

# **Project Report**

1. **INTRODUCTION**
  - 1.1 Project Overview
  - 1.2 Purpose
2. **LITERATURE SURVEY**
  - 2.1 Existing problem
  - 2.2 References
  - 2.3 Problem Statement Definition
3. **IDEATION & PROPOSED SOLUTION**
  - 3.1 Empathy Map Canvas
  - 3.2 Ideation & Brainstorming
  - 3.3 Proposed Solution
  - 3.4 Problem Solution fit
4. **REQUIREMENT ANALYSIS**
  - 4.1 Functional requirement
  - 4.2 Non-Functional requirements
5. **PROJECT DESIGN**
  - 5.1 Data Flow Diagrams
  - 5.2 Solution & Technical Architecture
  - 5.3 User Stories
6. **PROJECT PLANNING & SCHEDULING**
  - 6.1 Sprint Planning & Estimation
  - 6.2 Sprint Delivery Schedule
  - 6.3 Reports from JIRA
7. **CODING & SOLUTIONING (Explain the features added in the project along with code)**
  - 7.1 Feature 1
  - 7.2 Feature 2
  - 7.3 Database Schema (if Applicable)
8. **TESTING**
  - 8.1 Test Cases
  - 8.2 User Acceptance Testing
9. **RESULTS**
  - 9.1 Performance Metrics
10. **ADVANTAGES & DISADVANTAGES**
11. **CONCLUSION**
12. **FUTURE SCOPE**
13. **APPENDIX**
  - Source Code
  - GitHub & Project Demo Link

## 1. INTRODUCTION

### a. Project Overview

Due to the lack of a complete tracking system, there is a constant overload to rely on the daily entry of the expenditure and totalling it down at the end of the month. So to avoid all the hassles of the age-old traditional system, this project is an attempt to manage our daily expenses in a more efficient, simple, fast, smooth and effective way.

### b. Purpose

This system enables the user to track their expenses as well as it makes valuable suggestions, feedback and timely alerts for a smooth experience.

## 2. LITERATURE SURVEY

### a. Existing problem

In existing, we need to maintain the excel sheets, csv etc. files for the user daily and monthly expenses. In existing, there is no as such complete solution to keep a track of its daily expenditure easily. to do so a person as to keep a log in a diary or in a computer, also all the calculations needs to be done by the user which may sometimes results in errors leading to losses. This project is about mobile application Expenses system with geo-location tracking, Based on the location of the user, it using Google Places, to check, the available store in the area, provides a notification for offers purpose, In term of security design, this system may implement a login authentication such as OTP message to your mobile device, this function may bring more security confidence to user.

### b. References

- [1] Bekaroo, G., & Sunhaloo, S. Intelligent Online Budget Tracker.
- [2] Underwood, D. (2011). A Case Study of Tracking Expenses by Commodity at Widget Farmers' Cooperative.
- [3] Chandini, S., Poojitha, T., Ranjith, D., Akram, V. M., Vani, M. S., & Rajyalakshmi, V. (2019). Online Income and Expense Tracker.
- [4] Satpute, M. K., Kale, A., Mandal, A., & Krishnan, R. SURVEY ON CLASSIFICATION ENGINE FOR MONETARY TRANSACTIONS
- [5] Sabab, S. A., Islam, S. S., Rana, M. J., & Hossain, M. (2018, September). eExpense: A smart approach to track everyday expense. In 2018 4th International Conference on Electrical Engineering and Information & Communication Technology (iCEEiCT) (pp. 136-141). IEEE.
- [6] Rajaprabha, M. N. (2017). Family Expense Manager Application in Android. MS&E, 263(4), 042050
- [7] Kan, C., Lynch, J., & Fernbach, P. (2015). How budgeting helps consumers achieve financial goals. ACR North American Advances.
- [8] Sharma, R., 2020. Case Study Of Expense Tracking App: Get Daily Alerts Of Your Expense. [online] Medium.
- [9] Thanapal, M. P., Patel, Y., Lokesh, R. T. P., & Satheesh, K. J. (2015). Income and expense tracker. Indian Journal of Science and Technology, 8(S2), 118-122.

- [10] Manchanda, A. (2012). Expense Tracker Mobile Application (Doctoral dissertation, San Diego State University).
- [11] Access Consultants. (1998). the final report on the analysis of the household budget and expenditure survey for St. Vincent and the Grenadines. Atlanta GA.  
Retrieved August 15, 2006, from  
<http://www.geocities.com/CollegePark/Library/3954/svghbes.pdf>
- [12] Central Statistics Office. (2001). Household budget survey. Government of Ireland.  
Retrieved August 15, 2006, from  
<http://www.cso.ie/releasespublications/documents/housing/hbs.pdf>
- [13] European Countries. (2004). Household budget surveys in candidate countries: Methodological analysis 2003. European Countries. Luxembourg. Retrieved February 19, 2007,  
[http://europa.eu.int/estatref/info/sdds/en/hbs/hbs\\_meth2003\\_cand\\_countries.pdf](http://europa.eu.int/estatref/info/sdds/en/hbs/hbs_meth2003_cand_countries.pdf)
- [14] International Research Journal of Engineering and Technology (IRJET)
- [15]  
[https://www.researchgate.net/publication/237448489\\_Intelligent\\_Online\\_Budget\\_Tracker](https://www.researchgate.net/publication/237448489_Intelligent_Online_Budget_Tracker)  
(Bekaroo, Girish & Sunhaloo, Sameer. (2007). Intelligent Online Budget Tracker.)
- [16] <https://www.irjet.net/archives/V6/i3/IRJET-V6I31110.pdf>
- [17] M N Rajaprabha 2017 IOP Conf. Ser.: Mater. Sci. Eng. 263 042050
- [18] <https://easychair.org/publications/preprint/73S7>
- [19] <https://medium.com/@rajotiya.ravi2/case-study-of-expense-tracking-app-get-daily-alertsof-your-expense-a0561526973d>

### c. **Problem Statement Definition**

There is no proper solution available in the market which enables people to keep a track of their daily expenses easily. To do so people have to maintain all the records of their expenses in some form or other, also all the calculations are to be performed manually by the user which may at times result in errors leading to unfavourable circumstances. Due to the lack of a complete tracking system, there is a constant overload to rely on the daily entry of the expenditure and totalling it down at the end of the month. So to avoid all the hassles of the age-old traditional system, this project is an attempt to manage our daily expenses in a more efficient, simple, fast, smooth and effective way. The system aims to eliminate the burden of the user by eliminating the need for manual tracking and calculations to keep track of the expenditure. This system enables the user to track their expenses as well as it makes valuable suggestions, feedback and timely alerts for a smooth experience.

### 3. IDEATION & PROPOSED SOLUTION

#### a. Empathy Map Canvas



#### b. Ideation & Brainstorming

Step-1: Team Gathering, Collaboration and Problem Statement

##### Define your problem statement

Money mismanagement leads to financial burden. Having an omnipresent monitoring system will help keep track of person's finance

🕒 5 minutes



Step-2: Brainstorm, Idea Listing and Grouping

Brainstorm

🕒 10 minutes

Dinesh B

Automatic Message Reader	Splitting the bills among people who spend together	Weekly report of financial expenses
Setting budget for a month		

Arun N

Giving a visual representation	Reminder to collect money returns/dues	Priorize certain expense
Track shopping spree		

Kanyalakshmi G

Alert when the account reaches minimum balance	Categorized expenditure splitup	Set financial goal
Daily expenditure		

Harsha TR

Prediction model to spend wisely	Dedicated monthly, weekly schedule alert	Split the budget category wise, like food, laundry, travel etc.
Incentives for better financial management		

🕒 20 minutes

**Alert**

Weekly report of financial expenses

Daily expenditure

Alert when the account reaches minimum balance

Dedicated monthly, weekly schedule alert

Prediction model to spend wisely

Reminder to collect money returns/dues

**Data representation**

Giving a visual representation

Weekly report of financial expenses

Categorized expenditure splitup

Track shopping spree

**Collective tracking**

Split the budget category wise, like food, laundry, travel etc.

Prediction model to spend wisely

Categorized expenditure splitup

Priorize certain expense

Track shopping spree

Splitting the bills among people who spend together

**Rewards and Benefits**

Incentives for better financial management

Set financial goal

Automatic Message Reader

Setting budget for a month

Reminder to collect money returns/dues

Splitting the bills among people who spend together

### Step-3: Idea Prioritization



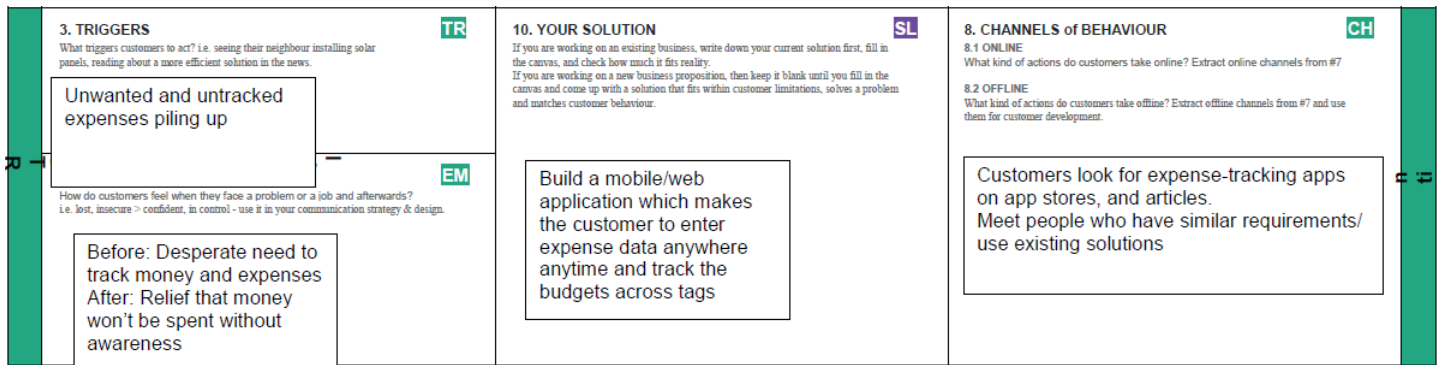
### c. Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Money mismanagement leads to financial burden. Having an omnipresent monitoring system will help keep track of a person's finances.
2.	Idea / Solution description	To solve the above we could introduce an App to monitor and keep track of expenses, with suggestions.
3.	Novelty / Uniqueness	Adding a group expense feature, where a user can control other users ids along

		with the type of activity and the total group expense. App automatically evenly splits the money and records it in all mentioned users profile
4.	Social Impact / Customer Satisfaction	It will help the people to track their expenses and also alert when they exceed the limit of your budget. Group expenses are handled seamlessly
5.	Business Model (Revenue Model)	Rewards and expansion with maintenance fee can be viewed for getting profit after boarding sufficient customers. Making new Data analytics for premium users will also pay off in the long run.
6.	Scalability of the Solution	Since the tracking data is completely cloud supported, the solution is fully scalable and for doing so, the architecture needs to be scaled to preferred ones.

