></ol>
                            </div>
                            <div class="mb-3">
                              <label for="confirmpassword"
class="form-label">Confrim Password: </label>
                              <input type="password"
class="form-control" name="confirmpassword" id="confirmpassword"
placeholder="********">
                            </div>
                            <div class="mb-3">
                              <label for="wallet"
class="form-label">Initial Wallet Amount (Rs): </label>
                              <input type="number" class="form-control"
name="wallet" id="wallet" placeholder="10000.00">
                            </div>
                            <button type="submit"
style="background-color:#00AD83; border-color:#00AD83;
border-radius:5px;">Register</button>
                          </form>
                        </div>
                        <div class="card-footer text-muted"
style="text-align:center">
                          Already an existing user? <span><a
href="login">Login Here</a></span>
                        </div>
```

```
                    </div>
            </div>
        </div>
  </body>
</html>
```

rewards.html

```
{% extends 'base_template.html' %}

{% block title %}
<title>Goals and Rewards</title>
{% endblock title %}

{% set highlight = 'rewards' %}

{% block content %}

<div class="col py-3" style="background-color:#00AD83">

    <h3>Here are your current rewards and goals:</h3>
    <div class="card-deck">
        <!-- {% set count = 1 %} -->
        {% for goal in goals %}

        <div class="card shadow-lg bg-white rounded" style="margin:20px;width:20rem;
height:20rem;">
            <div class="card-header" style="text-align: center;">
                <h4>Goal and Reward {{loop.index}}</h4>
            </div>
            <div class="card-body">
                <h6 class="card-text">Amount Set: <span
style="color:#00AD83"> Rs {{goal[0]}}</span>
                <br><br>Reward: <span
style="color:#00AD83">{{goal[2]}}</span></h6>
            </div>
            <div class="card-footer text-muted" style="text-align:center">
                <h6><br><br>Date of Validity: <span
style="color:#00AD83">{{goal[1]}}</span></h6>
            </div>
        </div>
        {% endfor %}
    </div>

    <div style="text-align: center; margin-top: 5px">
```

```
        <img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/goal-icon.webp"
            style="margin-left:5px; height:30px; width:30px;">
        <a href="addgoal" style="color:black; text-decoration:none;"><h4style="display:
inline">Add Goal and Reward</h4></a>
    </div>


</div>
{% endblock content %}
```

setmonthlylimit.html

```
{% extends 'base_template.html' %}

{% block title %}
<title>Set Monthly Limit</title>
{% endblock title %}

{% set highlight = 'setmonthlylimit' %}

{% block content %}
<div class="col py-3" style="background-color:#00AD83">
    <h3 style="color:white; text-align: center;">Set Monthly Limit</h3>
    <div class="container mt-3" style="width: 600px;">
        <div class="card shadow-lg bg-white rounded">
            <form action="/setmonthlylimit" method="POST">
                <div class="card-header" style="text-align: center;">
                    <span style="display:inline-flex">
                        <h4>Monthly Limit</h4>
                        <img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/pay-15.png" style=" margin-left:10px; width:30px;
height:30px">
                    </span>
                    <div class="card-body">
                        <div class="mb-3">
                            <label for="monthlylimit"
class="form-label">Maximum amount allowed this month: (Rs) </label>
                            <input type="number" class="form-control"
name="monthlylimit" id="monthlylimit" placeholder="5000.00" required>
                        </div>
                    </div>
                    <div class="card-footer text-muted"
style="text-align:center">
```

```
                        <button type="submit" value="submit"
style="background-color:#00AD83; border-color:#00AD83;
border-radius:5px;">Set Monthly Limit</button>
                    </div>
                </div>
            </form>
        </div>
    </div>
</div>
{% endblock content %}
```

updatebalance.html

```
{% extends 'base_template.html' %}

{% block title %}
<title>Update Balance</title>
{% endblock title %}

{% block content %}
<div class="col py-3" style="background-color:#00AD83">
    <h3 style="color:white; text-align: center;">Update Balance</h3>
    <div class="container mt-3" style="width: 600px;">
        <div class="card shadow-lg bg-white rounded">
            <form action="/updatebalance" method="POST">
                <div class="card-header" style="text-align: center;">
                    <span style="display:inline-flex"><h4>Wallet
Balance</h4><img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/wallet_money.webp" style=" margin-left:10px; width:30px;
height:30px"></span>
                </div>
                <div class="card-body">
                        <div class="mb-3">
                        <label for="category" class="form-label">Current
Balance: </label>
                        <input type="text" value={{wallet}} readonly>
                        </div>
                        <div class="mb-3">
                        <label for="description" class="form-label">New
Balance: </label>
                        <input type="text" class="form-control"
name="balanceupdated" id="balanceupdated"></input>
                        </div>
                </div>
                <div class="card-footer text-muted"
style="text-align:center">
```

