MRK INSTITUTE OF TECHNOLOGY

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KATTUMANNARKOIL-608301, CUDDALORE DISTRICT, TAMILNADU - 608 301

PERSONAL EXPENSE TRACKER

A PROJECT REPORT

Submitted by

LOKHESH P (822419104021)

YOGESHWARAN S (82241910457)

NARASIMMAN N (822419104026)

KARUNAKARAN G (822419104019)

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TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER 1 INTRODUCTION

1.1 Project Overview

This project is based on expense tracking.This project aims to create an easy,faster and smooth cloud application .For better expense tracking we developed our project that will help the users a lot.Most of the people cannot track their expenses and income leading to facing money crisis,so this application can help people to track their expense day to day and make life stress free.Money is the most valuable portionof our daily life and without money we will not last one day on earth.So using the daily expense tracker application is important to lead a happy family.It helps the user to avoid unexpected expenses and bad financial situations.It will save time and provide a responsible lifestyle.

1.2 Purpose

Personal finance management is an important part of people's lives. However, everyone does not have the knowledge or time to manage their finances in a proper manner. And, even if a person has time and knowledge, they do not bother with tracking their expenses as they find it tedious and time-consuming. Now, you don't have to worry about managing your expenses, as you can get access to an expense tracker that will help in the active management of your finances.

Also known as expense manager and money manager, an expense tracker is a software or application that helps to keep an accurate record of your money inflow and outflow. Many people in India live on a fixed income, and they find that towards the end of the month they don't have sufficient money to meet their needs. While this problem can arise due to low salary, invariably it is due to poor money management skills.

People tend to overspend without realizing and this can prove to be disastrous. Using a daily expense manager can help you keep track of how much you spend every day and on what. At the end of the month, you will have a clear picture where your money is going. This is one of the best ways to get your expenses under control and bring some semblance of order to your finances.

CHAPTER 2
LITERATURE SURVEY

2.1 Existing problem

In a study conducted by For resterin 2016 surveying small and medium businesses (SMBs) across the world, 56% companies reported expense management as being the biggest challenge for their finance departments.

In another survey conducted by Level Research in 2018 in North America, respondents reported the following pain points in expense management before adopting automation:

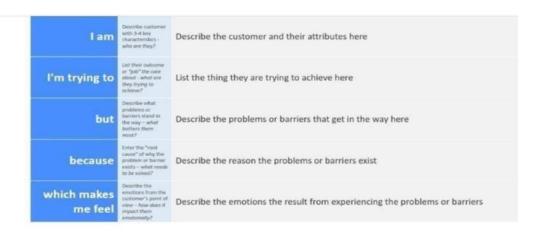I. Manual entry and routing of expense reports (62%)
II. Lack of visibility into spend data (42%)
III. Inability to enforce travel policies (29%)
IV. Lost expense reports (24%)
V. Inability to enforce travel policies (29%)
VI. Lost expense reports (24%)

2.2 References

S.No	TITLE	PROPOSED WORK	TOOLS USED/ ALGORITHM	TECHNOLOGY	ADVANTAGES/ DISADVANTAGES
1.	EXPENSE MANAGER APPLICATION. (2020)	To Develop A Moblie Application That Keeps Record Of User Personal Expenses Contribution In Group Expenditure Top Investment Options View Of The Current Stock Market ,Read Authenticated Financial News	Android Studio	Cloud Application	Advantages: ➢ Keeps Track All Of Your Daily Transactions, Keeps Track Of Your Money Lent Or Borrowed. Disadvantages: ➢ Occupy Lot Of Space.
2.	A NOVEL EXPENSE TRACKER USING STATISTICAL ANALYSIS. (2021)	To Maintain And Manage Data Of Daily Expenditure In A More Precise Way.	SQL Lite	Cloud Application	Advantages: ➢ Its Suggest You With The Most Effective Investment Options. Disadvantages: ➢ The Work Done Being Is Not Accurate.

S.No	TITLE	PROPOSED WORK	TOOLS USED/ ALGORITHM	TECHNOLOGY	ADVANTAGES/ DISADVANTAGES
3.	EXPENSE TRACKER. (2021)	Facilitates The User To Keep Track And Manage Their Personal As Well As Business Expenses.	Android OS	Cloud Application	Advantages: ➢ Become Aware Of Poor Spending Habits And Take Care Of Your Finances Saving And Investment. Disadvantages: ➢ Searching And Referencing Is Difficult And Time-consuming.
4.	EXPENSE TRACKER. (May 2021)	The Application Keeps The Track Of The Income And Expenses Both Of User On A Day To Day Bases	Java	Cloud Application	Advantages: ➢ The Project Effectively Keeps Away From The Manual Figuring. Disadvantages: ➢ Report Generation Is A Tedious Process.

1.3 Problem Statement Definition

Personal Expense Tracker Application:

Customer Problem Statement :

A well-articulated customer problem statement allows us to find the ideal solution for the challenges our customers face. Throughout the process, you'll also be able to empathize with your customers, which helps you better understand how they perceive your product or service.

Personal Expense Tracker Application:

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	an employee.	Make a monthly budget.	There are no facilities to set a budget.	I need to save money for my future plans.	Frustrated.
PS-2	A manager.	Keep track of my expenses.	Can't categorize the various types of expenses.	There is no option to organize the various expenses.	Uncomfortable.

CHAPTER 3

IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas

Empathy Map Canvas:

An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes.

It is a useful tool to helps teams better understand their users.
Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges.

3.2 Ideation & Brainstorming

Brainstorm & Idea Prioritization Template:

Brainstorming provides a free and open environment that encourages everyone within a teamto participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants areencouraged to collaborate, helping each other develop a rich amount of creative solutions.

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

Step-1: Team Gathering, Collaboration and Select the Problem Statement

Step-2: Brainstorm, Idea Listing and Grouping

Step-3: Idea Prioritization

Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

20 minutes

Importance

If each of these

tasks could get done without any difficulty or cost, which would have the most positive impact?

If the user spent high ,then send mail

Day to Day remainder about account balance via mail

If they logged in to the web app, we can send some alert

Feasibility

3.3 Proposed Solution

Project team shall fill the following information in proposed solution
template.

