1. INTRODUCTION

1.1. Project Overview

The most demanded skills for data scientists Python, R, SQL, and the list goes on and on. There are many surveys and reports that show some good statistics on popular data skills. In this post, I am going to gather first-hand information by scraping data science jobs from indeed.ca, analyze top skills required by employers, and make job recommendations by matching skills from resume to posted jobs. It will be fun!Python code can be found on my GitHub.This post is part of a series of people analytics experiments I am putting together:Job skill match (Recruitment) Employee attrition prediction (Employee Management) Pay gap by gender, ethnicity, profession (Employee Compensation) FUTURE WORK Organizational network analysis (ONA) FUTURE WORK Web Scraping I like scraping data from Internet because it is free! But you should not abuse it just because it is free. There are basic rules to follow so we do not get our cyber friends and reject ourselves from visiting their websites. All can be summed in two words: BE NICE. Read their terms and conditions on the website first, and space out your requests so that their website does not get hit too hard. Here is a very good web scraping 101.I scraped data science jobs from indeed.ca, the largest global recruiting website. I gathered data scientist/engineer/analyst jobs posted in the last 30 days (09/19/2018 – 10/19/2018), in 6 major Canadian cities, i.e. Toronto, Montreal, Vancouver, Ottawa, Calgary, and Edmonton. I used Selenium Webdriver to automate web scraping and saved results in a local JSON file.In total 367 job postings were retrieved, and it took about 20 minutes.Job Description Keyword Extraction For each job, I tokenized its job description, cleaned up the list by removing words defined in the NLTK list of stopwords, and finally filtered on a list of popular data science related skill words.Bar chart below shows top 30 data skills required by most employers . More than 60% jobs requires SQL, 48% requires Python, and 32% requires R. No surprise. It is worth noting that Excel is actually quite a common requirement, which I would not normally considered a serious data skill. Agile is also among the top required skills. AWS knowledge is more demanded than Azure or GCP.

1.2. Purpose

An expense tracker is a desktop application that keeps track of all your expenses and stores all the information regarding them, including the person to whom you have paid the money (also called payee) and the reason why you paid the money.The objective of this project is to create a GUI based Expense Tracker. To build this, you will need an intermediate understanding of the Tkinter library, SQL language and its commands, and basic understanding of the message box module, ttk.Treeview widget and tkcalender library.

2. LITERATURE SURVEY

2.1. Existing problem

Money View App reads all of the transactional SMS messages and provides you with real-time visibility into your finances. This app unearths the hidden financial data that sits idly in SMS logs and makes excellent use of it.This personal finance manager app acts as a proactive budget planner, assisting you in staying on top of your budget, bills, and finances. The personal finance app was designed for simple, real-time budget and financial tracking, making it one of the best expense tracker apps in India.You can use the budget planner and spending tracker to keep track of your personal and business financial transactions, review financial data on a daily/weekly/monthly basis, and manage your assets.Monefy tracks the user's expenses and compares them to the monthly income and the budget planner. Monefy's money manager app keeps your monthly budget in top shape. As a result, it could also serve as the best expense tracker app.Wallet can automatically track your daily expenses by syncing your bank account, view weekly expense reports, plan your shopping expenses, and share specific features with your loved ones. You can manage your money with a wallet from anywhere and at any time.Walnut automates and secures the tracking of your monthly expenses. You can stay within your budget, pay your bills on time, and save more money each month by using the Walnut app. They also provide personal loans.

2.2. References

1. https://moneyview.in/insights/best-personal-fnance-management-apps-in-india
2. https://www.factmr.com/report/personal-fnance-mobile-app-marke t
3. https://www.moneytap.com/blog/best-money-management-apps/
4. https://relevant.software/blog/personal-fnance-app-like-mint/
5. https://www.onmanorama.com/lifestyle/news/2022/01/11/fnancial-literacy-trend-among-todays-youth-investment.html
6. https://www.livemint.com/money/personal-fnance/96-indian-parents-feel-their-children-lack-fnancial-know-how-survey-1166133611085 5.html
7. https://economictimes.indiatimes.com/small-biz/money/importance-of-fnancial-literacy-amongst-youngsters/articleshow/85655134.cms
8. https://www.news18.com/news/education-career/only-27-adults-16-7-of-indian-teenagers-fnancially-literate-4644893.html

2.3. Problem Statement Definition

Modern education does not focus on finance management. This is primarily due to lack of resources and the Indian value system on giving money to children. Failing to teach this valuable knowledge had left many Indians to recklessly spend their income and fall into vicious cycles of EMI and debt. Many of them are just a month's salary away from bankruptcy.This issue is tackled by providing a web application for where people can plan their monthly expenses into categories, set alerts and get visual insights from their spending patterns. Who does the problem affect Young adults and earning middle class citizens? What is the issue? Lack of financial literacy among people When does the issue occur Primarily when the person moves from college to job and starts earning their own money.Where is the issue occurring Especially among young engineers who are newly exposed to consumer centric market and services.