```
                    <button type="submit" style="background-color:#00AD83;
border-color:#00AD83; border-radius:5px;">Update Balance</button>
                </div>
            </form>
        </div>
    </div>
</div>
{% endblock content %}
```

viewrecurring.html

```
{% extends 'base_template.html' %}

{% block title %}
<title>View Recurring Expenses</title>
{% endblock title %}

{% set highlight = 'viewrecurring' %}

{% block content %}
<div class="col py-3" style="background-color:#00AD83">
    <h4 style="color:red;">{{ msg }}</h4>
    <h3 style="color:black; text-align: center;">Welcome Back! {{ email
}}</h3>
    <div class="d-flex justify-content-end">
        <img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/wallet_money.webp"
            style="height: 30px; width:30px">
        <h4 style="margin-left:10px;">Wallet Balance: <span><h5
style="display:inline"><i>{{wallet}}</i></h5></span></h4>
        <a href="updatebalance"><img
src="https://s3.jp-tok.cloud-object-storage.appdomain.cloud/personalexpens
etrackercapd/edit_pencil.png"
            style="margin-left:5px; height: 30px; width:30px"></a>
    </div>
    <h3>Here are your expenses:</h3>
    <div class="card-deck">
        <!-- {% set count = 1 %} -->
        {% for expense in expenses %}

        <div class="card shadow-lg bg-white rounded" style="margin:20px;width:20rem;
height:20rem;">
            <div class="card-header" style="text-align: center;">
                <h4>Expense {{loop.index}}</h4>
            </div>
            <div class="card-body">
```

```
                <h6 class="card-text">Amount Spent: <span
style="color:#00AD83"> Rs {{expense[0]}}</span>
                    <br><br>Reason: <span
style="color:#00AD83">{{expense[1]}}</span>
                <!-- <br><br>Category: <span
style="color:#00AD83">{{expense[3]}}</span></h6> -->
                <br><br> <button type = "button" name = "{{expense[1]}}"
onclick="removeExpense(name)"> Remove Expense </button>
            </div>
            <div class="card-footer text-muted" style="text-align:center">
                <h6>Date on which Expense was initiated: <span
style="color:#00AD83">{{expense[2]}}</span></h6>
            </div>
        </div>
        {% endfor %}
    </div>

</div>
{% endblock content %}

{% block script %}
<script>
    function removeExpense(e)
        {console.log("hello");
        // e.preventDefault();
        // group = window.prompt('Enter group name: ')
        // console.log('PROMPT WINDOW SHOWN'+group);

        window.alert("cancelling " + e + " autorenewal");
        const formData = new FormData();
        formData.append("description", e);

        const xhttp = new XMLHttpRequest();
        xhttp.onload = function() {
            if (this.readyState == 4 && this.status == 200)
                {window.location.reload
            }
        }
        xhttp.open("POST", "http://localhost:5000/removerecurring");
        xhttp.send(formData);
    }
</script>
{% endblock script %}
```

Dockerfile

```
FROM debian:stable
COPY . ./server
WORKDIR /server
RUN apt-get update
RUN apt-get install -y apt-utils
RUN apt install -y build-essential libxml2
RUN apt install -y python3
RUN apt install -y python3-pip
RUN rm -rf /var/lib/apt/lists/*
RUN apt-get update
RUN pip3 install -r requirements.txt
EXPOSE 5000
CMD [ "python3", "-m" , "flask", "run", "--host=0.0.0.0"]
```

requirements.txt

```
APScheduler==3.9.1.post1
blinker==1.5
click==8.1.3
contourpy==1.0.6
cycler==0.11.0
Flask==2.2.2
Flask-Cors==3.0.10
Flask-Mail==0.9.1
fonttools==4.38.0
ibm-db==3.1.3
itsdangerous==2.1.2
Jinja2==3.1.2
kiwisolver==1.4.4
MarkupSafe==2.1.1
matplotlib==3.6.2
numpy==1.23.4
packaging==21.3
pandas==1.5.1
Pillow==9.3.0
plotly==5.11.0
pyparsing==3.0.9
python-dateutil==2.8.2
pytz==2022.6
pytz-deprecation-shim==0.1.0.post0
six==1.16.0
tenacity==8.1.0
```

```
tzdata==2022.6
tzlocal==4.2
Werkzeug==2.2.2
```

13.2 Github and Project Demo Link:

https://github.com/IBM-EPBL/IBM-Project-3842-1658651226