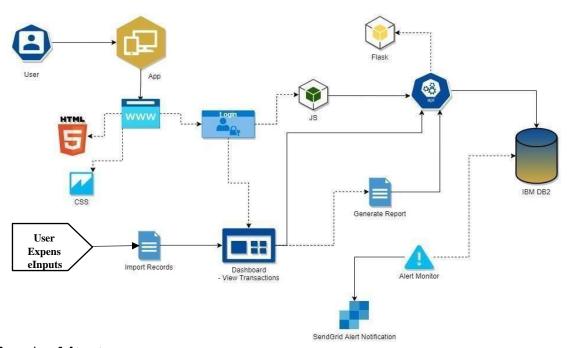| S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Earlier, our parents use to track all their expenses by writing down in a small notebook and calculating it on their own Even still many of them follow the same to maintain their financial expenses even some of them don't care of their expenses and spendings. Not only in our homes ,Expenses are need to be tracked in many large scale and small scale sectors such as in many schools, colleges, marketing companies , departmental stores , etc So in order to optimize their work and make peoples life easier our expense tracker application will be much helpful for Financial management The outcome of the application will be much useful for them to acknowledge the daily expenses and track the monthly expenses from their income with a limit to spend. They can easily track and view their expenses with a statistical data. In short, tracking our financial expenses is a great deal especially in this scenario so making those tracking easier is the job of this application.

2.	Idea / Solution description	Due to the busy and hectic lifestyle people tend to overlook their budget and end up spending an excessive amount of money since they usually didn't plan their budget wisely. user cannot predict future expenses. While they can write down their expenses in a excel spreadsheet, their lack of knowledge in managing finances will be a problem
3.	Novelty / Uniqueness	This application tracks your every expenses anywhere and anytime without using the paper work. Just click and enter your expenditure. to avoid data loss, quick settlements and reduce human error. To provide the pie chart or graph lines in this application.
4.	Social Impact / Customer Satisfaction	Using this application one can track their personal expenses and frame a monthly/annual budget. If your expense exceeded than specified limit, the application will show you an alert message in form of a pie chart.
5.	Business Model (Revenue Model)	Business people can use subscription/premium feature of this application to gain revenue.
6.	Scalability of the Solution	IBM cloud will automatically allocate thestorage for the users.

Solution Architecture

3.4 Problem Solution fit

Define CS, fit into CC	1. CUSTOMER SEGMENT(S) CS Who is your customer? Person who try to manage their expenses in an efficient way	6. CUSTOMER CONSTRAINTS CC What constraints prevent your customers from taking action or limit their choices? No Internet Connection	5. AVAILABLE SOLUTIONS AS 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? Note & pen system, Mind Calculation	Explore AS, differentiate
Focus on J&P, tap into BE, understand RC	2. JOBS-TO-BE-DONE / PROBLEMS J&P Which jobs-to-be-done (or problems) do you address for your customers? • Large manual calculations are need to calculate the monthly expenses • Human error may be happen	9. PROBLEM ROOT CAUSE RC What is the real reason that this problem exists? What is the back story behind the need to do this job? • Lack of tracking their expenses • No graphical representation to track their expenses	7. BEHAVIOUR BE What does your customer do to address the problem and get the job done? Easier for the user to follow the process of tracking expenses	Focus on J&P, tap into BE, understand RC

3. TRIGGERS

TR

What triggers customers to act?

It reduces time rather than writing it manually in the notebook

4. EMOTIONS: BEFORE / AFTER

How do customers feel when they face a problem or a job and afterward?

Before: Difficult to track the expense and struggle to analyze **their expenses after spending it**

After: Easy to track the expenses and graphical representation allow them to understand the expenses they **made before easily**

8. CHANNELS of BEHAVIOUR

8.1 ONLINE
What kind of actions do customers take online?

- Tracking their expenses
- Getting detailed reviews from email notification

8.2 OFFLINE
What kind of actions do customers take offline?

Export the data when online and use it in offline

10. YOUR SOLUTION

SL

- Create a web application to track their expenses anywhere at any time
- Get real-time graphical representation of their expenses
- Alert notification through email

CHAPTER 4
REQUIREMENT ANALYSIS

4.1 Functional requirements

FR No.	Functional Requirement	Description
FR-1	**Register**	Registration is the process of the user to complete the application's form. Certain details must be submitted such as e-mail address, password, and password confirmation. The user is identified using these details.
FR-2	**Login**	The login screen is used to verify the identity of the user. The account can be accessed using the user's registered email address and password.
FR-3	**Categories**	On the main page, we can see overall revenue and spending, as well as the balance remaining after expenditure, as well as the user's entire categories namely Entertainment, Cloth, Food and Drinks, Health and Fitness and so on.
FR-4	**Update Daily Expensive**	The user can upload the daily expensive details what they are spending on each day. The details such as cloth, entertainment, food, health etc.,

FR-5	**View Expensive Chart**	This module used to see a pictorial depiction of all details in the form of a pie chart, where each slice of the pie chart represents that the viewer to gain an approximatenotion of which category has the highest expenses.
NFR-6	**Set Alert**	When a user attempts to spend more than the pre-defined amount limit, the app will automatically send an alert if the threshold amount they selected for an alert is exceeded.

4.2 Non-Functional requirements

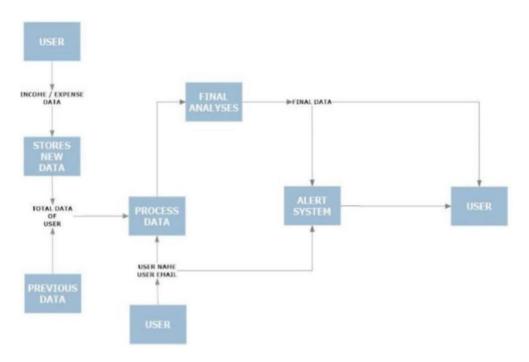| NFR No.	**Non-Functional Requirement**	**Description**
NFR-1	**Usability**	The system shall allow the users to access the system with pc using web application. The system uses a web application as an interface. The system is user friendly which makes the system easy.
NFR-2	**Security**	A security requirement is a statement of needed security functionality that ensures one of many different security properties of software is being satisfied.

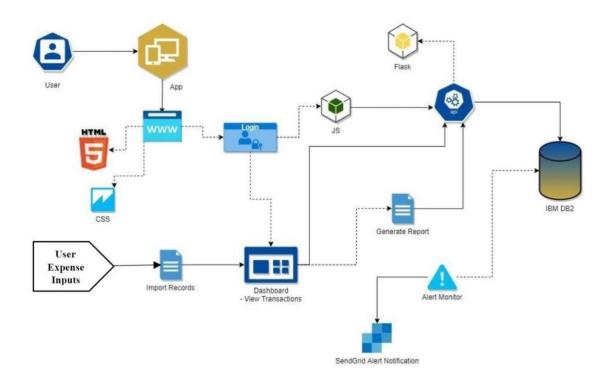| NFR-3	**Reliability**	he system has to be 100% reliable due to the importance of data and the damages that can be caused by incorrect or incomplete data. The system will run 7 days a week. 24 hours a day.
NFR-4	**Performance**	The information is refreshed depending upon whether some updates have occurred or not in the application. The system shall respond to the member in not less than two seconds from the time of the request submittal. The system shall be allowed to take more time when doing large processing jobs. Responses to view information shall take no longer than 5 seconds to appear on the screen.
NFR-5	**Availability**	The system is available 100% for the user and isused 24 hrs a day and 365 days a year. The system shallbe operational 24 hours a day and 7 days a week.
NFR-6	**Scalability**	Scalability is the measure of a system's ability toincrease or decrease in performance and cost in response to changes in application and system processing demands.