#### d. Problem Solution fit

<b>Define CS, fit into CC</b> Focus on J&P, tap into BE, understand RC	<b>1. CUSTOMER SEGMENT(S)</b> Who is your customer? <div>Anyone with a bank account and has knowledge on mobile apps</div>	<b>6. CUSTOMER CONSTRAINTS</b> What constraints prevent your customers from taking action or limit their choices of solutions? (i.e. spending power, budget, no cash, network connection, available devices.) <div>Lack of time to sit down and manually enter data periodically and inability to do it on the go.</div>	<b>5. AVAILABLE SOLUTIONS</b> Which solutions are available to the customers when they face the problem? or need to get the job done? What have they tried in the past? What pros & cons do these solutions have? (i.e. pen and paper) <div>Write the savings manually and keep track. Using envelopes as tags and fixing the budget for each tag. Both are time consuming</div>	<b>Explore AS, differential</b> Focus on J&P, tap into BE, understand RC
	<b>2. JOBS-TO-BE-DONE / PROBLEMS</b> Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides. <div>Easy tracking of expenses that is manually entered by the customer.</div>	<b>9. PROBLEM ROOT CAUSE</b> What is the real reason that this problem exists? What is the back <div>People spend money on different items and at different points of time, so accumulating all those purchases and noting down is difficult</div>	<b>7. BEHAVIOUR</b> What does your customer do to address the problem and get the job done? (i.e. directly related: find the right solar panel installer, calculate <div>Ask for suggestions from friends and colleagues. Explore different options online</div>	



## 4. REQUIREMENT ANALYSIS

### a. Functional requirement

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIn
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Delete Account	Confirmation via Email Confirmation via Password
FR-4	Transaction summary	Weekly Transactions Monthly Transactions
FR-5	Budget Carryover	Option to move the leftover budget to next month.
FR-6	Summary/Report	Based on categories and priorities. Inputs/Feedback based on spends.
FR-7	Mitigate Manual Errors	Using API's make note of online transactions and classify them.
FR-8	Prevent Data Loss	Replication Sharding
FR-9	Visualisation of expenses	Using visualisation tools to display the expense split

### b. Non-Functional requirements

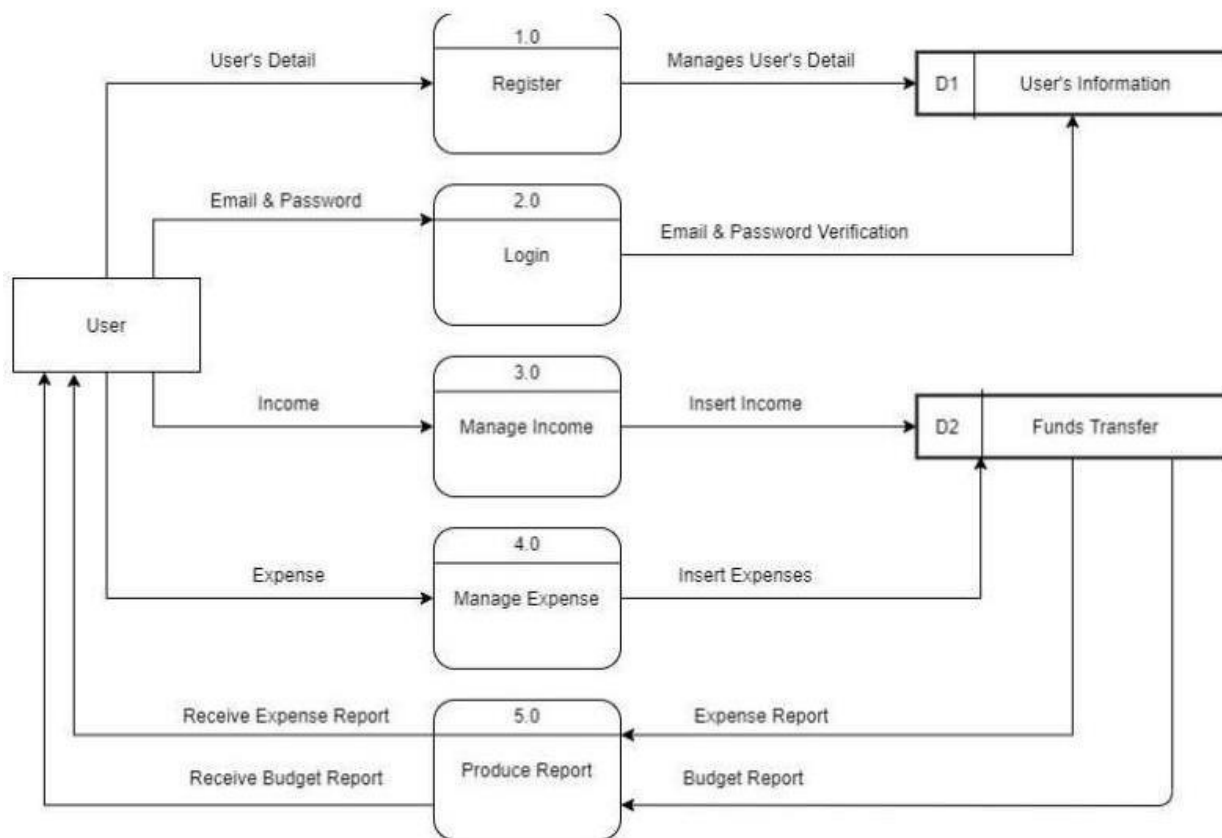
FR No.	Non-Functional Requirement	Description
NFR-1	Usability	The system shall be user-friendly and can be used easily by the masses.
NFR-2	Security	The system shall only permit authorized users to access the system. The system shall prevent unauthorized users



		from entering the system.
NFR-3	Reliability	The system shall be in the operational mode for at least 320 days in a year. In case of failure, the system shall be able to recover in under 5 seconds.
NFR-4	Performance	The system shall be able to record a user's expense as input, process and display it in under 2 seconds.
NFR-5	Availability	The system shall be available for public use as long as it remains operational.
NFR-6	Scalability	The system shall be accessible to over 10,000 concurrent users without any loss of performance.

## 5. PROJECT DESIGN

### a. Data Flow Diagrams



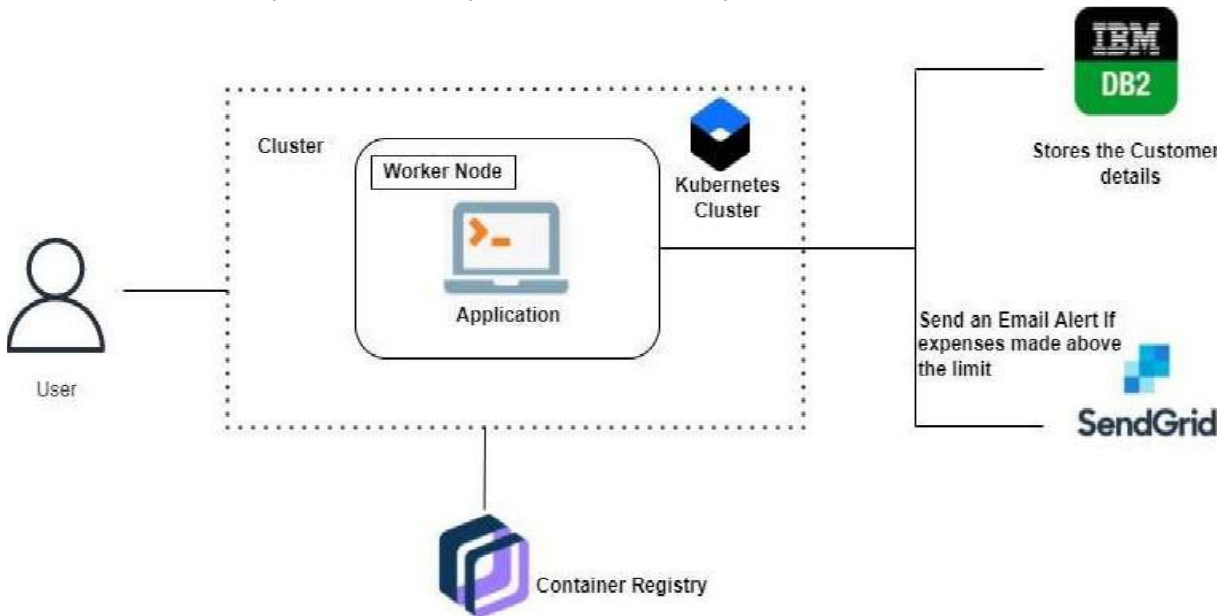
## b. Solution & Technical Architecture

Solution Architecture:

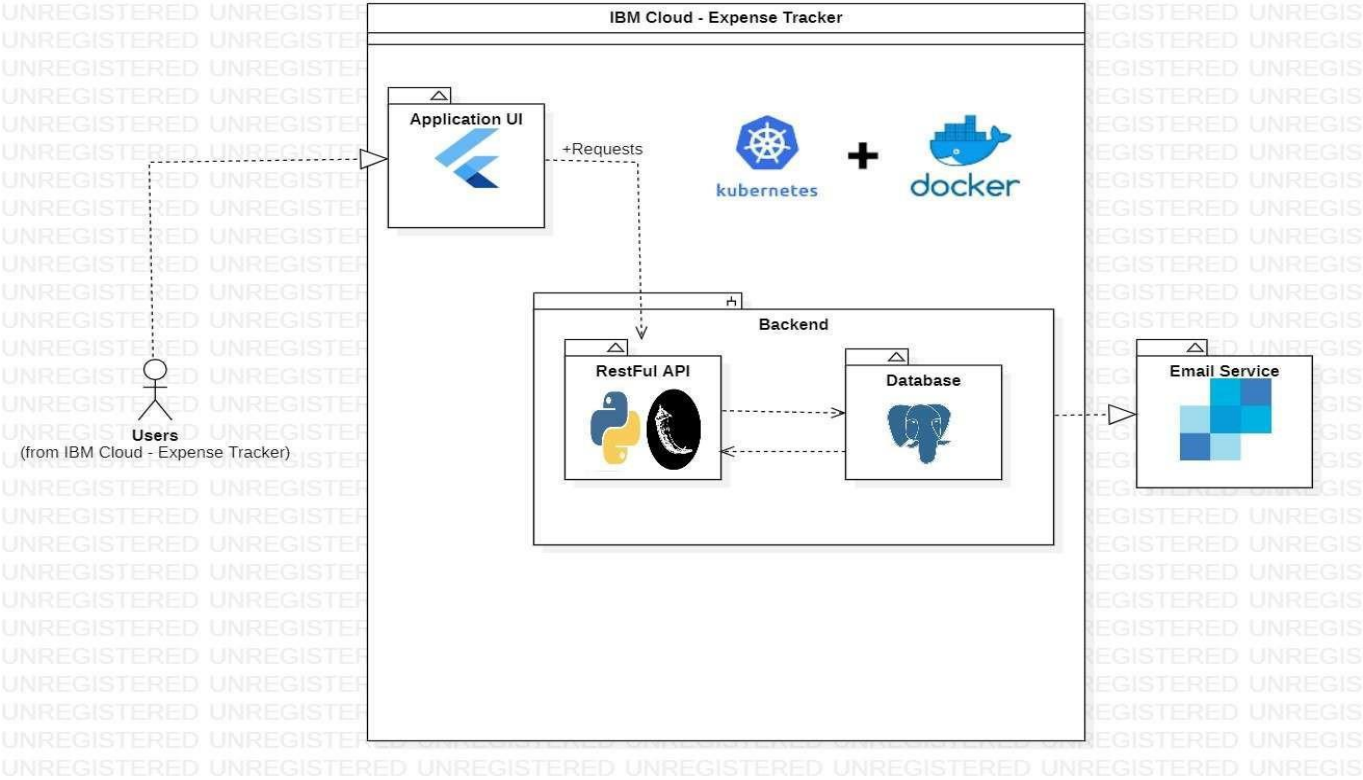
- Software Requirements:  
Python, Flask , Docker, IBM Cloud, SendGrid
- Minimum System Requirements:  
8GB RAM, Intel Core i3, OS- Windows/Linux/MAC , Laptop or Desktop

Product Requirements:

1. Initialize balance on signing up.
2. Update balance whenever necessary.
3. Add expenses along with their categories.
4. Update an expense.
5. Display remaining balance.
6. Visualize expenditure patterns with pictorialization tools.
7. Set a monthly limit on expenditure.
8. Notify users when they exceed their monthly limit



Technology Architecture



Component	Description	Technology
UI	User Interface for accessing features of the application	Flutter
Server Implementation	Provides RestFul Services for manipulating user data from the events of UI	Python:Flask
DB	Persistent Data storage	PostgresSQL
Mail Service	Sending mail to user in case of any important event	Sendgrid
Deployment	Deployment of application in the cloud	Containerization by Docker, Orchestration by Kubernetes

## Application Characteristics: Personal Expense Tracker Application

Characteristics	Description	Technology
Open Source	Source Code of tools available to public	All tools used for development are open source by nature
Security	Maintaining Data Confidentiality and Authorization	Brcrypt for hashing and AES for encryption, HTTPS for overall security during transmission
Scalability and Availability	Use of microservices ensures scalability in business logic, Cloud Application serves very well in Scability and Availability	Flask - microservices architecture, Kubernetes for maintaing scalability in deployment

### c. User Stories

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task
Sprint-1	Login Page	IM-1	As a user I should be able to register to the app
Sprint-1	Login Page	IM-2	As a user I should be able to login to the app
Sprint-2	Timeline Page	IM-4	As a user I should be able to access my Timelines tab
Sprint-2	Timeline Page	IM-5	As a user I should be able to filter according to date
Sprint-2	Timeline Page	IM-6	As a user I should be able to see my expenses graph
Sprint-2	Timeline Page	IM-7	As a user I should be able to see my daily expenditure
Sprint-2	Timeline Page	IM-8	As a user I should be able to fix the category of expense

Sprint-3	Profile Page	IM-16	As a user I should be able to access my profile page
Sprint-3	Profile Page	IM-17	As a user I should be able to edit my details
Sprint-3	Profile Page	IM-18	As a user I should be able to logout
Sprint-4	Budget Page + Deployment	IM-10	As a user, I can launch the application and add or manage the expenses and get notified for over spent.
Sprint-4	Budget Page + Deployment	IM-11	As a user I should be able to access the budgets page
Sprint-4	Budget Page + Deployment	IM-12	As a user I should be able to set my monthly budgets
Sprint-4	Budget Page + Deployment	IM-13	As a user I should be able to monitor different category of expenses
Sprint-4	Budget Page + Deployment	IM-14	As a user I should be able to see the graphical representation of my expenses
Sprint-4	Budget Page + Deployment	IM-19	As a user I should be able to use the app on the cloud platform

## 6. PROJECT PLANNING & SCHEDULING

### a. Sprint Planning & Estimation

#### Product Backlog, Sprint Schedule, and Estimation (4 Marks)

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Login Page	IM-1	As a user I should be able to register to the app	2	High	Kanyalakshmi G, Arun N R, Dinesh B

Sprint-1	Login Page	IM-2	As a user I should be able to login to the app	2	High	Dinesh B, Harsha TR
Sprint-2	Timeline Page	IM-4	As a user I should be able to access my Timelines tab	3	High	Harsha TR, Kanyalakshmi G
Sprint-2	Timeline Page	IM-5	As a user I should be able to filter according to date	2	High	Dinesh B, Arun N R
Sprint-2	Timeline Page	IM-6	As a user I should be able to see my expenses graph	2	Medium	Harsha TR, Kanyalakshmi G, Dinesh B
Sprint-2	Timeline Page	IM-7	As a user I should be able to see my daily expenditure	5	High	Harsha TR, Arun N R
Sprint-2	Timeline Page	IM-8	As a user I should be able to fix the category of expense	5	High	Dinesh B, Arun N R
Sprint-3	Profile Page	IM-16	As a user I should be able to access my profile page	3	High	Harsha TR, Kanyalakshmi G, Arun N R
Sprint-3	Profile Page	IM-17	As a user I should be able to edit my details	2	Medium	Kanyalakshmi G, Arun N R
Sprint-3	Profile Page	IM-18	As a user I should be able to logout	3	High	Dinesh B, Harsha TR
Sprint-4	Budget Page + Deployment	IM-10	As a user, I can launch the application and add or manage the expenses and get notified for over spent.	3	High	Harsha TR, Kanyalakshmi G, Arun N R, Dinesh B
Sprint-4	Budget Page + Deployment	IM-11	As a user I should be able to access the budgets page	3	High	Harsha TR, Arun N R
Sprint-4	Budget Page + Deployment	IM-12	As a user I should be able to set my monthly budgets	3	High	Dinesh B, Arun N R
Sprint-4	Budget Page + Deployment	IM-13	As a user I should be able to monitor different category of expenses	3	High	Harsha TR, Kanyalakshmi G, Arun N R

Sprint-4	Budget Page + Deployment	IM-14	As a user I should be able to see the graphical representation of my expenses	3	High	Kanyalakshmi G, Arun N R
Sprint-4	Budget Page + Deployment	IM-19	As a user I should be able to use the app on the cloud platform	4	High	Dinesh B, Harsha TR
						Harsha TR, Kanyalakshmi G, Arun N R, Dinesh B

**Project Tracker, Velocity & Burndown Chart: (4 Marks)**

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	7	6 Days	24 Oct 2022	29 Oct 2022	7	- (Meet Planned Date)
Sprint-2	7	6 Days	31 Oct 2022	05 Nov 2022	7	- (Meet Planned Date)
Sprint-3	13	6 Days	07 Nov 2022	12 Nov 2022	13	- (Meet Planned Date)
Sprint-4	8	6 Days	14 Nov 2022	19 Nov 2022	8	- (Meet Planned Date)