3. IDEATION & PROPOSED SOLUTION

3.1. Empathy Map Canvas

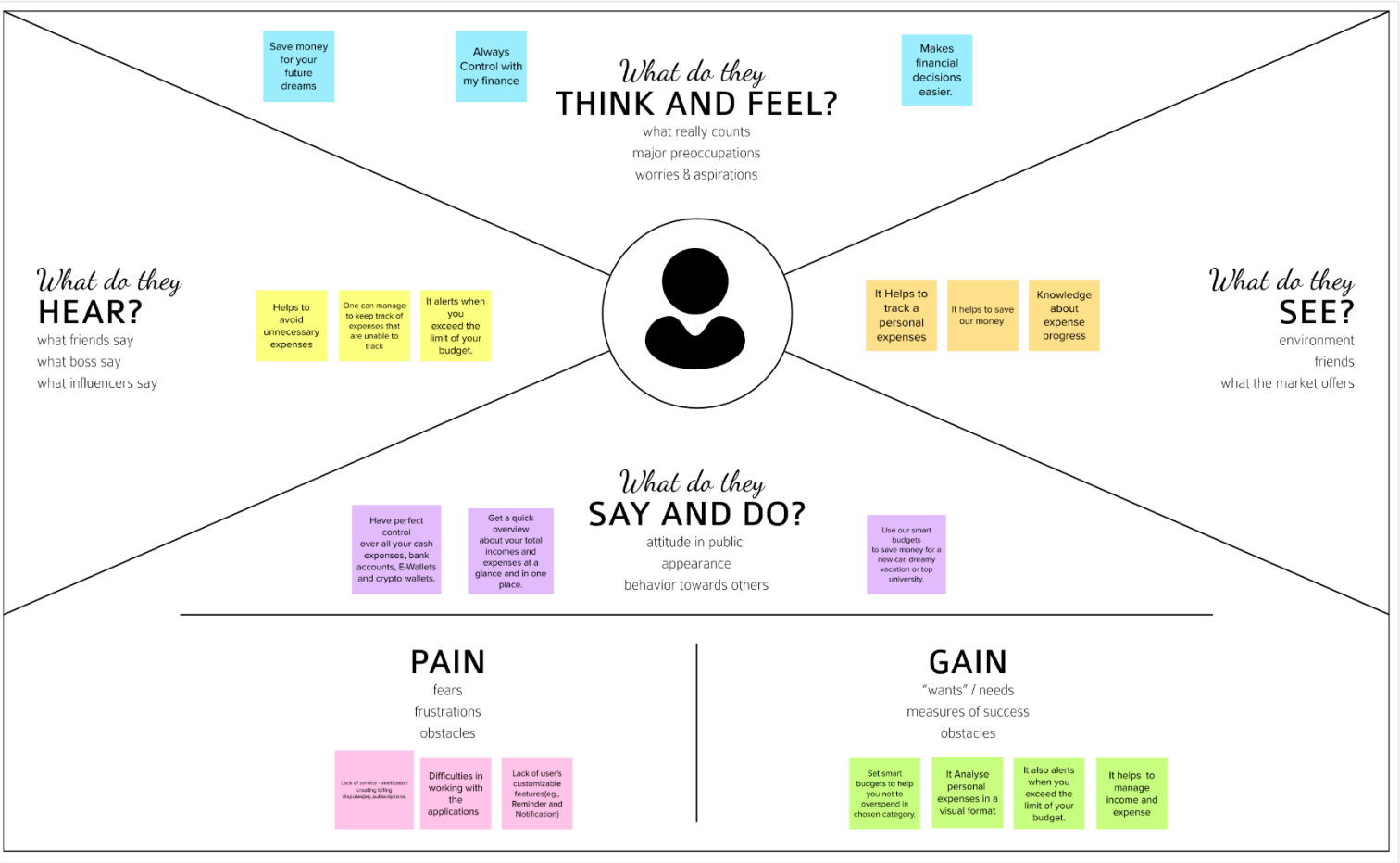
Edit this template
Right-click to unlock

Empathy Map Canvas

Gain insight and understanding on solving customer problems.

1

Build empathy and keep your focus on the user by putting yourself in their shoes.



Share your feedback

3.2. Ideation & Brainstorming

3.3. Proposed Solution

Problem Statement Building a personal finance tracking application that will imbibe good spending habits into students.(Problem to be solved)Idea / Solution description To build a web application that is deployed in IBM cloud and leverage mailing service like sendgrid to implement the same Novelty / Uniqueness The stats generated with visual graphs are more effective than log books. It also helps in using technology to gain better insights from Social Impact / Customer Satisfaction Better financial knowledge is gained. Gamified approach can be used to give self satisfaction.Reduced chances of bad debt in future Business Model (Revenue Model) Subscription can be incorporated to access premium tools within the app. Scalability of the Solution as deployment.As the application is containerized fr It can be easily scaled in a cloud service provider like IBM.

3.4. Problem Solution fit

Define CS, fit into CC

1. CUSTOMER SEGMENT(S) CS

Who is your customer?

Predominantly Engineers who are just starting to earn and manage their personal finance. Typically from middle and lower class family, who badly need financial discipline .

6. CUSTOMER CONSTRAINTS CC

What constraints prevent your customers from taking action or limit their choices of solutions?

The impulse buying and lacking to awareness to look into bigger picture

5. AVAILABLE SOLUTIONS AS

Which solutions are available to the customers when they face the problem

Totally shunning to spend even on necessities under the impression that the spending could result in bad financial position.

The existing solutions are otherwise over complicated and designed to extract data from user.

Manual physical logging in time consuming

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? There could be more than one; explore different sides.

- Logging expenses into categories
- Show historical stats
- Generate insightful charts
- Alert user to imbibe good discipline

9. PROBLEM ROOT CAUSE RC

What is the real reason that this problem exists?

Lack of proper education in financial literacy in school education. More children are not given pocket money to learn by spending/wasting less / saving.

7. BEHAVIOUR BE

What does your customer do to address the problem and get the job done?

Get frustrated and fall into debt traps by taking unpayable loans for unnecessary items leading to increase in mental stress

Focus on J&P, tap into BE, understand RC

Identify strong TR & EM

3. TRIGGERS TR

What triggers customers to act?

Frequent sales in e-commerce platforms and seamless shopping experience online.

4. EMOTIONS: BEFORE / AFTER EM

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

Dejected and paranoid about the future as they would need relatively more money to provide for a family and to handle unexpected financial needs.

10. YOUR SOLUTION SL

If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality.

If you are working on a new business proposition, then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behavior.

Graphical Application with simple UI and to the point clutter free objective. Avoids provision to pay through the app, to minimize the spending and ensure that only necessary spendings are made. The aim is to make the spending process harder throughout the application and keep it clean.

8.CHANNELS of BEHAVIOUR CH

8.1 ONLINE

What kind of actions do customers take online? Extract online channels from #7

1. Shop from e-commerce
2. Subscribe to OTT platforms
3. Order food frequently

8.2 OFFLINE

What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.