CHAPTER 5

PROJECT DESIGN

5.1 Data Flow Diagrams

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows withina system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.

5.2 Solution & Technical Architecture

5.3 User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptanc ecriteria	Priority
Customer (web user)	Registration	USN-1	As a user, I can register for the application by entering mail id and password	I can access myaccount/ dashboard	High
		USN-2	As a user,I will receive a confirmation email once I have registered for the email and click application	I can receive a confirmation email	High
		USN-3	As a user, I can access using mail	I can register through mail	Low
	Login	USN-4	As a user, I can login application by entering application using email and password	I can access theapplication	High
	Dashboard	USN-5	As a user,I can view my income and expenditure details	I can view mydaily expenses	High
Customer care executive		USN-6	As a customer care executive, I can solve the login issue and other issues of the solution at any application	I can provide support	Medium
Administrator	Application	USN-7	As an administrator,I can upgrade or update the application	I can fix the bug	Medium

CHAPTER 6
PROJECT PLANNING & SCHEDULING

6.1 Sprint Planning & Estimation

S.NO	MILESTONES	ACTIVITIES	DATE
1.	**Preparation Phase**	Pre-requisites	24 Aug 2022
		Prior Knowledge	25 Aug 2022
		Project Structure	23 Aug 2022
		Project Flow	23 Aug 2022
		Project Objectives	22 Aug 2022
		Registrations	26 Aug 2022
		Environment Set- up	27 Aug 2022
	Ideation Phase	Literature Survey	29 Aug 2022
2.			– 03 Sept 2022
		Empathy Map	5 Sept 2022 - 7 Sept 2022

		Problem Statement	8 Sept 2022 - 10 Sept 2022
		Ideation	12 Sept 2022 – 16 Sept 2022
3.	**Project Design Phase-1**	Proposed Solution	19 Sept 2022 – 23 Sept 2022
		Problem Solution Fit	24 Sept 2022 – 26 Sept 2022
		Solution Architecture	27 Sept 2022 – 30 Sept 2022
4.	**Project Design Phase – 2**	Customer Journey Map	03 Oct 2022 – 08 Oct 2022
		Requirement Analysis	09 Oct2022 – 11 Oct 2022
		Data Flow Diagrams	11 Oct 2022 – 14 Oct 2022
		Technology Architecture	15 Oct 2022- 16 Oct 2022

5.	**Project Planning Phase**	Milestones & Task	17 Oct 2022 – 18 Oct 2022
		Sprint Schedules	19 Oct 2022– 22 Oct 2022
6.	**Project Development Phase**	Sprint - 1	24 Oct 2022 – 29 Oct 2022
		Sprint – 2	31 Oct 2022 – 05 Nov 2022
		Sprint – 3	07 Nov 2022 – 12 Nov 2022
		Sprint – 4	14 Nov 2022 – 19 Nov 2022

6.2 Sprint Delivery Schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint 1	Registration	US N-1	As a user, I can register for the application by entering my email, password, and confirming my password.	2	High	LOKHESH
		US N-2	As a user, I will receive confirmation email once I have registered for the application	1	High	YOGESHWARAN
	Login	US N-3	As a user, I can log into the application by entering email &password	1	High	NARASIMMAN
	Dashboard	US N-4	Logging in takes to the dashboard for the logged user.	`2	High	KARUNAKARAN
*Bug fixes, routine checks and improvisation by everyone in the team *Intended bugs only*						
Sprint 2	Workspace	US N-1	Workspace for personal expense tracking	2	High	LOKHESH
	Charts	US N-2	Creating various graphs and statistics of customer's data	1	Medium	YOGESHWARAN
	Connecting to IBM DB2	US N-3	Linking database with dashboard	2	High	NARASIMMAN
		US N-4	Making dashboard interactive with JS	2	High	KARUNAKARAN

PNT2022TMID03137

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

Sprint		US N		Points	Priority	Assignee
Sprint-3		US N-1	Wrapping up the server side works of frontend	1	Medium	NITIN
	Watson Assistant	US N-2	Creating Chatbot for expense tracking and for clarifying user'squery	1	Medium	NIYAZ
	SendGrid	US N-3	Using SendGrid to send mail to the user about their expenses	1	Low	NIVETHA
		US N-4	Integrating both frontend and backend	2		NITHYA
Bug fixes, routine checks and improvisation by everyone in the team *Intended bugs only					
Sprint-4	Docker	US N-1	Creating image of website using docker/	2	High	NIVETHA
	Cloud Registry	US N-2	Uploading docker image to IBM Cloud registry	2	High	NITIN
	Kubernetes	US N-3	Create container using the docker image and hosting the site	2	High	NITHYA
	Exposing	US N-4	Exposing IP/Ports for the site	2	High	NIYAZ

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

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).

$$AV = \text{sprint duration} = 20 / 6 = 3.33 \text{ velocity}$$

CHAPTER 7
CODING & SOLUTIONING

app.py:

```
# -*- coding: utf-8 -
*-"""

Spyder Editor
This is a temporary
script file.""" from flask
import Flask,
render_template, request,
redirect, session# from
flask_mysqldb import
MySQL
# import
MySQLdb.cursorsimport
re from flask_db2
import DB2import
ibm_db import
ibm_db_dbi
from sendemail import sendgridmail,sendmail

# from gevent.pywsgi
import WSGIServerimport
os app = Flask(__name__)


app.secret_key = 'a'

# app.config['MYSQL_HOST'] =
'remotemysql.com'# app.config['MYSQL_USER']
= 'D2DxDUPBii'
# app.config['MYSQL_PASSWORD'] =
'r8XBO4GsMz'# app.config['MYSQL_DB'] =
'D2DxDUPBii'
"""  dsn_hostname  =  "3883e7e4-18f5-4afe-
be8c-
```

```python
fa31c41761d2.bs2io90l08kqb1od8lcg.databases.appdomain.cloud
" dsn_uid = "sbb93800" dsn_pwd = "wobsVLm6ccFxcNLe"
dsn_driver = "{IBM DB2 ODBC DRIVER}"dsn_database =
"bludb" dsn_port = "31498"
dsn_protocol = "tcpip"

dsn = (
    "DRIVER={0};"
    "DATABASE={1};"
    "HOSTNAME={2};"
    "PORT={3};"
    "PROTOCOL={4};"
    "UID={5};"
    "PWD={6};"
).format(dsn_driver, dsn_database, dsn_hostname, dsn_port, dsn_protocol, dsn_uid,
dsn_pwd)
"""
# app.config['DB2_DRIVER'] = '{IBM DB2 ODBC DRIVER}' app.config['database']
= 'bludb'
app.config['hostname'] = '3883e7e4-18f5-4afe-be8c-
fa31c41761d2.bs2io90l08kqb1od8lcg.databases.appdomain.clou
d' app.config['port'] = '31498' app.config['protocol'] = 'tcpip'
app.config['uid'] = 'sbb93800' app.config['pwd'] =
'wobsVLm6ccFxcNLe'
app.config['security'] = 'SSL' try:
    mysql = DB2(app)


    conn_str='database=bludb;hostname=3883e7e4-18f5-4afe-be8c-
fa31c41761d2.bs2io90l08kqb1od8lcg.databases.appdomain.cloud;port=31498;protocol=tc
p i p;\
        uid=sbb93800;pwd=wobsVLm6ccFxcNLe;security=SSL'
    ibm_db_conn = ibm_db.connect(conn_str,'','')


    print("Database connected without any error !!")except:
    print("IBM DB Connection error : " + DB2.conn_errormsg())

# app.config["]
```