**Velocity:**

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

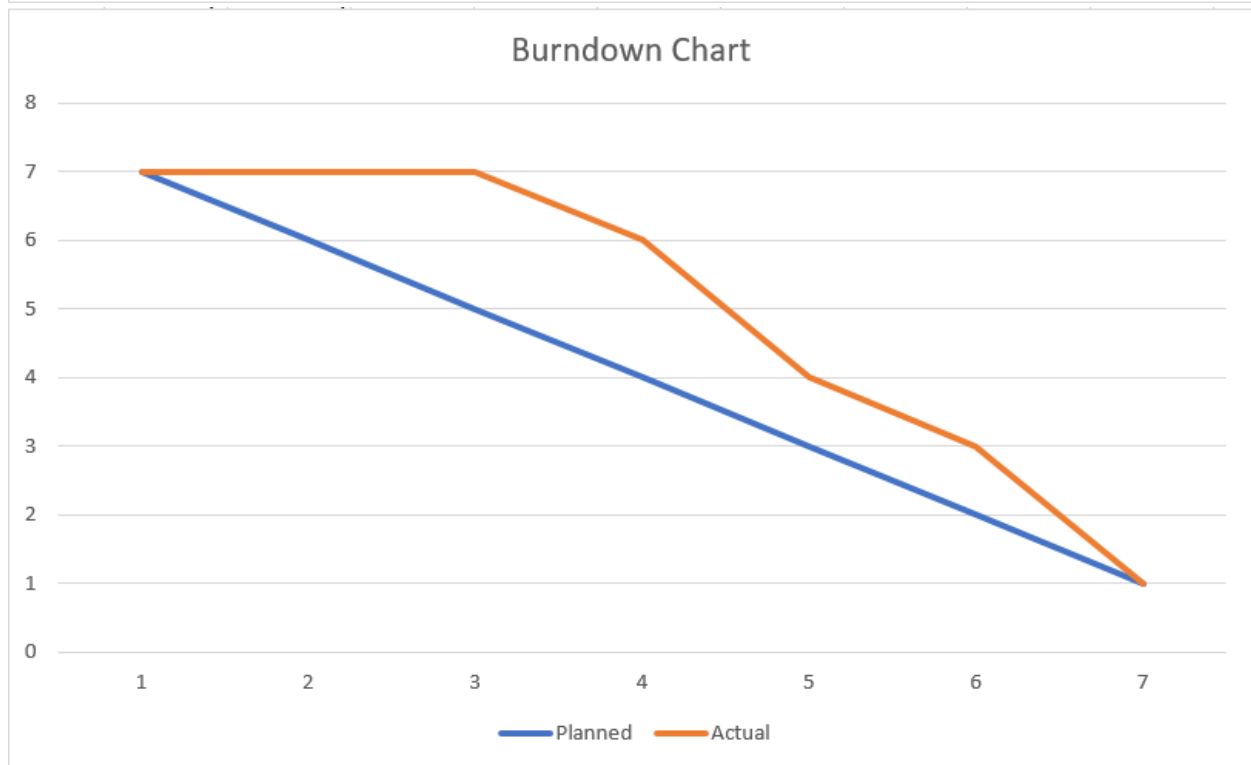
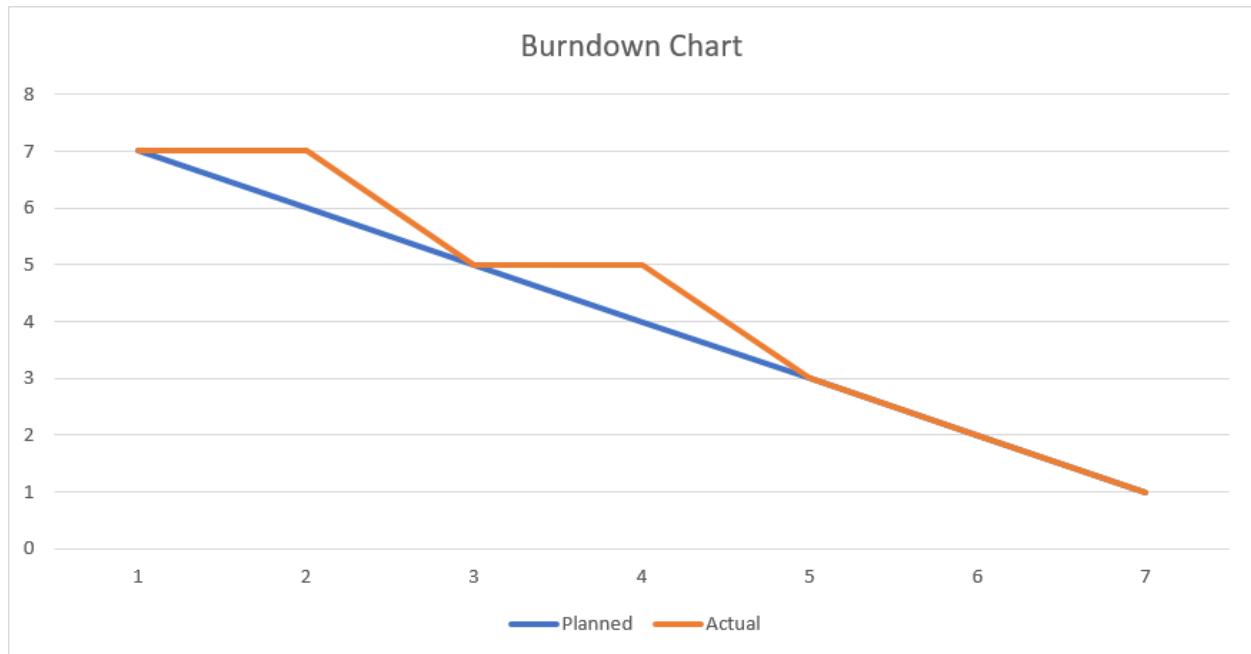
$$AV = \frac{\text{sprint duration}}{\text{velocity}} = \frac{20}{10} = 2$$

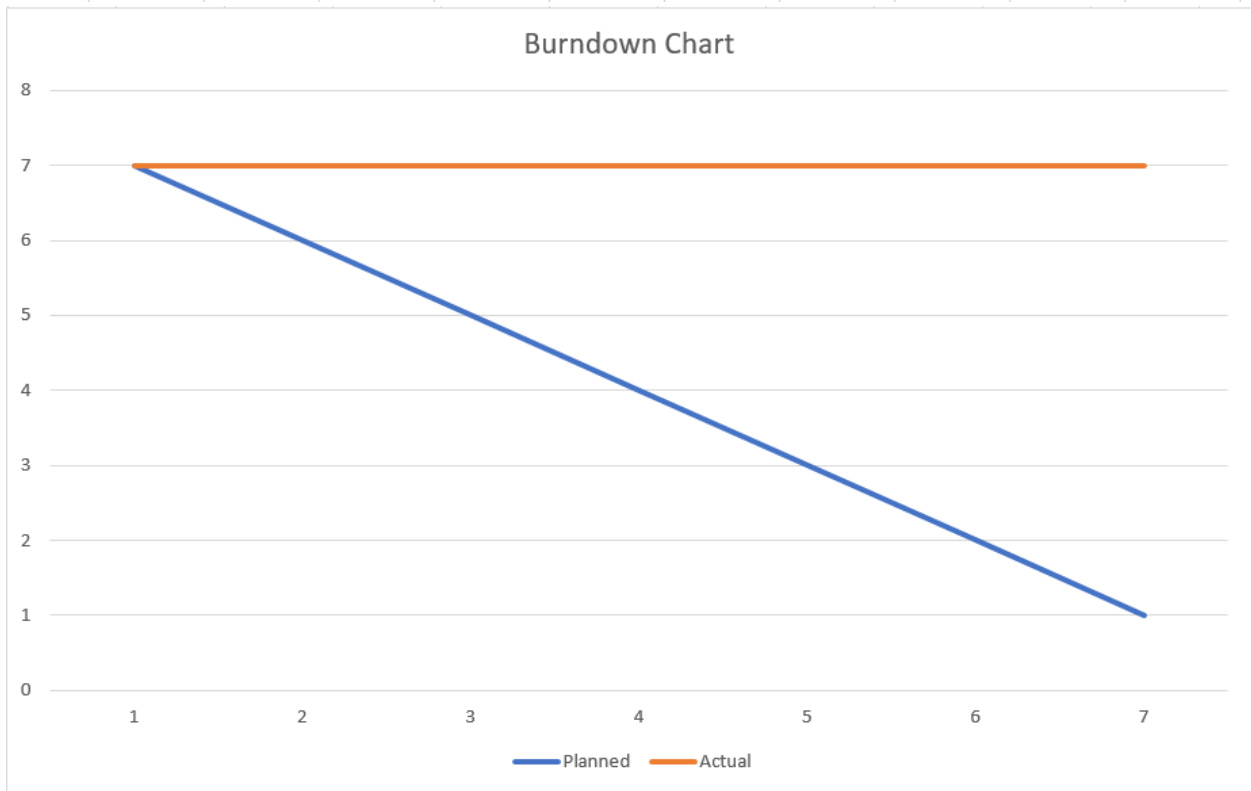
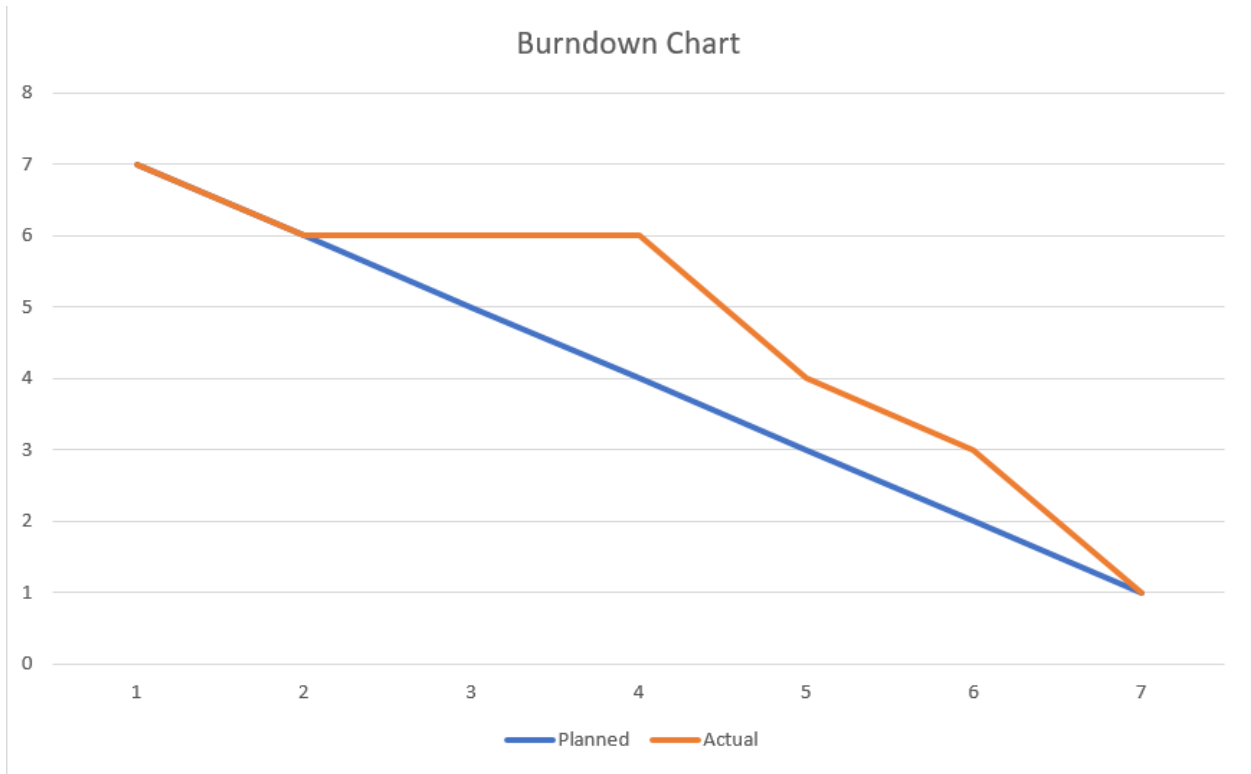
## b. Sprint Delivery Schedule