1. Shop in malls during sales
2. Keep the money somewhere around and forget about /lose it

Identify strong TR & EM

4. REQUIREMENT ANALYSIS

4.1. Functional requirement

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Email/SignUp Registration through Gmail
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Add expenses	Enter the everyday expenses Split it into categories(example : food, petrol,movies)
FR-4	Reminder mail	Sending reminder mail on target (for ex : if user wants a reminder when his/her balance reaches some amount(5000)) Sending reminder mail to the user if he/she has not filled that day's expenses.
FR-5	Creating Graphs	Graphs showing everyday and weekly expenses. Categorical graphs on expenditure.
FR-6	Add salary	Users must enter the salary at the start of the month.
FR-7	Export CSV	User can export the raw data of their expenditure as CSV

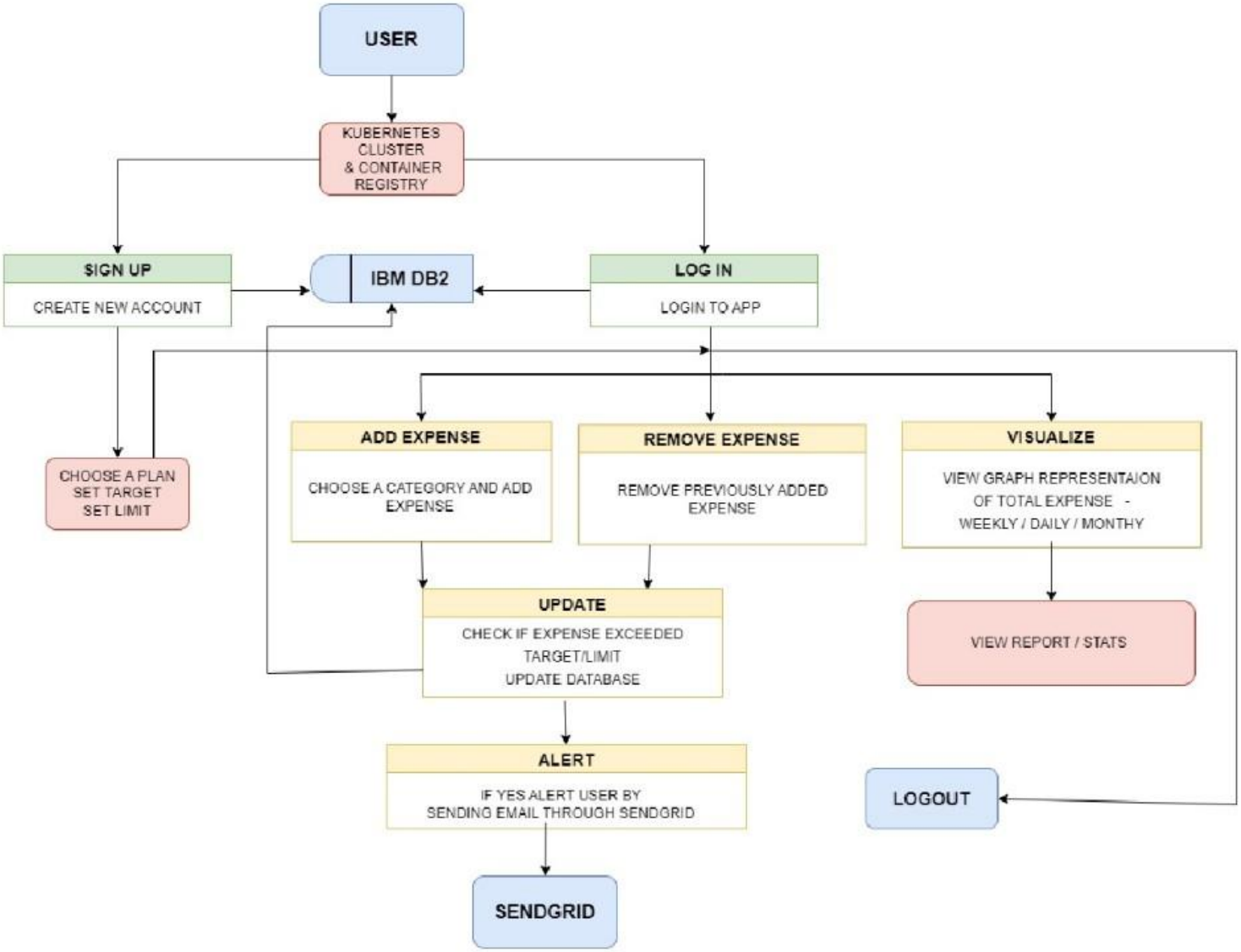
4.2. Non-Functional requirements

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

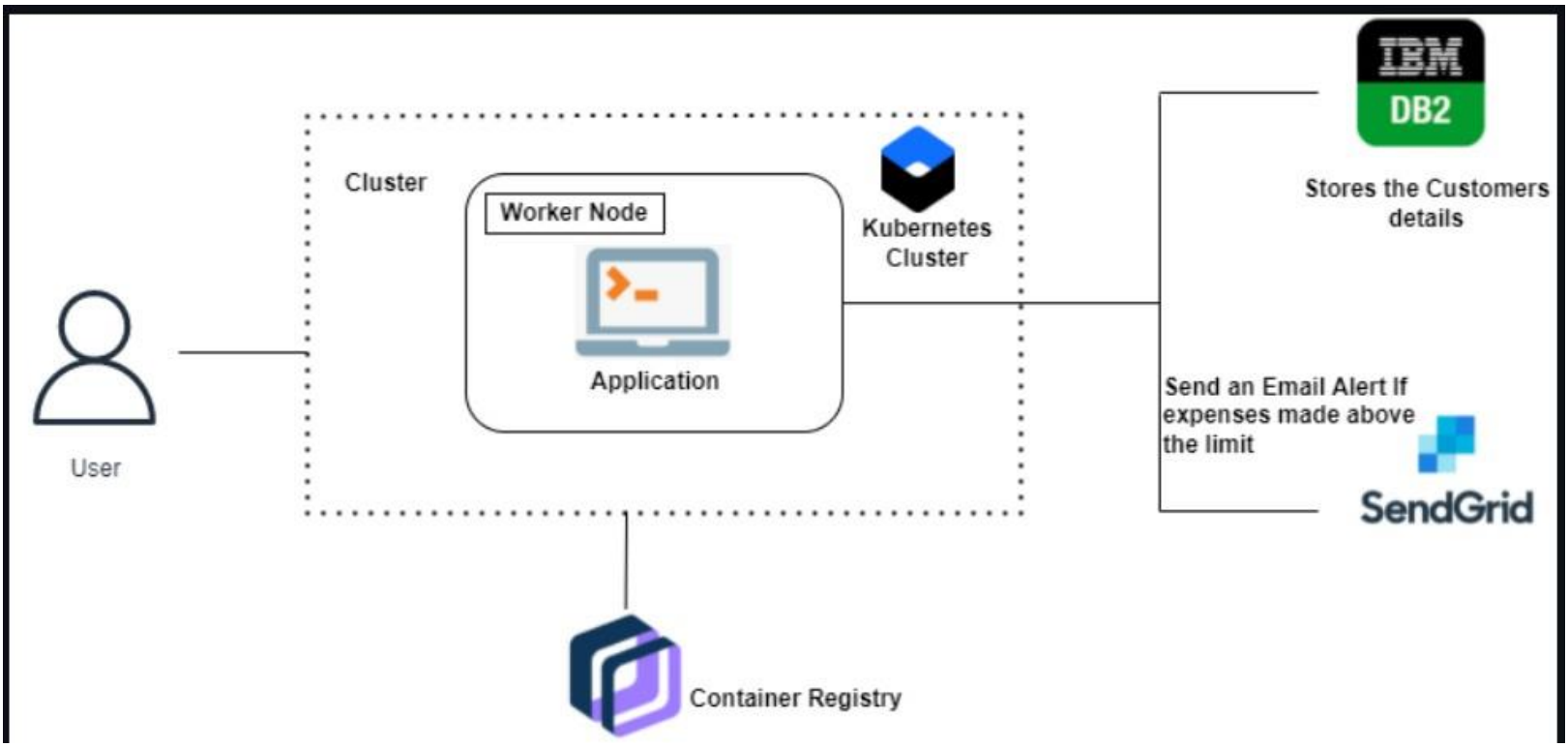
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	A simple web application which is accessible across devices
NFR-2	**Security**	The OAuth Google sign in and email login are secure with hashed and salted secure storage of credentials.