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```python
# mysql = MySQL(app) #HOME--PAGE

@app.route("/home") def

home():

    return render_template("homepage.html")
@app.route("/" )def add(): return

render_template("home.html")

#SIGN--UP--OR--REGISTER

@app.route("/signup") def

signup():

    return          render_template("signup.html")
  @app.route('/register', methods =['GET', 'POST']
  def register: msg ="
      print("Break point1")

    if request.method == 'POST' : username

      =   request.form['username']email  =

      request.form['email']    password    =

      request.form['password']

    print("Break point2" + "name: " + username + "------" + email + "     " + password)

            try:

        print("Break    point3")    connectionID    =

        ibm_db_dbi.connect(conn_str, ',

        ")cursor = connectionID.cursor() print("Break

      point4")except:

        print("No connection Established")


      # cursor =

      mysql.connection.cursor() # with

      app.app_context(): #

            print("Break point3")

      #    cursor = ibm_db_conn.cursor()

      # print("Break   point4")   print("Break

        point5")

      sql = "SELECT * FROM register WHERE username =
```

```
?"stmt = ibm_db.prepare(ibm_db_conn, sql) ibm_db.bind_param(stmt, 1,
username) ibm_db.execute(stmt) result = ibm_db.execute(stmt) print(result)
account = ibm_db.fetch_row(stmt) print(account) param = "SELECT * FROM
register WHERE username = " + "\"" + username +
"\""res = ibm_db.exec_immediate(ibm_db_conn, param)
print(" ---") dictionary = ibm_db.fetch_assoc(res) while
dictionary != False: print("The ID is : ",
    dictionary["USERNAME"])dictionary = ibm_db.fetch_assoc(res)

# dictionary = ibm_db.fetch_assoc(result)
# cursor.execute(stmt)


# account = cursor.fetchone()
# print(account)

# while ibm_db.fetch_row(result) != False:
#     # account = ibm_db.result(stmt)
#       print(ibm_db.result(result, "username"))
#
print(dictionary["username"]
) print("break point 6") if
account:
    msg = 'Username already exists !'
elif not re.match(r'[^@]+@[^@]+\.[^@]+', email):msg
    = 'Invalid email address !'
elif not re.match(r'[A-Za-z0-9]+', username):
    msg = 'name must contain only characters and numbers !'
else:
    sql2 = "INSERT INTO register (username, email,password) VALUES (?, ?,
    ?)"stmt2 = ibm_db.prepare(ibm_db_conn, sql2)
    ibm_db.bind_param(stmt2, 1, username)
    ibm_db.bind_param(stmt2, 2, email)
    ibm_db.bind_param(stmt2, 3, password)
```

```
        ibm_db.execute(stmt2)

        # cursor.execute('INSERT INTO register VALUES (NULL, % s, % s, %
s)',(username,          email,password))          #

        mysql.connection.commit()  msg  =  'You

        have successfully registered !'

    return render_template('signup.html', msg = msg)
#LOGIN--PAGE
@app.route("/signin" )def

signin():

   return render_template("login.html")
@app.route('/login',methods =['GET', 'POST'])def

login():

   global  userid  msg

   = ''

   if request.method == 'POST' : username

     =  request.form['username']password

     = request.form['password'] # cursor =

     mysql.connection.cursor()

     # cursor.execute('SELECT * FROM register WHERE username = % s AND password
     =
% s', (username, password ),)

     # account = cursor.fetchone()

     # print (account) sql = "SELECT * FROM register WHERE username = ?

     and    password   =   ?"   stmt   =   ibm_db.prepare(ibm_db_conn,   sql)

     ibm_db.bind_param(stmt, 1, username)

     ibm_db.bind_param(stmt, 2,

     password) result =

     ibm_db.execute(stmt) print(result)

     account = ibm_db.fetch_row(stmt)

     print(account)

      param = "SELECT * FROM register WHERE username = " + "\"" + username + "\"" +
"and  password  =  "  +  "\""  +  password  +  "\""  res  =

     ibm_db.exec_immediate(ibm_db_conn,         param)

     dictionary = ibm_db.fetch_assoc(res)
```

```python
    # sendmail("hello sakthi","sivasakthisairam@gmail.com")
if account:

        session['loggedin'] = True  session['id'] =

        dictionary["ID"]userid = dictionary["ID"]

        session['username']                        =

        dictionary["USERNAME"]session['email'] =

        dictionary["EMAIL"]                return

        redirect('/home')

    else:

        msg = 'Incorrect username / password !' return
    render_template('login.html',  msg  =  msg)
    #ADDING-- DATA

@app.route("/add") def

adding():

    return render_template('add.html')

@app.route('/addexpense',methods=['GET', 'POST']) def

addexpense():

    date = request.form['date'] expensename =

    request.form['expensename']  amount  =

    request.form['amount']    paymode    =

    request.form['paymode']    category    =

    request.form['category']

    print(date) p1 = date[0:10] p2 =

    date[11:13] p3 = date[14:] p4 = p1

    + "-" + p2 + "." + p3 + ".00"

    print(p4)

    # cursor = mysql.connection.cursor()

    # cursor.execute('INSERT INTO expenses VALUES (NULL, % s, % s, % s, % s, % s, %
s)', (session['id'] ,date, expensename, amount, paymode, category))