																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													</
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	----



**c. Reports from JIRA**  
**Burndown Chart:**





## 7. CODING & SOLUTIONING (Explain the features added in the project along with code)

### a. Feature 1

#### Login Page:

**Aim:** to create a login page and test it

**Purpose:** the purpose of the login page is to give a way for the user to login into the application and also to enable him/her to register to the app

#### Code:

```
import 'package:flutter/material.dart';
import 'package:flutter/services.dart';
import 'package:google_fonts/google_fonts.dart';
import 'package:ledgerfe/login/utilities/logo.dart';
import 'package:ledgerfe/login/utilities/submit_button.dart';
import 'package:ledgerfe/login/utilities/username_field.dart';

class MobileView extends StatelessWidget {
  const MobileView({Key? key}) : super(key: key);

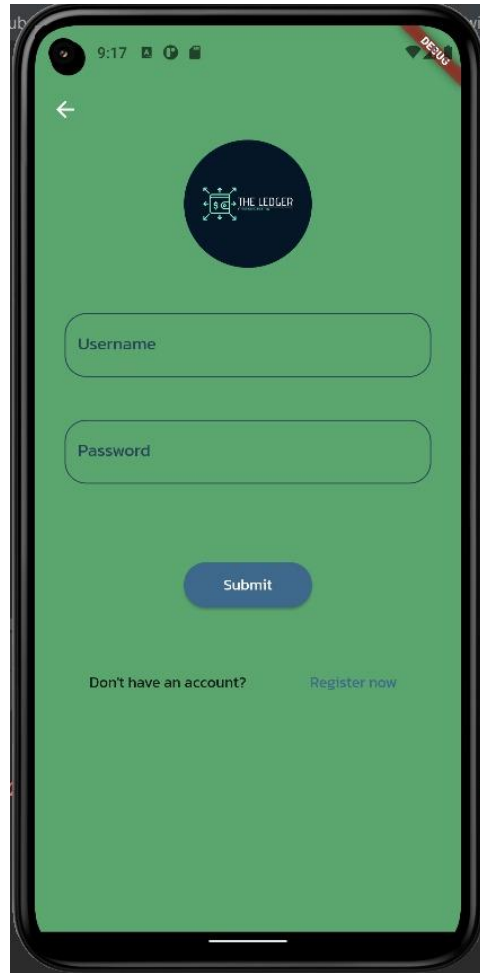
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      backgroundColor: const Color(0xFF5BA66E),
      appBar: AppBar(
        systemOverlayStyle: SystemUiOverlayStyle(statusBarColor:
Colors.white.withOpacity(0)),
        backgroundColor: const Color(0xFF5BA66E),
        elevation: 0,
      ),
      body: SingleChildScrollView(
        child: Column(
          children: <Widget>[
            Logo(),
            SizedBox(
              height: MediaQuery.of(context).size.height*0.05,
            ),
            UsernameField(),
            Padding(
              padding: EdgeInsets.fromLTRB(MediaQuery.of(context).size.width*0.07, 0,
MediaQuery.of(context).size.width*0.07, MediaQuery.of(context).size.width*0.07),
              child: TextField(
                obscureText: true,
                enableSuggestions: false,
                autocorrect: false,
                decoration: InputDecoration(
```

```

        labelText: 'Password',
        border: OutlineInputBorder(),
      ),
    ),
  ),
  SizedBox(
    height: MediaQuery.of(context).size.height*0.05 ,
  ),
  const SubmitButton(),
  SizedBox(
    height: MediaQuery.of(context).size.height*0.05 ,
  ),
  Row(
    mainAxisAlignment: MainAxisAlignment.spaceEvenly,
    children: <Widget>[
      Text(
        "Don't have an account?",
        style: GoogleFonts.kanit()
      ),
      TextButton(
        onPressed: () {},
        child: Text(
          "Register now",
          style: GoogleFonts.kanit()
        ),
      ),
    ],
  ),
),
);
}
}

```

### Output:



### b. Feature 2

#### Timeline page:

**Aim:** to create a dashboard page for the app for the user to travel to other associated pages and also to show vital information in the template page and also allow the user to add and monitor daily expenses

**Purpose:** the purpose of this age is to integrate the functionality of the app using this as the dashboard where the daily expenses and related category of expenses are added and also monitor the expenses by displaying the infographic on a graph structure.

#### Code:

```
import 'package:flutter/material.dart';
import 'package:font_awesome_flutter/font_awesome_flutter.dart';
import 'package:ledgerfe/timeline/services/expense_data.dart';
import 'package:ledgerfe/timeline/utilities/expense_cards.dart';
import 'package:ledgerfe/timeline/utilities/representation.dart';
import 'package:flutter_datetime_picker/flutter_datetime_picker.dart';
```

```

class MobileView extends StatefulWidget {
  const MobileView({Key? key}) : super(key: key);

  @override
  State<MobileView> createState() => _MobileViewState();
}

```

```

class _MobileViewState extends State<MobileView> {
  PageController controller = PageController(viewportFraction: 1.0);
  List<ExpenseData> val=<ExpenseData>[ExpenseData(tag: "education",time:
"Monday",remarks: "summa",amount: 25.0),ExpenseData(tag: "education",time:
"Monday",remarks: "summa",amount: 25.0)];
  DateTime from = DateTime.now();
  DateTime to = DateTime.now();
  StatefulBuilder filter(){
    return StatefulBuilder(
      builder: (context,setState){return AlertDialog(
        title: const Text("Filter by date"),
        content: Column(
          children: <Widget>[
            ElevatedButton(
              onPressed: (){
                DatePicker.showDateTimePicker(
                  context,
                  showTitleActions: true,
                  minTime: DateTime(1970,1,1),
                  maxTime: DateTime(2080,1,1),
                  onConfirm: (date){
                    setState() {
                      from = date;
                    });
                  }, currentTime: DateTime.now(), locale: LocaleType.en);
                },
            child: Text(
              "${from.year}/${from.month}/${from.day}"
            ),
          ],
        ),
      ElevatedButton(
        onPressed: (){
          DatePicker.showDateTimePicker(
            context,
            showTitleActions: true,

```

```

        minTime: DateTime(1970,1,1),
        maxTime: DateTime(2080,1,1),
        onConfirm: (date){
            setState(() {
                to = date;
            });
        }, currentTime: DateTime.now(), locale: LocaleType.en);
    },
    child: Text(
        "${to.year}/${to.month}/${to.day}"
    ),
)
],
),
actions: <Widget>[
    TextButton(
        onPressed: () => Navigator.pop(context, 'Cancel'),
        child: const Text('Cancel'),
    ),
    TextButton(
        onPressed: () {
            Navigator.pop(context, 'OK');
        },
        child: const Text('Submit'),
    ),
],
);}
);
}
@override
Widget build(BuildContext context) {
    return Scaffold(
        appBar: AppBar(
            actions: [
                IconButton(
                    onPressed: () => showDialog(
                        context: context,
                        builder: (BuildContext context) => filter()
                    ),
                    icon: const Icon(
                        FontAwesomeIcons.filter,
                        color: Color(0xFF3e688c),
                    )
                ),
            ],
        ),
    );
}