NFR-3	**Reliability**	Containerized service ensures that new instance can kick up when there is a failure
NFR-4	**Performance**	The load is managed through the load balancer used with docker. Thus ensuring good performance
NFR-5	**Availability**	With load balancing and multiple container instances, the service is always available.
NFR-6	**Scalability**	Docker and Kubernetes are designed to accommodate scaling based on need

5. PROJECT DESIGN

5.1. Data Flow Diagrams



5.2. Solution & Technical Architecture+

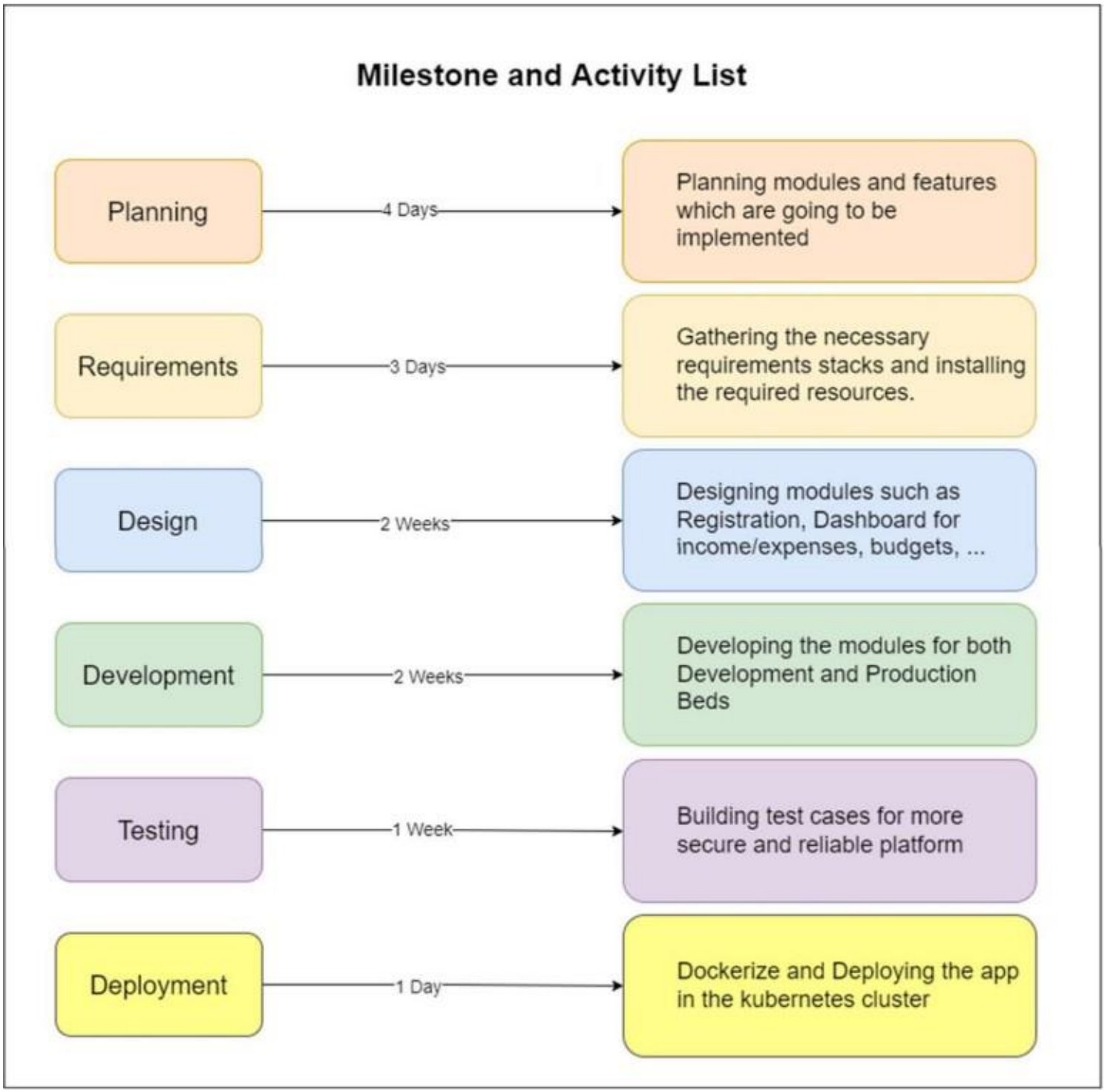


5.3. User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.
	Login	USN-2	As a user, I can log into the application by entering email & password
	Add	USN -3	As a user , I can add in new expenses.
	Remove	USN–4	As a user , I can remove previously added expenses.
	View	USN-5	As a user , I can view my expenses in the form of graphs and get insights.
	Get alert message	USN-6	As a user , I will get alert messages if I exceed my target amount.
Administrator	Add / remove user	USN–7	As admin , I can add or remove user details on db2 manually.
		USN-8	As admin , I can add or remove user details on sendgrid.