    # mysql.connection.commit()

    # print(date + " " + expensename + " " + amount + " " + paymode + " " + category)

    sql = "INSERT INTO expenses (userid, date, expensename, amount, paymode, category)
VALUES  (?,  ?,  ?,  ?,  ?,  ?)"  stmt  =

    ibm_db.prepare(ibm_db_conn,        sql)
```

```
ibm_db.bind_param(stmt, 1, session['id'])

ibm_db.bind_param(stmt,      2,      p4)

ibm_db.bind_param(stmt,                3,

expensename)  ibm_db.bind_param(stmt,

4, amount) ibm_db.bind_param(stmt, 5,

paymode)  ibm_db.bind_param(stmt,  6,

category) ibm_db.execute(stmt)


print("Expenses added")
# email part
param = "SELECT * FROM expenses WHERE userid = " + str(session['id']) + " AND
MONTH(date) = MONTH(current timestamp) AND YEAR(date) = YEAR(current
timestamp)ORDER BY date DESC"

res = ibm_db.exec_immediate(ibm_db_conn, param)

dictionary = ibm_db.fetch_assoc(res) expense = []

while     dictionary   !=    False:temp   =   []

temp.append(dictionary["ID"])

temp.append(dictionary["USERID"])

temp.append(dictionary["DATE"])

temp.append(dictionary["EXPENSENAME"])

temp.append(dictionary["AMOUNT"])

temp.append(dictionary["PAYMODE"])

temp.append(dictionary["CATEGORY"])

expense.append(temp)  print(temp)  dictionary  =

ibm_db.fetch_assoc(res)

total=0  for  x  in

expense:    total

+= x[4] param =

"SELECT    id,

limitss   FROM

limits  WHERE

userid  =  "  +

str(session['id'])

+ "

ORDER  BY  id  DESC  LIMIT  1"  res  =

ibm_db.exec_immediate(ibm_db_conn, param)
```

```
    dictionary = ibm_db.fetch_assoc(res)

    row  =  []s  =  0  while  dictionary  !=

    False:temp                 =                []

    temp.append(dictionary["LIMITSS"])

    row.append(temp)         dictionary        =

    ibm_db.fetch_assoc(res) s = temp[0]

    if total > int(s):

        msg = "Hello " + session['username'] + " , " + "you have crossed the monthly limit of
Rs." + s + "/- !!!" + "\n" + "Thank you, " + "\n" + "Team Personal Expense Tracker."
sendmail(msg,session['email'])
    return redirect("/display")

#DISPLAY---graph
@app.route("/display"
)def display():
    print(session["username"],session['id'])


    # cursor = mysql.connection.cursor()

    # cursor.execute('SELECT * FROM expenses WHERE userid = % s AND date ORDER
BY `expenses`.`date` DESC',(str(session['id'])))

    # expense = cursor.fetchall()
    param = "SELECT * FROM expenses WHERE userid = " + str(session['id']) + " ORDER
BY date DESC"
    res = ibm_db.exec_immediate(ibm_db_conn, param)

    dictionary  =  ibm_db.fetch_assoc(res) expense  =  []

    while      dictionary     !=     False:temp     =     []

    temp.append(dictionary["ID"])

    temp.append(dictionary["USERID"])

    temp.append(dictionary["DATE"])

    temp.append(dictionary["EXPENSENAME"])

    temp.append(dictionary["AMOUNT"])

    temp.append(dictionary["PAYMODE"])

    temp.append(dictionary["CATEGORY"])

    expense.append(temp)   print(temp)   dictionary   =

    ibm_db.fetch_assoc(res)

    return render_template('display.html' ,expense = expense)
```

PNT2022TMID03137

```python
#delete---the--data
@app.route('/delete/<string:id>', methods = ['POST', 'GET' ])def

delete(id):

    # cursor = mysql.connection.cursor()

    # cursor.execute('DELETE FROM expenses WHERE id = {0}'.format(id))#

    mysql.connection.commit()


    param = "DELETE FROM expenses WHERE id = " + id

    res  =  ibm_db.exec_immediate(ibm_db_conn,  param)

    print('deleted successfully')

  return redirect("/display")

#UPDATE---DATA
@app.route('/edit/<id>', methods = ['POST', 'GET' ])def

edit(id):

    # cursor = mysql.connection.cursor()

    # cursor.execute('SELECT * FROM expenses WHERE id = %s', (id,))

    # row = cursor.fetchall() param = "SELECT * FROM

    expenses   WHERE   id   =   "   +   id   res   =

    ibm_db.exec_immediate(ibm_db_conn, param) dictionary

    = ibm_db.fetch_assoc(res) row = [] while dictionary !=

    False:temp     =     []     temp.append(dictionary["ID"])

    temp.append(dictionary["USERID"])

    temp.append(dictionary["DATE"])

    temp.append(dictionary["EXPENSENAME"])

    temp.append(dictionary["AMOUNT"])

    temp.append(dictionary["PAYMODE"])

    temp.append(dictionary["CATEGORY"])

    row.append(temp) print(temp)

        dictionary = ibm_db.fetch_assoc(res)


    print(row[0]) return render_template('edit.html',

    expenses = row[0]) @app.route('/update/<id>',

    methods = ['POST']) def update(id):

  if request.method == 'POST' :
```

```
    date = request.form['date'] expensename =

    request.form['expensename']    amount    =

    request.form['amount']       paymode      =

    request.form['paymode']        category      =

    request.form['category']


  # cursor = mysql.connection.cursor()

  # cursor.execute("UPDATE `expenses` SET `date` = % s , `expensename` = % s ,
`amount` = % s, `paymode` = % s, `category` = % s WHERE `expenses`.`id` = % s ",(date,
expensename, amount, str(paymode), str(category),id))

    # mysql.connection.commit()
p1 = date[0:10] p2 = date[11:13] p3 = date[14:] p4

      = p1 + "-" + p2 + "." + p3 + ".00"

    sql = "UPDATE expenses SET date = ? , expensename = ? , amount = ?, paymode = ?,
category  =  ?  WHERE  id  =  ?"  stmt  =

    ibm_db.prepare(ibm_db_conn,          sql)

    ibm_db.bind_param(stmt,       1,        p4)

    ibm_db.bind_param(stmt, 2, expensename)

    ibm_db.bind_param(stmt,    3,     amount)

    ibm_db.bind_param(stmt,    4,    paymode)

    ibm_db.bind_param(stmt,    5,    category)

    ibm_db.bind_param(stmt,        6,        id)

    ibm_db.execute(stmt)     print('successfully

    updated') return redirect("/display"


  #limit

  @app.route("/limit" )def

  limit():

      return redirect('/limitn')
  @app.route("/limitnum" , methods = ['POST' ])def

  limitnum():

    if request.method == "POST":

      number= request.form['number']

    # cursor = mysql.connection.cursor()

    # cursor.execute('INSERT INTO limits VALUES (NULL, % s, % s) ',(session['id'],
number))

      # mysql.connection.commit()
```

```
        sql = "INSERT INTO limits (userid, limitss) VALUES (?,

        ?)"stmt = ibm_db.prepare(ibm_db_conn, sql)

        ibm_db.bind_param(stmt,    1,    session['id'])

        ibm_db.bind_param(stmt,     2,      number)

        ibm_db.execute(stmt)                    return

        redirect('/limitn')