```

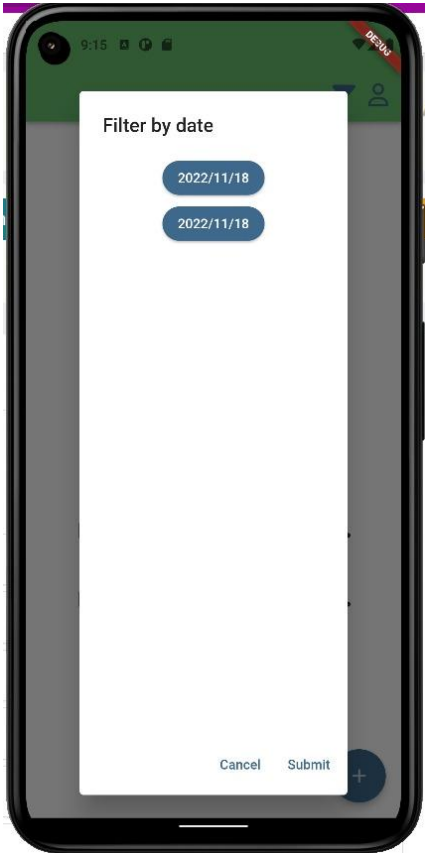
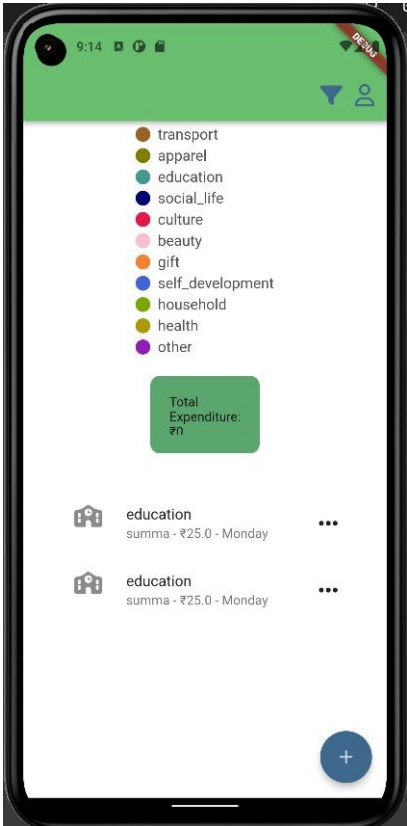
```

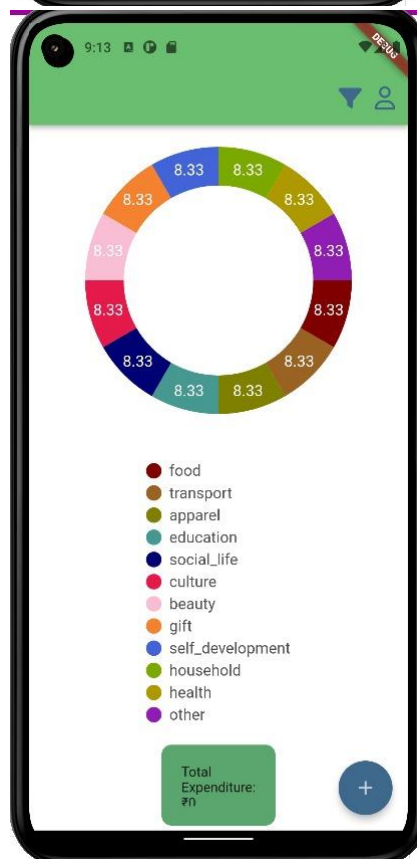
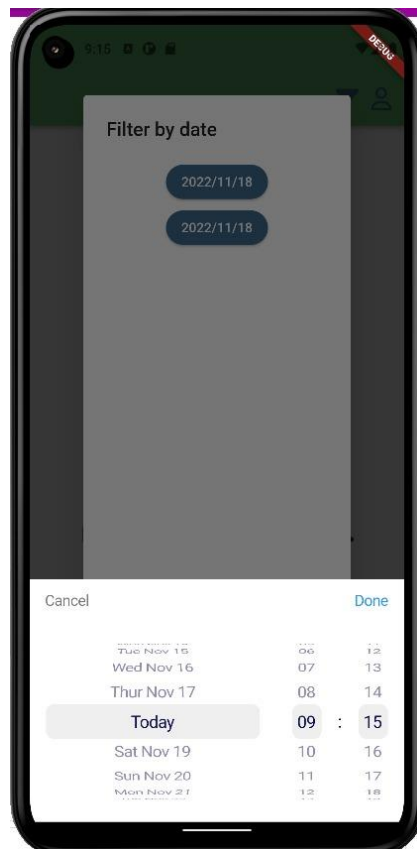
InkWell(
  onTap: () {},
  child: const Padding(
    padding: EdgeInsets.fromLTRB(0, 0, 12, 0),
    child: Icon(
      FontAwesomeIcons.user,
      color: Color(0xFF3e688c),
    ),
  ),
),
],
),
body: RawScrollbar(
  thickness: 10,
  radius: const Radius.circular(12),
  timeToFade: const Duration(seconds: 1),
  controller: controller,
  child: PageView(
    pageSnapping: false,
    scrollDirection: Axis.vertical,
    controller: controller,
    children: [
      const Representation(),
      ExpenseCards(expenses: val),
    ],
  ),
),
floatingActionButton: FloatingActionButton(
  child: const Icon(Icons.add),
  onPressed: () {},
),
);
}
}

```



Output:





### c. Database Schema

```
olamohno=> \d apparel
```

Table "public.apparel"				
Column	Type	Collation	Nullable	Default
budget	double precision			
expenditure	double precision			
uid	uuid			

Foreign-key constraints:

"apparel\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)

```
olamohno=> \d auth
```

Table "public.auth"				
Column	Type	Collation	Nullable	Default
uid	uuid		not null	uuid_generate_v4()
email	character varying		not null	
password	character varying		not null	

Indexes:

"auth\_pkey" PRIMARY KEY, btree (uid)

Referenced by:

TABLE "apparel" CONSTRAINT "apparel\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)  
TABLE "beauty" CONSTRAINT "beauty\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)  
TABLE "culture" CONSTRAINT "culture\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)  
TABLE "education" CONSTRAINT "education\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)  
TABLE "food" CONSTRAINT "food\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)  
TABLE "gift" CONSTRAINT "gift\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)  
TABLE "health" CONSTRAINT "health\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)  
TABLE "history" CONSTRAINT "history\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)  
TABLE "household" CONSTRAINT "household\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)  
TABLE "jwt" CONSTRAINT "jwt\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)  
TABLE "other" CONSTRAINT "other\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)  
TABLE "self\_development" CONSTRAINT "self\_development\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)  
TABLE "social\_life" CONSTRAINT "social\_life\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)  
TABLE "transport" CONSTRAINT "transport\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)

olamohno=> \d jwt

Table "public.jwt"				
Column	Type	Collation	Nullable	Default
jti	uuid		not null	uuid_generate_v4()
uid	uuid			
expiration_date	timestamp without time zone		not null	

Indexes:

"jwt\_pkey" PRIMARY KEY, btree (jti)

Foreign-key constraints:

"jwt\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)

olamohno=> \d beauty

Table "public.beauty"				
Column	Type	Collation	Nullable	Default
budget	double precision			
expenditure	double precision			
uid	uuid			

Foreign-key constraints:

"beauty\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)

olamohno=> \d culture

Table "public.culture"				
Column	Type	Collation	Nullable	Default
budget	double precision			
expenditure	double precision			
uid	uuid			

Foreign-key constraints:

"culture\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)

```
olamohno=> \d education
```

Table "public.education"				
Column	Type	Collation	Nullable	Default
budget	double precision			
expenditure	double precision			
uid	uuid			

Foreign-key constraints:

"education\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)

```
olamohno=> \d food
```

Table "public.food"				
Column	Type	Collation	Nullable	Default
budget	double precision			
expenditure	double precision			
uid	uuid			

Foreign-key constraints:

"food\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)

```
olamohno=> \d gift
```

Table "public.gift"				
Column	Type	Collation	Nullable	Default
budget	double precision			
expenditure	double precision			
uid	uuid			

Foreign-key constraints:

"gift\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)

```
olamohno=> \d health
```

Table "public.health"				
Column	Type	Collation	Nullable	Default
budget	double precision			
expenditure	double precision			
uid	uuid			

olamohno=> \d health

Table "public.health"				
Column	Type	Collation	Nullable	Default
budget	double precision			
expenditure	double precision			
uid	uuid			

Foreign-key constraints:

"health\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)

olamohno=> \d history

Table "public.history"				
Column	Type	Collation	Nullable	Default
uid	uuid			
tag	character varying		not null	
amount	real		not null	
remarks	character varying			
time	timestamp without time zone		not null	
group_details	json			

Foreign-key constraints:

"history\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)

olamohno=> \d household

Table "public.household"				
Column	Type	Collation	Nullable	Default
budget	double precision			
expenditure	double precision			
uid	uuid			

Foreign-key constraints:

"household\_uid\_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)

```

olamohno=> \d other
               Table "public.other"
  Column      |      Type      | Collation | Nullable | Default
-----+-----+-----+-----+-----
 budget      | double precision |           |          |
 expenditure  | double precision |           |          |
 uid          | uuid            |           |          |
Foreign-key constraints:
  "other_uid_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)

olamohno=> \d self_development
               Table "public.self_development"
  Column      |      Type      | Collation | Nullable | Default
-----+-----+-----+-----+-----
 budget      | double precision |           |          |
 expenditure  | double precision |           |          |
 uid          | uuid            |           |          |
Foreign-key constraints:
  "self_development_uid_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)

olamohno=> \d transport
               Table "public.transport"
  Column      | Type | Collation | Nullable | Default
-----+-----+-----+-----+-----
 uid          | uuid |           |          |
 budget      | real |           | not null |
 expenditure  | real |           | not null |
Foreign-key constraints:
  "transport_uid_fkey" FOREIGN KEY (uid) REFERENCES auth(uid)

```

## 8. TESTING

### a. Test Cases

S.no	Test Scenarios
	<b>Authentication</b>
1	Verify user is able to see login page
2	Verify user is able to loginto application or not?
3	Verify user is able to navigate to create your account page?
4	Veriify login page elements
	<b>Expense</b>
1	User after successful authentication can view the the time line?
2	Can user view the consolidated expenses in the form of pie chart?
3	Can user filter by date and view that specific expense by date?

Test case ID	Feature Type	Component	Test Scenario	Pre-Requirement	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Comments	TC for Automation(Y/N)	BUG ID
LoginPage_TC_OO1	Functional	Home Page	Verify user is able to see the Login/Signup popup when user clicked on My account button		1.Open the app 2.Incase of registered users,enter username and password. 3.If the user doesnt have an account,go over to register now	<a href="https://shopenzer.com/">https://shopenzer.com/</a>	1.Newly registered users are redirected to login page. 2.Existing users when entered the correct credentials get redirected to go timeline	Working as expected	Pass			
LoginPage_TC_OO2	UI	Home Page	Verify the UI elements in Login/Signup.		1.Open the application 2.Verify login/Signup with below UI elements: a.email text box b.password text box c.Dont have an account? register now	<a href="https://shopenzer.com/">https://shopenzer.com/</a>	Application should show below UI elements: a.email text box b.password text box c.Submit button with blue button d.Dont have an account? Register now	Working as expected	Fail	Steps are not clear to follow		BUG-1234



					d.New customer? Create account link							
LoginPage_TC_OO3	Functional	Home page	Verify user is able to log into application with Valid credentials		1.Open the application 2.Enter Valid email in Email text box 4.Enter valid password in password text box 5.Click on submit button	email:test@test.com password:abc	User should be navigated to the timeline	Works as expected	Pass			
LoginPage_TC_OO4	Functional	Login page	Verify user is able to log into application with Invalid credentials		1.Open the application 2.Enter Invalid username/email in Email text box 4.Enter Invalid password in password text box 5.Click on submit button	email:chalam@gmail.com password:xyz	Application should show 'Invalid Credentials' validation message.	Worked as expected				

TimeLine_ TL_OO1	Functional	TimeLine Page	Verify if the user is automatically redirected to timeline once the user completes authentication successfully		1.Open the application 2.Enter the valid credentials. 3.Wait	email:test@test.com password:abc	The user is redirected to the timeline page	Worked as expected	pass			
---------------------	------------	------------------	--	--	--	-------------------------------------	---	--------------------	------	--	--	--

## b. User Acceptance Testing

### 1. Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the Personal expense tracker project at the time of the release to User Acceptance Testing (UAT).