6. PROJECT PLANNING & SCHEDULING

6.1. Sprint Planning & Estimation

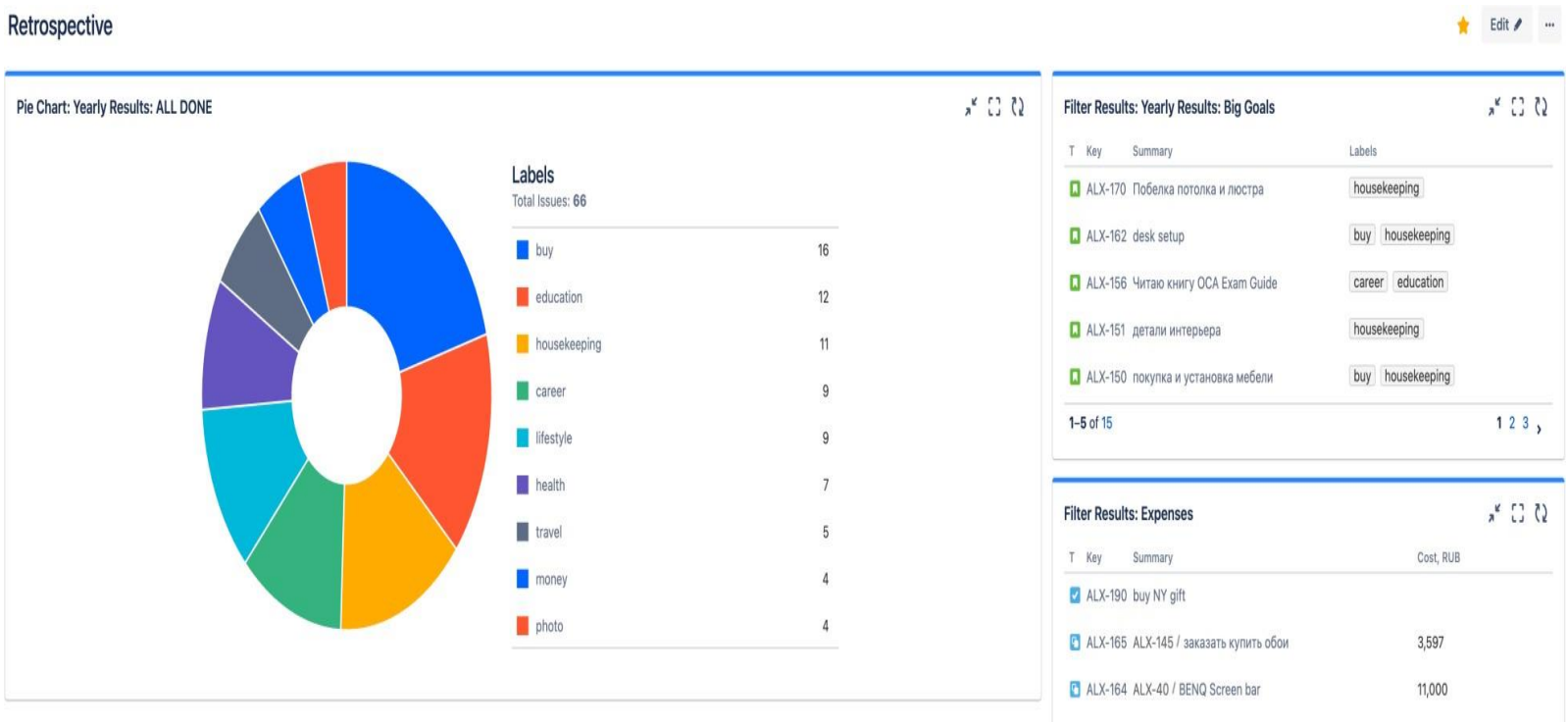


6.2. Sprint Delivery Schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-2		USN-6	As a user, I can log into the application by entering mobile no & password	3	High	Aswin Kumarappa
Sprint-3	Dashboard	USN-7	As a user, I can enter into the dashboard to add my income and expenditures	4	High	Rohith
Sprint-3	Alerts and Messages	USN-8	As a user, I can set limit to my expense and receive Alerts and messages via email/mobile number when it exceeds	4	High	Parthasarathy
Sprint-4	Report	USN-9	As a user I can view the graphical form of my expenses	3	High	Parthasarathy
Sprint-4	Call Service	USN-10	As a user I need a customer care support for clarifying the doubts and issues regarding the application any part of time	3	High	RamVishal

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	8	6 Days	24 Oct 2022	29 Oct 2022	8	29 Oct 2022
Sprint-2	5	6 Days	31 Oct 2022	05 Nov 2022	5	05 Nov 2022
Sprint-3	8	6 Days	07 Nov 2022	12 Nov 2022	8	12 Nov 2022
Sprint-4	6	6 Days	14 Nov 2022	19 Nov 2022	6	19 Nov 2022