        @app.route("/limitn") def limitn():

      # cursor = mysql.connection.cursor()

    # cursor.execute('SELECT limitss FROM `limits` ORDER BY `limits`.`id` DESC LIMIT

    1')# x= cursor.fetchone()

    # s = x[0]
    param = "SELECT id, limitss FROM limits WHERE userid = " + str(session['id']) + "
ORDER   BY   id   DESC   LIMIT   1"   res   =

    ibm_db.exec_immediate(ibm_db_conn,        param)

    dictionary = ibm_db.fetch_assoc(res) row =

    []s = "

    /-"

    while  dictionary  != False:temp  =  []

        temp.append(dictionary["LIMITSS"]

        )  row.append(temp)  dictionary   =

        ibm_db.fetch_assoc(res) s = temp[0]


    return render_template("limit.html" , y= s)
#REPORT
@app.route("/today" )def

today():

      # cursor = mysql.connection.cursor()

    # cursor.execute('SELECT TIME(date) , amount FROM expenses WHERE userid =
%s AND DATE(date) = DATE(NOW())

    ',(str(session['id'])))# texpense = cursor.fetchall()

    # print(texpense) param1 = "SELECT TIME(date) as tn, amount FROM expenses
      WHERE userid = " +
str(session['id']) + " AND DATE(date) = DATE(current timestamp) ORDER BY date
DESC" res1 =  ibm_db.exec_immediate(ibm_db_conn,

      param1)   dictionary1    =   ibm_db.fetch_assoc(res1)

      texpense = []
```

```python
    while  dictionary1  !=  False:temp  =  []

      temp.append(dictionary1["TN"])

      temp.append(dictionary1["AMOUNT"]

      )  texpense.append(temp)  print(temp)

      dictionary1 = ibm_db.fetch_assoc(res1)

  # cursor = mysql.connection.cursor()

  # cursor.execute('SELECT * FROM expenses WHERE userid = % s AND DATE(date) =
DATE(NOW()) AND date ORDER BY `expenses`.`date` DESC',(str(session['id'])))

  # expense = cursor.fetchall() param = "SELECT * FROM expenses WHERE
userid = " + str(session['id']) + " ANDDATE(date) = DATE(current timestamp)
ORDER BY date DESC" res = ibm_db.exec_immediate(ibm_db_conn, param)
dictionary = ibm_db.fetch_assoc(res) expense = [] while dictionary != False:temp =
[]

      temp.append(dictionary["ID"])

    temp.append(dictionary["USERID"])

    temp.append(dictionary["DATE"])

    temp.append(dictionary["EXPENSENAME"])

    temp.append(dictionary["AMOUNT"])

    temp.append(dictionary["PAYMODE"])

    temp.append(dictionary["CATEGORY"])

    expense.append(temp) print(temp) dictionary =

    ibm_db.fetch_assoc(res) total=0

    t_food=0

    t_entertainment=0

    t_business=0

    t_rent=0    t_EMI=0

    t_other=0  for  x  in

    expense:   total   +=

    x[4]   if   x[6]   ==

    "food":

        t_food += x[4] elif x[6]

      ==          "entertainment":

      t_entertainment  +=  x[4]
```

```python
        elif  x[6]  ==  "business":

        t_business += x[4]

        elif x[6] ==

            "rent":t_rent +=

            x[4]


        elif x[6] ==

            "EMI":t_EMI +=

            x[4]

elif x[6] ==

            "other":t_other +=

            x[4]
print(total) print(t_food)

        print(t_entertainment

        ) print(t_business)

        print(t_rent)

        print(t_EMI) print(t_other

        )

        return render_template("today.html", texpense = texpense, expense = expense, total =
        total ,

                t_food = t_food,t_entertainment = t_entertainment,

        t_business = t_business, t_rent = t_rent, t_EMI = t_EMI, t_other =

        t_other ) @app.route("/month" )def month():

        # cursor = mysql.connection.cursor()

        # cursor.execute('SELECT DATE(date), SUM(amount) FROM expenses WHERE userid=
        %s AND MONTH(DATE(date))= MONTH(now()) GROUP BY DATE(date)
        ORDER
        BY DATE(date)

        ',(str(session['id'])))# texpense = cursor.fetchall()

        # print(texpense) param1 = "SELECT DATE(date) as dt, SUM(amount) as tot FROM
        expenses WHERE userid = " + str(session['id']) + " AND MONTH(date) = MONTH(current
        timestamp) AND
        YEAR(date) = YEAR(current timestamp) GROUP BY DATE(date) ORDER BY
        DATE(date)"                      res1                      =
        ibm_db.exec_immediate(ibm_db_conn,         param1)

        dictionary1 = ibm_db.fetch_assoc(res1) texpense = []
```

```
while    dictionary1    !=    False:temp    =    []
temp.append(dictionary1["DT"])
temp.append(dictionary1["TOT"]
)texpense.append(temp)  print(temp)  dictionary1  =
ibm_db.fetch_assoc(res1)
```

```
# cursor = mysql.connection.cursor()
# cursor.execute('SELECT * FROM expenses WHERE userid = % s AND
MONTH(DATE(date))= MONTH(now()) AND date ORDER BY
`expenses`.`date`DESC',(str(session['id'])))
# expense = cursor.fetchall() param = "SELECT * FROM expenses WHERE userid = "
+ str(session['id']) + " AND MONTH(date) = MONTH(current timestamp) AND
YEAR(date) = YEAR(current timestamp)ORDER BY date DESC" res =
ibm_db.exec_immediate(ibm_db_conn, param) dictionary = ibm_db.fetch_assoc(res)
expense = [] while dictionary != False:temp = [] temp.append(dictionary["ID"])
temp.append(dictionary["USERID"])                temp.append(dictionary["DATE"])
temp.append(dictionary["EXPENSENAME"])    temp.append(dictionary["AMOUNT"])
temp.append(dictionary["PAYMODE"])        temp.append(dictionary["CATEGORY"])
expense.append(temp) print(temp) dictionary = ibm_db.fetch_assoc(res)
```

```
total=0 t_food=0
t_entertainment=
0 t_business=0
t_rent=0
t_EMI=0
t_other=0

for  x  in  expense:
   total  +=  x[4]  if
   x[6] == "food":
      t_food += x[4] elif x[6]
   ==        "entertainment":
   t_entertainment  +=  x[4]
```