### 2. Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	2	0	0	0	2
External	0	2	0	1	3
Fixed	2	1	0	0	3
Skipped	0	1	0	0	1
Won't Fix	0	0	0	1	1
Totals	4	4	0	2	10

### 3. Test Case Analysis

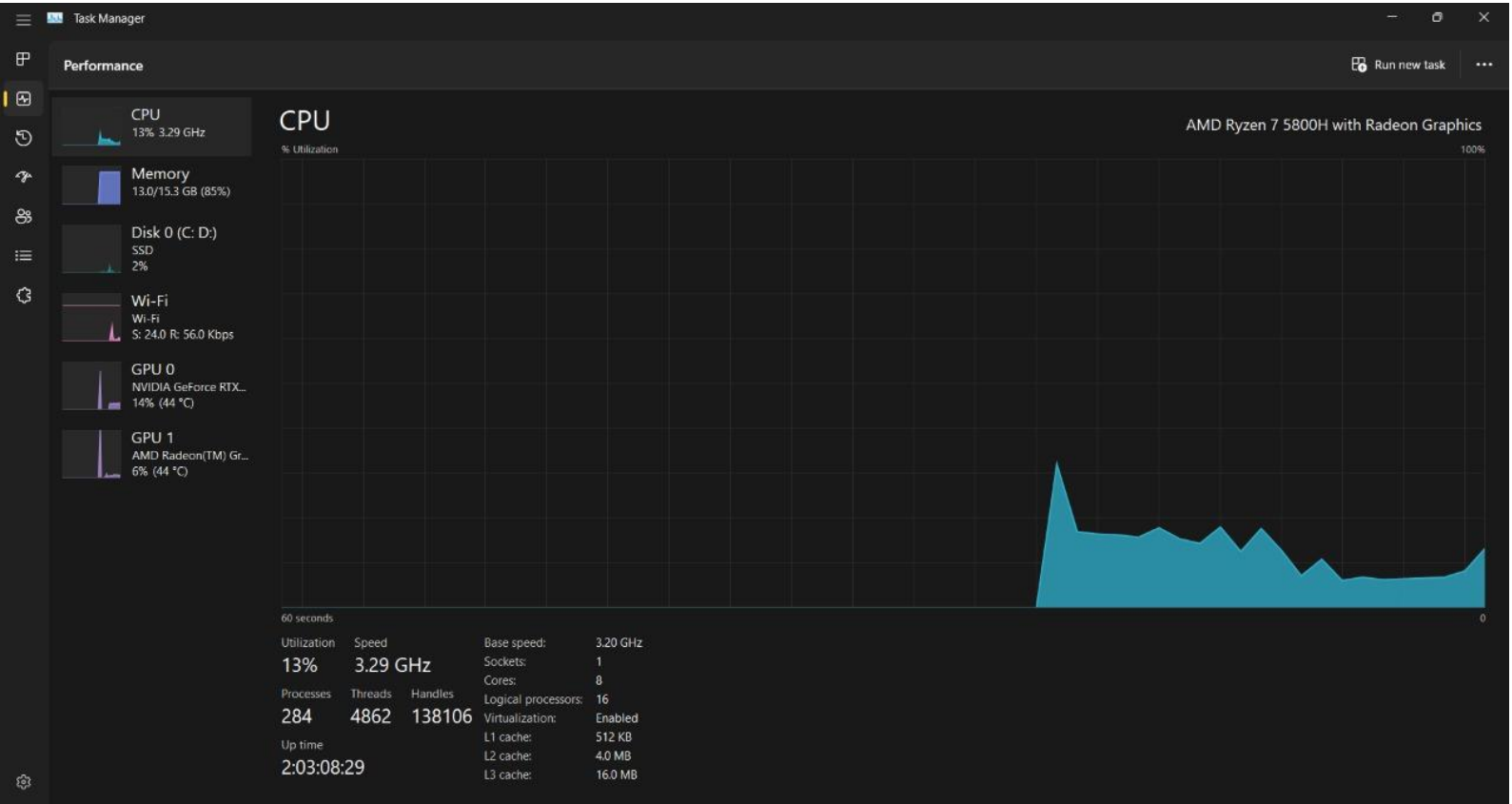
This report shows the number of test cases that have passed, failed, and untested

Section	Total Cases	Not Tested	Fail	Pass
UI	3	0	0	3
Database	2	0	0	2
Design	4	0	0	4
Deployment	1	0	1	0

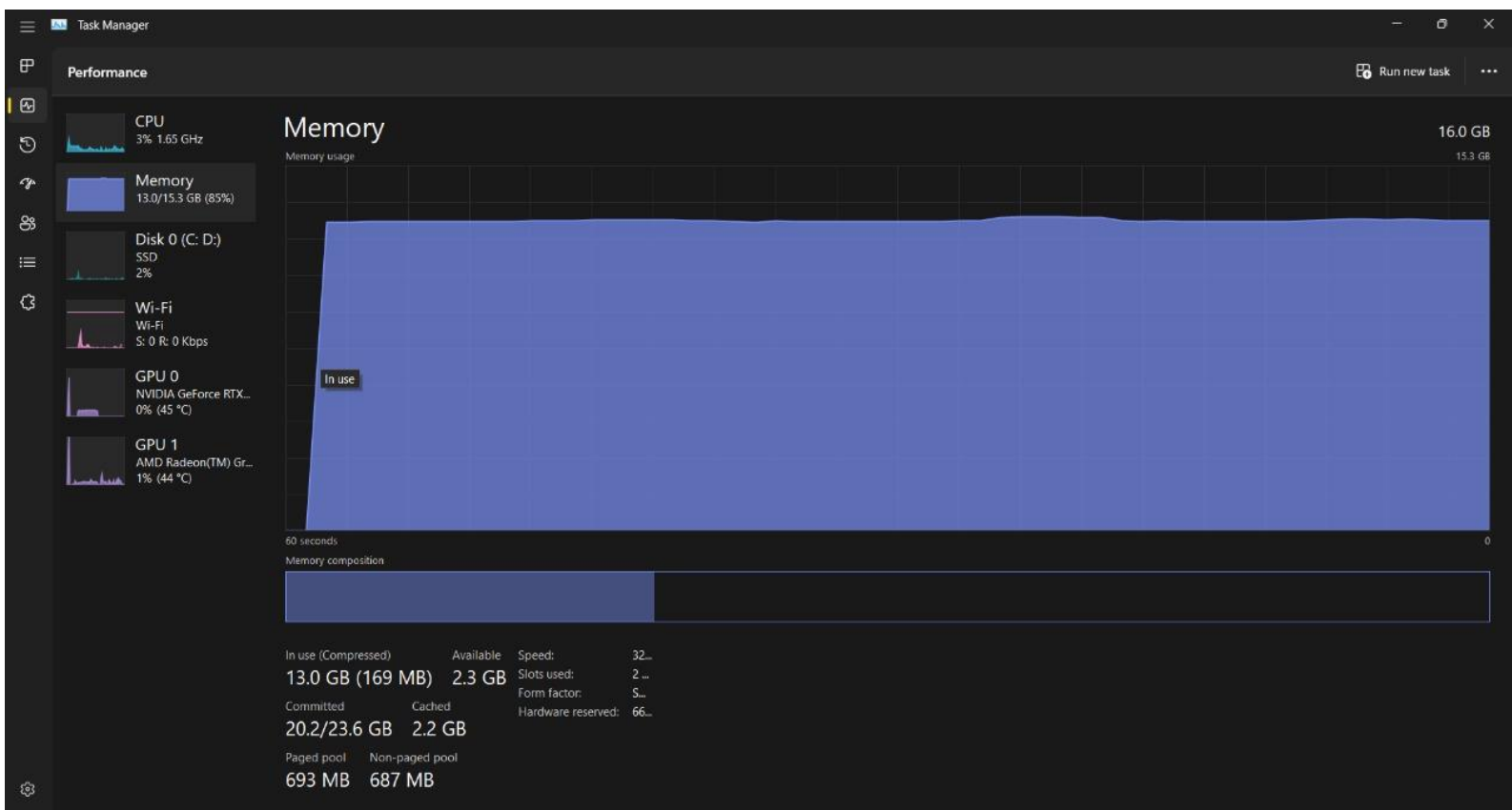
9. RESULTS

a. Performance Metrics

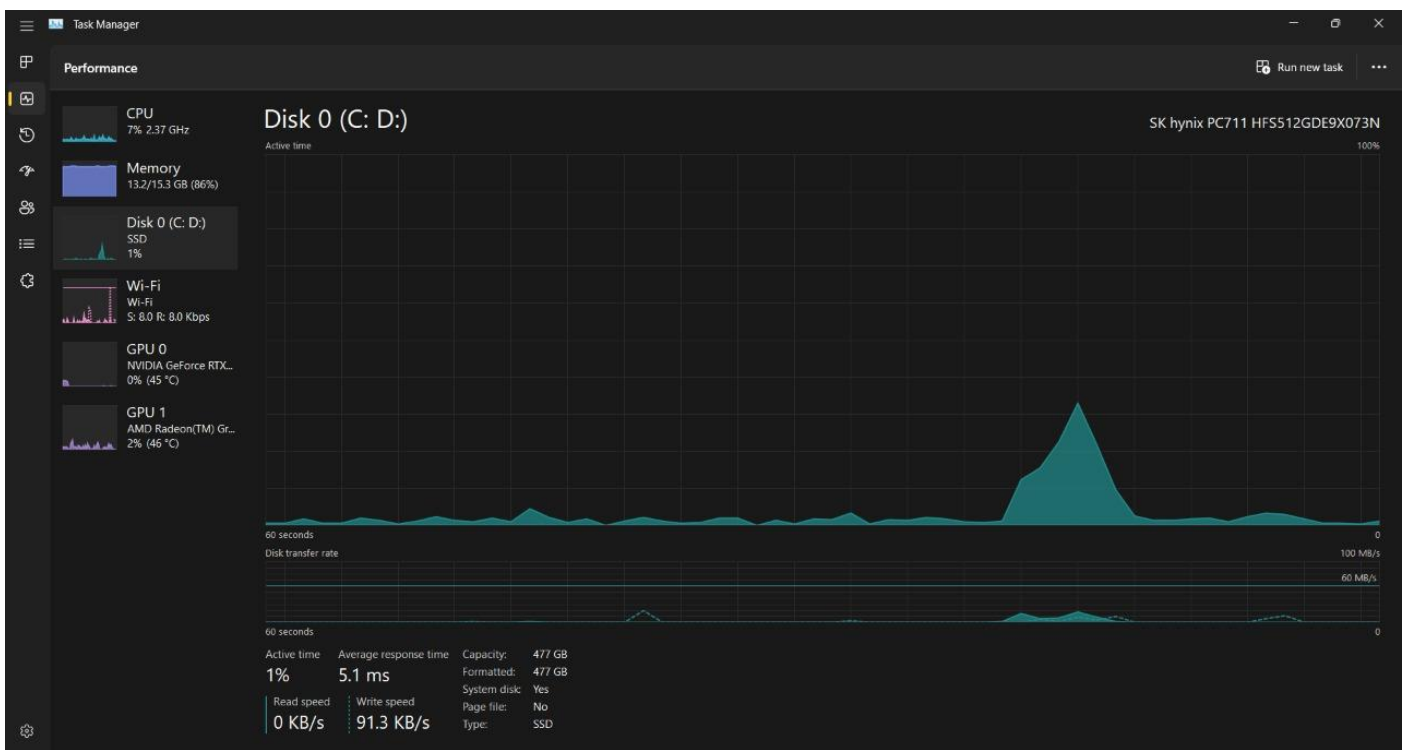
CPU Utilization:



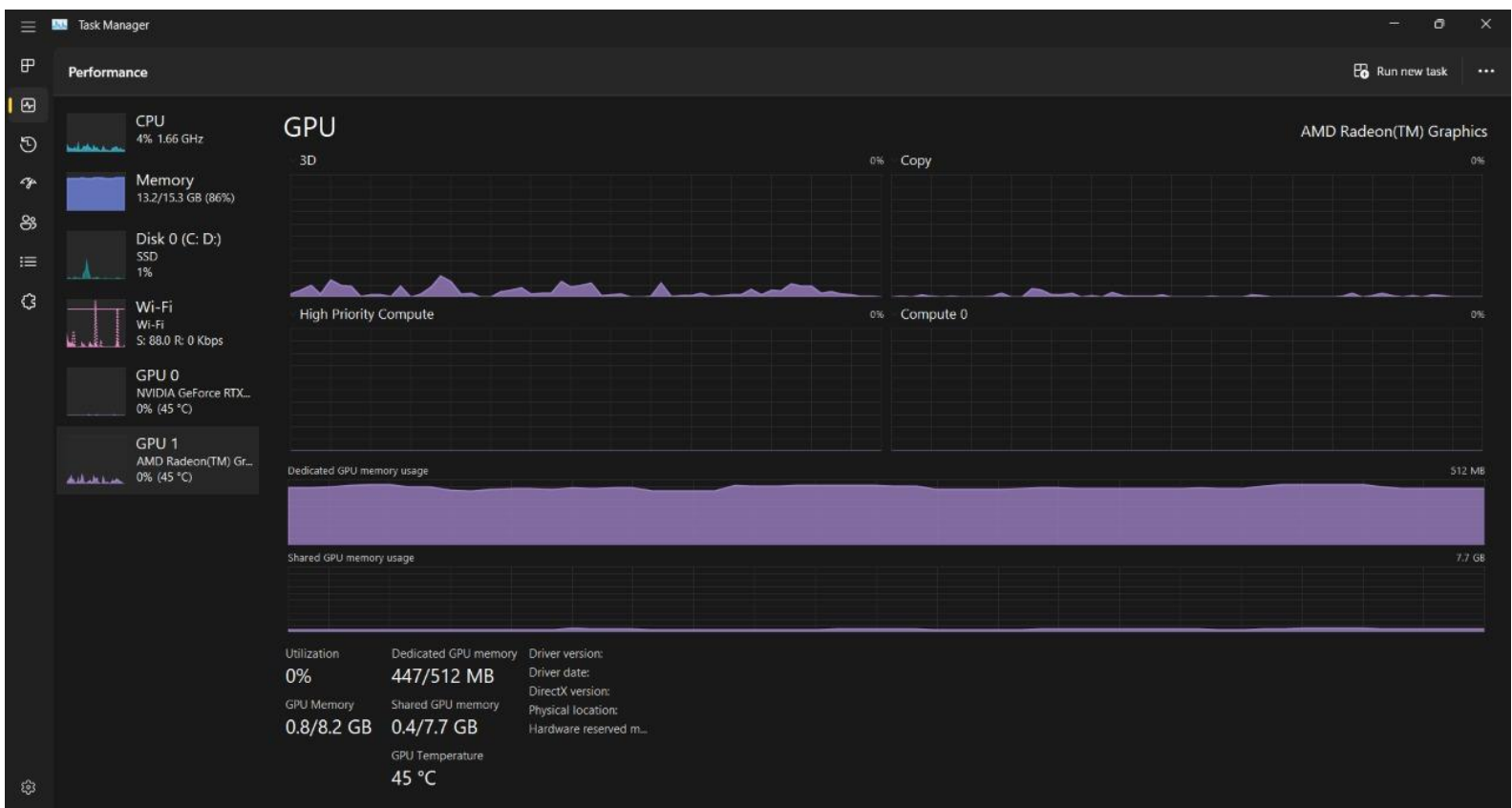
Memory Utilization:



Disc Utilization:



GPU Utilization:



10. ADVANTAGES & DISADVANTAGES

Advantages:

- 1) You will spend mindfully  
When you write down every expense it helps you spend more mindfully and prevents you from splurging. It makes you responsible with your spending.
- 2) Making financial control  
When you track your expenses, you take complete control over your finances. At any one time, you will know exactly how much money is sitting in your bank account, and how much you can spend.
- 3) Identify problem areas  
As you track your spending over time, you'll get a better idea of what's happening with your cash. Many of your daily expenses may seem really, but once you add up everything you spend on

dining out, coffee, lottery tickets, or whatever your indulgence is, you may be shocked to find out how much your habits actually cost.

4) Make a better budget

By tracking your expenses it will help you make clear budgets for your monthly spends. After you set up a budget, which is a monthly plan for spending that takes into account your income and expenses, tracking expenses daily is essential to keeping you on that budget

5) Tracking your financial progress

Tracking your expenses on a day-to-day basis helps you to see your progress on the road to your financial goals.

Tracking your expenses on a day-to-day basis helps you to see your progress on the road to your financial goals.

6) Keeping finances organized

Disorganized finances lead to financial problems. It is easier to stay organized than it is to organize a messy financial situation.

7) Improving financial security

It helps you track your bank accounts. What if somebody steals your debit card information and starts spending your money? If you have a track on your spends you avoid these risks.

8) Encourages and increases savings

When you track your expenses you are likely to find wasteful expenses you can eliminate. This will help you encourage and increase your savings. By eliminating wasteful expenses it opens up the opportunity to redirect that money into savings.

9) Avoids debt

Tracking your expenses can be a powerful motivator to steer clear of debt. When you are in debt, and not tracking your day-to-day expenses, it's easy to let the amount of debt you are paying each

month slip through the cracks, unnoticed. But, once you start tracking every dollar that leaves your bank account, you will start to add up the debt payments, and it can be eye-opening.

**Disadvantages:**

- Negligence during approval
- Due to the ease of being able to approve expense reports instantly at the click of a button, managers and approvers may sometimes be negligent. Although the software checks the reports for policy violations automatically, any violation that the software misses could be ignored by the approvers. Thus, some expense management software like Fyle offers multi-level approval workflow options.
- Negligence during auditing
- Although software simplifies the work of auditors, there is less scope for auditors to investigate suspicious activities. External verification can become minimal or redundant since all expense reports are already internally verified by the software. Due to this, auditors may choose to trust the software's discretion and neglect uncertainties. For avoiding such a situation, audit trails come in very handy. It helps keep every report audit-ready and traceable.
- Poor customer support
- Poor customer support can be a blocker for your operations when you experience glitches, need to set something up, or even if you just need to ask for information. It is, therefore, crucial to consider a software's customer service reputation while choosing it. Fyle, therefore, provides a detailed implementation plan during onboarding so you know exactly what is happening and when.
- Another important factor to consider while choosing an expense management software is to check customer reviews. After all, both your employees and finance teams have to be happy about the software.

## 11. CONCLUSION

Tracking your expenses daily can not only save your amount, but it can also assist you set

financial goals for the longer term. If you know exactly where your amount goes every month, you will easily see where some cutbacks and compromises can be made. The project that we have developed is more efficient than the other income and expense trackers. The project successfully avoids the manual calculation which is performed usually in the absence of an expense tracker. The modules are developed efficiently and also in an attractive manner. The application will eliminate sticky notes, spreadsheets, and ledgers that cause confusion, data inconsistency problems while recording and splitting expenses. With our application users can manage their expenses more effectively and they will be better at managing the expenses. Tracking the daily expenses can not only help in saving money but also help in setting financial goals for the future. If we know where our money is being spent every day, it is easy to set some cutbacks and such to help reduce expenditure. This project is developed to work more efficiently in comparison to other trackers and avoid manual calculation. It is developed to be efficient and look attractive at the same time.

## **12. FUTURE SCOPE**

- 1) It will have various options to keep record (for example Food, Travelling Fuel, Salary etc.).
- 2) Automatically it will keep on sending notifications for our daily expenditure.
- 3) In today's busy and expensive life, we are in a great rush to make moneys, but at the end of the month we broke off. As we are unknowingly spending money on title and unwanted things. So, we have come over with the plan to follow our profit.
- 4) Here user can define their own categories for expense type like food, clothing, rent and bills where they have to enter the money that has been spend and likewise can add some data in extra data to indicate the expense.

## **13. APPENDIX**

- a. GitHub & Project Demo Link:

<https://github.com/IBM-EPBL/IBM-Project-16952-1659625756>