6.3 Reports from JIRA



7. CODING & SOLUTIONING

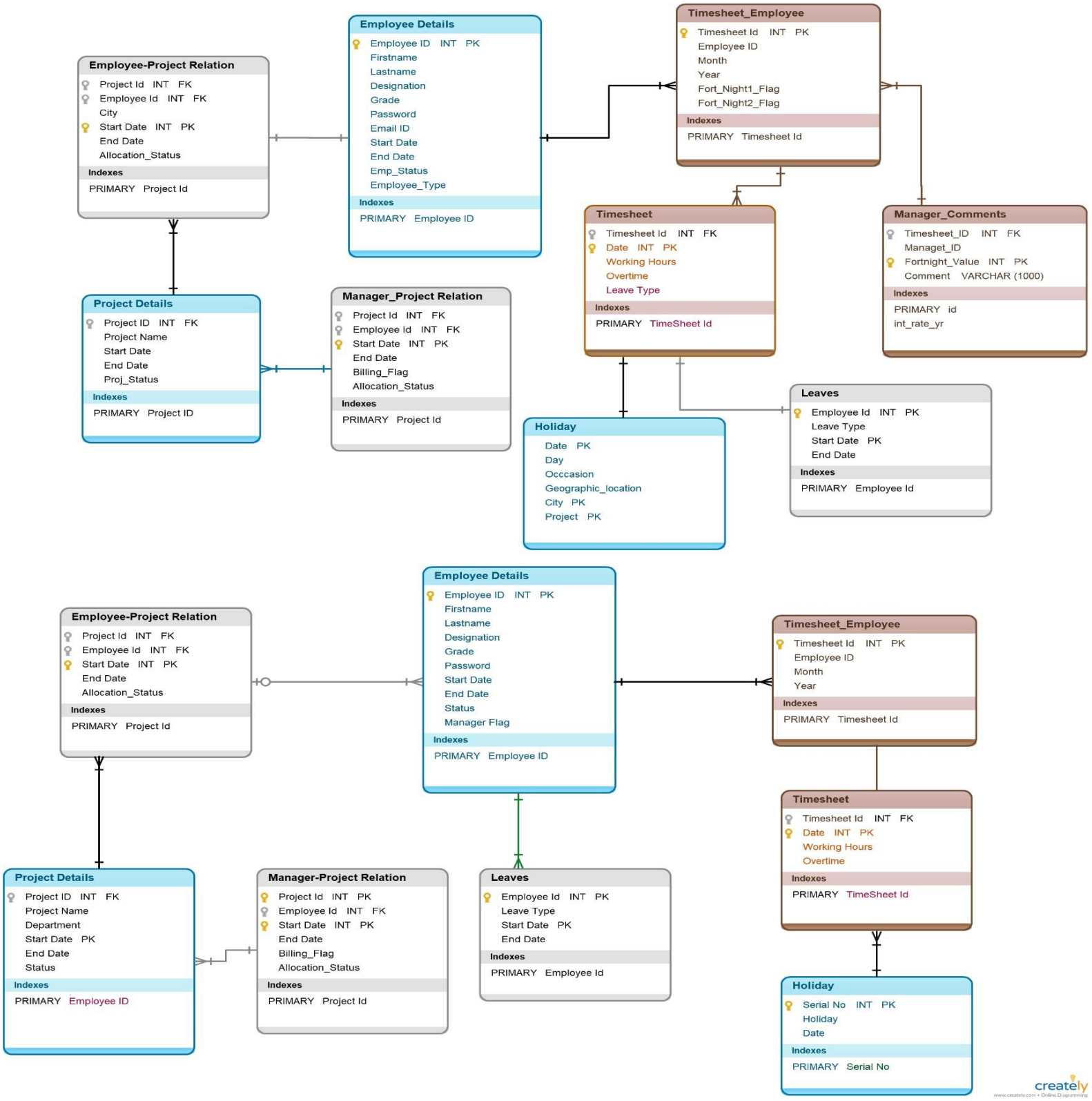
7.1. Feature 1

Handle Documents It’s time to stop using paper and excel spreadsheets for keeping records of your cash payments and online transactions! Papers are tough to handle and more dangerous for the environment.On the other hand, excel sheets may offer an online solution but don’t do much help in money handling. So, it’s better to develop money management software that collects insights from the data and helps make business decisions.Tracks Receipts You always can’t find the cash and digital payments made by you and this is a big issue with tracking expenses.So, if you want to keep a track of your monetary investments, you should go using a business expense tracker app. This helps store all receipts by only clicking their images in your expenses handling app.Prevents Data Losses and Frauds Manual handling of personal expenses and finances can’t check every transaction detail accurately.For this reason, fraud cases happen many times. Using an expense tracking and budgeting app, the workflow of money and finance handling becomes automated. This not just prevents fraudulence but also makes the procedure more accurate and transparent.

7.2. Feature 2

Mitigates Human Errors We cannot afford mistakes when it comes to handling budgets and finances. However, humans may make some errors because of misunderstanding, carelessness, or negligence.With the help of an expense handling app, you can lower as well as prevent every mistake caused because of carelessness.Offers Precise Analytics Excel spreadsheets might track and store data and create helpful charts or graphs from it but still have no advanced functionality. On the other hand, human engagement brings the possibility of mistakes.So, it’s best to build a business expense tracker app that carries out prediction analysis and helps you make efficient business decisions.