```python
        elif  x[6]  ==  "business":

        t_business += x[4]

        elif x[6] ==

            "rent":t_rent

            += x[4]

        elif x[6] ==

            "EMI":t_EMI +=

            x[4]

elif x[6] ==

            "other":t_other +=

            x[4]

print(total) print(t_food)

        print(t_entertainment)

        print(t_business)

        print(t_rent)

        print(t_EMI)

        print(t_other) return

        render_template("tod

        a y.html", texpense =

        texpense, expense =

        expense, total =total ,

                t_food = t_food,t_entertainment = t_entertainment,

                t_business = t_business, t_rent = t_rent, t_EMI =

                t_EMI, t_other = t_other )


        @app.route("/year") def

        year():

            # cursor = mysql.connection.cursor()

            # cursor.execute('SELECT  MONTH(date), SUM(amount) FROM expenses WHERE
        userid= %s AND YEAR(DATE(date))= YEAR(now()) GROUP BY MONTH(date) ORDER
        BY
        MONTH(date)

            ',(str(session['id'])))# texpense

            = cursor.fetchall() # print(texpense)
```

PNT2022TMID03137

```python
    param1 = "SELECT MONTH(date) as mn, SUM(amount) as tot FROM expenses
WHERE userid = " + str(session['id']) + " AND YEAR(date) = YEAR(current
timestamp)GROUP BY MONTH(date) ORDER BY MONTH(date)" res1 =
ibm_db.exec_immediate(ibm_db_conn, param1) dictionary1 =
ibm_db.fetch_assoc(res1) texpense = []
while dictionary1 != False:temp =
        []
            temp.append(dictionary1["MN"])
            temp.append(dictionary1["TOT"]
            )texpense.append(temp) print(temp)
            dictionary1 =
            ibm_db.fetch_assoc(res1)
        # cursor = mysql.connection.cursor()
        # cursor.execute('SELECT * FROM expenses WHERE userid = % s AND
    YEAR(DATE(date))= YEAR(now()) AND date ORDER BY
    `expenses`.`date` DESC',(str(session['id'])))
        # expense = cursor.fetchall()
        param = "SELECT * FROM expenses WHERE userid = " + str(session['id']) + "
ANDYEAR(date) = YEAR(current timestamp) ORDER BY date DESC" res =
ibm_db.exec_immediate(ibm_db_conn,        param)        dictionary        =
ibm_db.fetch_assoc(res)  expense  =  []  while  dictionary  != False:temp  =  []
temp.append(dictionary["ID"])                    temp.append(dictionary["USERID"])
temp.append(dictionary["DATE"])    temp.append(dictionary["EXPENSENAME"])
temp.append(dictionary["AMOUNT"])        temp.append(dictionary["PAYMODE"])
temp.append(dictionary["CATEGORY"])        expense.append(temp)        print(temp)
dictionary = ibm_db.fetch_assoc(res)
        total=0     t_food=0
        t_entertainment=0
        t_business=0
        t_rent=0     t_EMI=0
        t_other=0  for  x  in
        expense:   total   +=
        x[4]   if   x[6]   ==
        "food":
```

```python
                t_food += x[4] elif x[6]

            == "entertainment":

            t_entertainment += x[4]

elif x[6] == "business":

                t_business += x[4]

            elif x[6] ==

                "rent":t_rent +=

                x[4]


            elif x[6] ==

                "EMI":t_EMI

                += x[4]
elif x[6] ==

                "other":t_other +=

                x[4]


            print(total)

            print(t_food)

            print(t_entertainment)

            print(t_business)

            print(t_rent)

            print(t_EMI)

            print(t_other) return

            render_template("tod

            a y.html", texpense =

            texpense, expense =

            expense, total =total ,

                    t_food = t_food,t_entertainment = t_entertainment,

                    t_business = t_business, t_rent = t_rent, t_EMI =

                    t_EMI, t_other = t_other )


        #log-out


    @app.route('/logout')
```

```python
def logout():
    session.pop('loggedin',        None)
session.pop('id',                  None)
session.pop('username',            None)
session.pop('email',    None)      return
render_template('home.html')    port   =
os.getenv('VCAP_APP_PORT',
'8080')if_name == " main ":
    app.secret_key      =       os.urandom(12)      app.run(debug=True,
    host='0.0.0.0', port=port)
```

deployment.yaml: apiVersion: apps/v1

kind: Deployment metadata: name:
sakthi-flask-node-deployment

spec:

  replicas: 1 selector:

   matchLabels:

    app: flasknode

  template:

   metadata: labels:

    app: flasknode

   spec: containers:

 - name: flasknode   image:

  icr.io/sakthi_expense_tracker2/flask-

  template2

    imagePullPolicy: Always
    ports:

 - containerPort: 5000 *flask-service.yaml:*

  apiVersion: v1kind: Service metadata:

  name: flask-app-service

spec:

 selector: app:

  flask-app

 ports:

PNT2022TMID03137

```yaml
 - name: http protocol:
    TCPport: 80
    targetPort:  5000
type: LoadBalancer
```

manifest.yml:

```yaml
applications:
 - name: Python Flask App IBCMR 2022-
   10-
   19random-route: true
   memory:        512M
   disk_quota: 1.5G
```

sendemail.py: import

```python
smtplib         import
sendgrid as sg import
os
from sendgrid.helpers.mail import Mail, Email, To, ContentSUBJECT
= "expense tracker"
s = smtplib.SMTP('smtp.gmail.com', 587) def
sendmail(TEXT,email):
   print("sorry we cant process your candidature")
   s = smtplib.SMTP('smtp.gmail.com',
   587)s.starttls()
   #                s.login("il.tproduct8080@gmail.com",            "oms@1Ram")
   s.login("tproduct8080@gmail.com",
   "lxixbmpnexbkiemh")message = 'Subject:
   {}\n\n{}'.format(SUBJECT, TEXT)
   #         s.sendmail("il.tproduct8080@gmail.com",         email,         message)
   s.sendmail("il.tproduct8080@gmail.com", email, message)
   s.quit()
def sendgridmail(user,TEXT):
   # from_email =
   Email("shridhartp24@gmail.com")from_email =
   Email("tproduct8080@gmail.com") to_email = To(user)
   subject = "Sending with SendGrid is
   Fun"content =
```

```
Content("text/plain",TEXT)

mail = Mail(from_email, to_email, subject, content) #

Get a JSON-ready representation of the Mail object

mail_json = mail.get()