7.3. Database Schema



8. TESTING

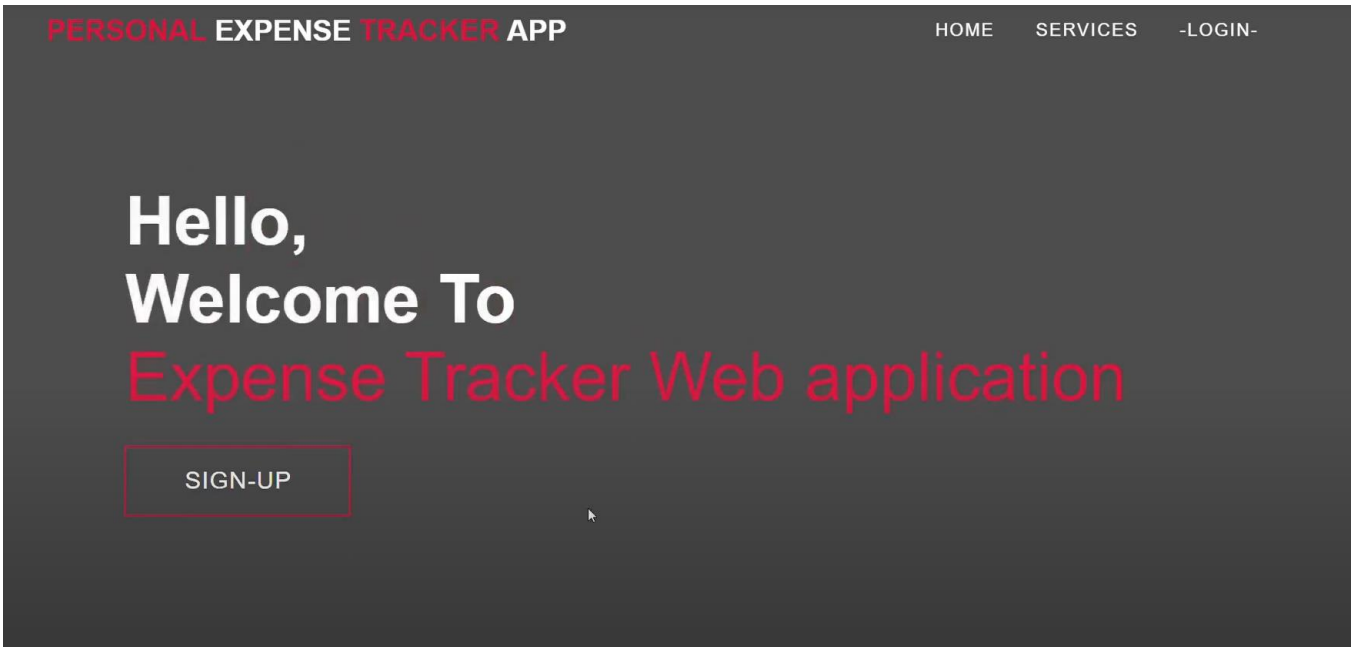
8.1. Test Cases

With a concerted effort, I conducted research on general well-being to have a rudimentary grasp on health management, as well as the existing job/skill recommender apps in order to get an understanding of what is already existing in the market, the characteristics, specialties, and usability.There are a considerable number of job/skill recommender apps tracking apps existing in the market. They aim to track daily spends intake by logging info given to achieve users' preset goals. To log spend, users can input the expense in the app, or scan the barcode of a package. Most apps allow users to connect with associated activities apps to track spend progress. With a premium upgrade, users can get access to tailor-made saving according to health goals or specified way to spend.In order to build a realistic initial target group, I wanted to conduct some usability tests with 5 users that regularly engage in buying activity and spending tracking, including both first-time and regular users of money planning . I asked these individuals to perform tasks related to general usage