# Send an HTTP POST request to /mail/send response =

sg.client.mail.send.post(request_body=mail_json)

print(response.status_code)

print(response.headers)
```

Database Schema

Tables : 1. Admin

:

        id INT NOT NULL GENERATED ALWAYS AS
   IDENTITY,username VARCHAR(32) NOT NULL,
   emailVARCHAR(32)   NOT   NULL,password
   VARCHAR(32) NOT NULL

2. Expense:
        id INT NOT NULL GENERATED ALWAYS AS
   IDENTITY,userid INT NOT NULL, date TIMESTAMP(12)
   NOT
   NULL,expensename VARCHAR(32) NOT NULL,
   amountVARCHAR(32) NOT NULL, paymode
   VARCHAR(32) NOT NULL,
category VARCHAR(32) NOT NULL

3. LIMIT

   id INT NOT NULL GENERATED ALWAYS AS
   IDENTITY,userid VARCHAR(32) NOT NULL,
   limit VARCHAR(32) NOT NULL

   8. TESTING:
   a.TestCases:

PNT2022TMID03137

Test case ID	Feature Type	Component	Test Scenario	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Comments	BUG ID	Executed By
LoginPage_TC_OO1	Functional	Home Page	Verify user is able to see the Login/Signup popup when user clicked on My account button	1. Go to website 2. Enter Valid username and password	Username: Kavi password: 123456	Login/Signup popup should display	Working as expected	Pass	-		Kavinaya
Loginpage_TC_002	Functional	Home Page	Verify that the error message is displayed when the user enters the wrong credentials	1. Go to website 2. Enter Invalid username and password	Username: XXXX Password: 12345	Error message should displayed	Working as expected	Pass	-		Afra
LoginPage_TC_OO2	UI	Home Page	Verify the UI elements in Login/Signup popup	1.Go to website 2.Enter valid credentials 3.Click Login	Username: Kavi password: 123456	Application should show below UI elements: a.email text box b.password text box c.Login button with orange colour d.New customer? Create account link e.Last password? Recovery password link	Working as expected	Pass	-		Abdul Waseem
LoginPage_TC_OO3	Functional	Home page	Verify user is able to log into application with Valid credentials	1.Go to website 2.Enter details and click login	Username: Kavi password: 123456	User should navigate to user account homepage	Working as expected	Pass	-		Jayasri
LoginPage_TC_OO4	Functional	Login page	Verify user is able to log into application with InValid credentials	1.Go to website 2.Enter details and click login	Username: Kavi password: 123456	Application should show 'Incorrect email or password ' validation message.	Working as expected	Pass	-		Afra
LoginPage_TC_OO4	Functional	Login page	Verify user is able to log into application with InValid credentials	1.Go to website 2.Enter details and click login	Username: Kavi password: 123456	Application should show 'Incorrect email or password ' validation message.	Working as expected	Pass	-		Kavinaya
LoginPage_TC_OO5	Functional	Login page	Verify user is able to log into application with InValid credentials	1.Go to website 2.Enter details and click login	Username: Kavi password: 123456	Application should show 'Incorrect email or password ' validation message.	Working as expected	Pass	-		Abdul Waseem
AddExpensePage_TC_OO6	Functional	Add Expense page	Verify whether user is able to add expense or not	1. Add date, expense name and other details 2.Check if the expense gets added	add rent = 6000	Application adds expenses	Working as expected	Pass	-		Jayasri

b.User Acceptance Testing

1. 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	10	4	2	8	15
Duplicate	1	0	3	0	4
External	2	3	0	1	6
Fixed	9	2	4	11	20
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won't Fix	0	5	0	1	8
Totals	22	14	11	22	51

2. Test Case Analysis

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

Section	Total Cases	Not Tested	Fail	Pass
Interface	7	0	0	7
Login	20	0	0	20
Logout	2	0	0	2
Limit	3	0	0	3
Signup	8	0	0	8
Final Report Output	4	0	0	4

CHAPTER 8 RESULTS

8. 1 Performance Metrics

i. Tracking income and expenses: Monitoring the income and tracking all expenditures (through bank accounts, mobile wallets, and credit & debit cards).

ii. Transaction Receipts: Capture and organize your payment receipts to keep track of your expenditure.

iii. Organizing Taxes: Import your documents to the expense tracking app, and it will streamline your income and expenses under the appropriate tax categories.

iv. Payments & Invoices: Accept and pay from credit cards, debit cards, net banking, mobile wallets, and bank transfers, and trackthe status of your invoices and bills in the mobile app itself. Also, the trackingapp sends remindersfor payments an d automatically matches the payments with invoices.

v. Reports: The expense tracking app generates and sends reports to give a detailed insight about profits, losses, budgets, income,balance sheets, etc.,

vi. Ecommerce integration: Integrateyour expense trackingapp wit h your eCommerce store and track your sales through payments received via multiple payment methods.

vii. Vendors and Contractors: Manage and track all the payments to the vendors and contractors added to the mobile app.

viii. Access control: Increase your team productivity by providing access control to particular users through custom permissions.

ix. Track Projects: Determine project profitability by tracking laborcosts, payroll, expenses, etc., of your ongoing project.

x. Inventory tracking: An expense tracking app can do it all. Rightfrom tracking products or the cost of goods, sending alertnotifications when the product is running out of stock or the product is not selling, to purchase orders.

xi. In-depth insights and analytics: Provides in-built tools to generate reports with easy-to- understand visuals and graphics to gain insights about the performance of yourbusiness.

xii. Recurrent Expenses: Rely on your budgeting app to track, streamline, and automate all the recurrent expenses and remindyou on a timely basis.

CHAPTER 9 ADVANTAGES & DISADVANTAGES

1. **Achieve your business goals** with a tailored mobile app that perfectly fits your business.

2. **Scale-up** at the pace your business is growing.

3. Deliver an **outstanding** customer experience through additional control over the app.

4. Control the **security** of your business and customer data

5. Open **direct marketing channels** with no extra costs with methodssuch aspush notifications.

6. **Boost the productivity** of all the processes within theorganization.

7. Increase **efficiency** and **customer satisfaction** with an app aligned to their needs.

8. **Seamlessly integrate** with existing infrastructure.

9. Ability to provide **valuable insights**.

10. Optimize sales processes to generate **more revenue** through enhanced data collection.

CHAPTER 10
CONCLUSION

From this project, we are able to manage and keep tracking the daily expenses as well as income. While making this project, we gained a lot of experience of working as a team. We discovered various predicted and unpredicted problems and we enjoyed a lot solving them as a team. We adopted things like video tutorials, text tutorials, internet and learning materials to make our project complete.

CHAPTER 11

FUTURE

The project assists well to record the income and expenses
in general. However, this project has some limitations:

1. The application is unable to maintain the backup of data once it is uninstalled.

2. This application does not provide higher decision capability.

To further enhance the capability of this application, we recommend the following eatures
to be incorporated into the system:
3. Multiple language interface.
4. Provide backup and recovery of data.
5. Provide better user interface for user.
6. Mobile apps advantage.

CHAPTER 12

APPENDIX

Source Code Github Link : https://github.com/IBM-EPBL/IBM-Project-24161-1659938860.git

Project Demo Link:
https://drive.google.com/file/d/18wUe13b_LBwrd2Dlr73nBSAqyIZqw6zK/view?usp=sharing