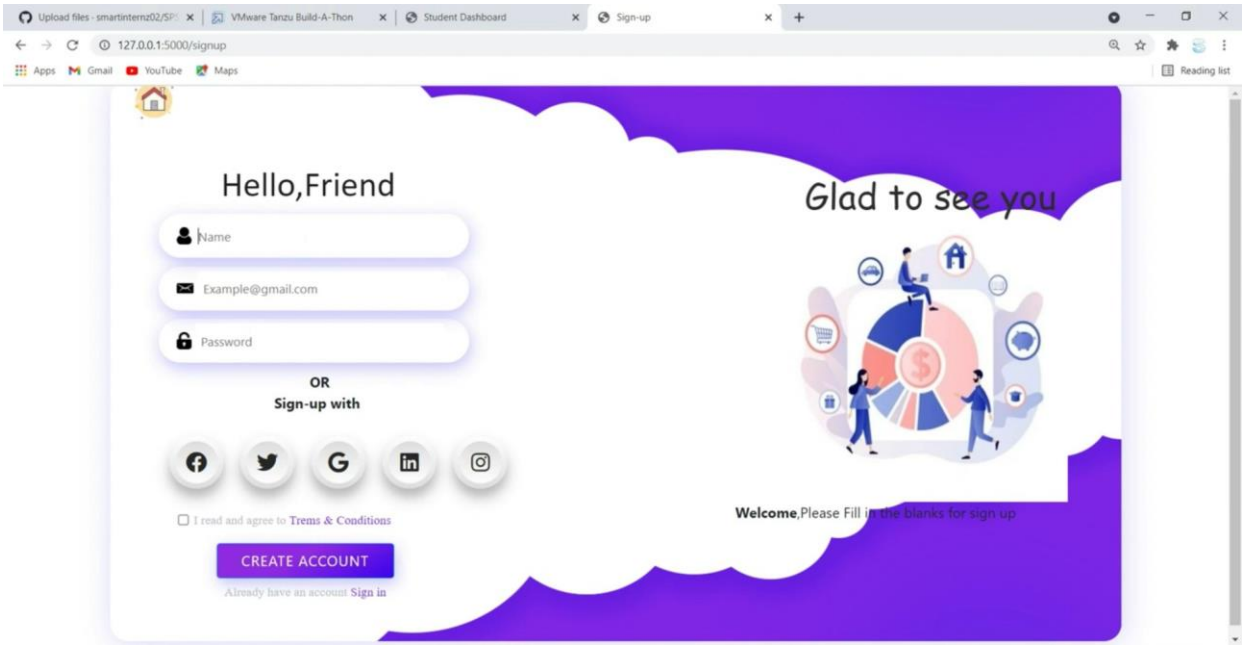
8.2. User Acceptance Testing

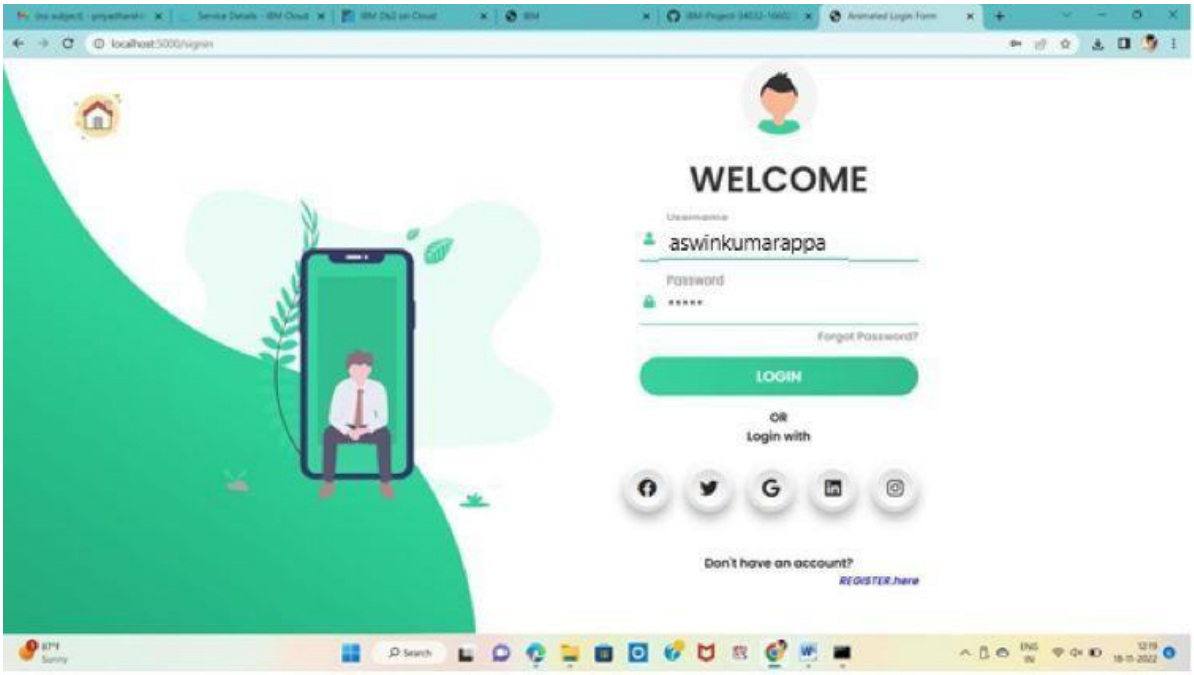
Must-have features of aJob/Skill recommender app I wanted to address the user pain points by including (and improving) the core features of the application.Personal profiles After downloading the app, a user needs to register and create an account. At this stage, users should fill in personal information like name, gender, age, height, weight, spend preferences, spend logging and dashboard Allowing users to analyze their spending habits. They should be able to log expenses and money intake and see their progress on a dashboard that can track overall spends.Push notifications Push notifications are an effective tool for increasing user engagement and retention. To motivate users to keep moving toward their goals, it's pertinent to deliver information on their progress toward the current goal and remind them to log what they spend on.money counter Enabling the application to calculate spent amount of users have gone and done based on the data they've logged.Barcode scanner Let users count money and see accurate spend information via a built-in barcode scanner.

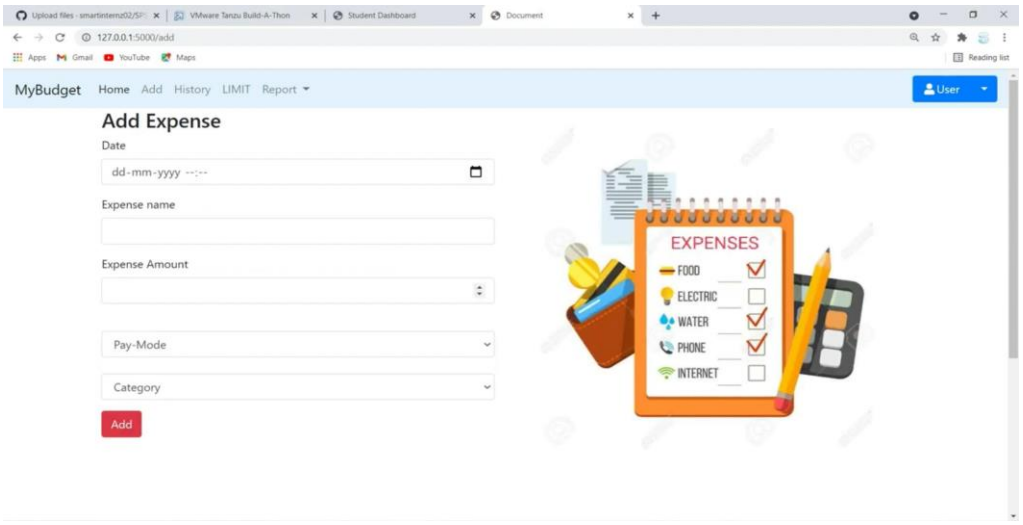
9. RESULTS

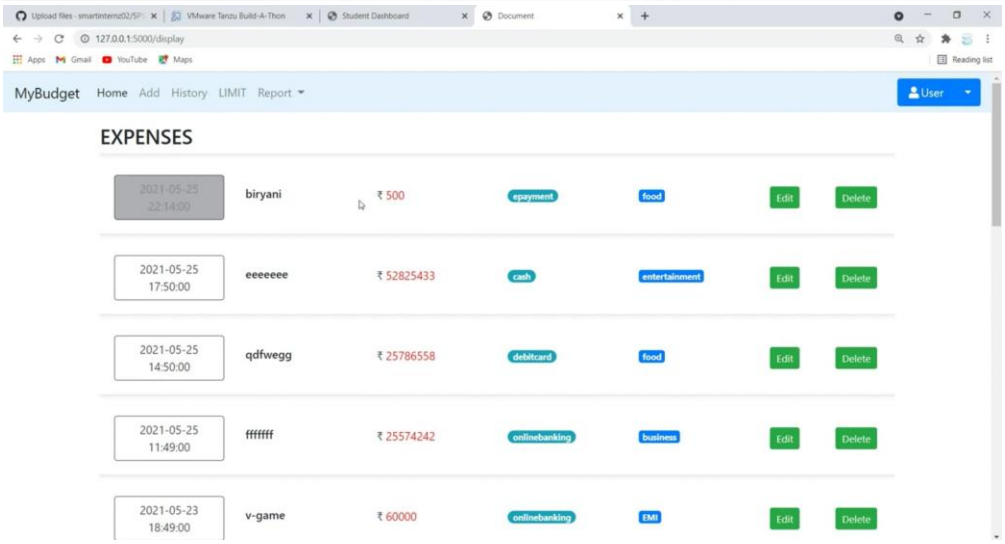


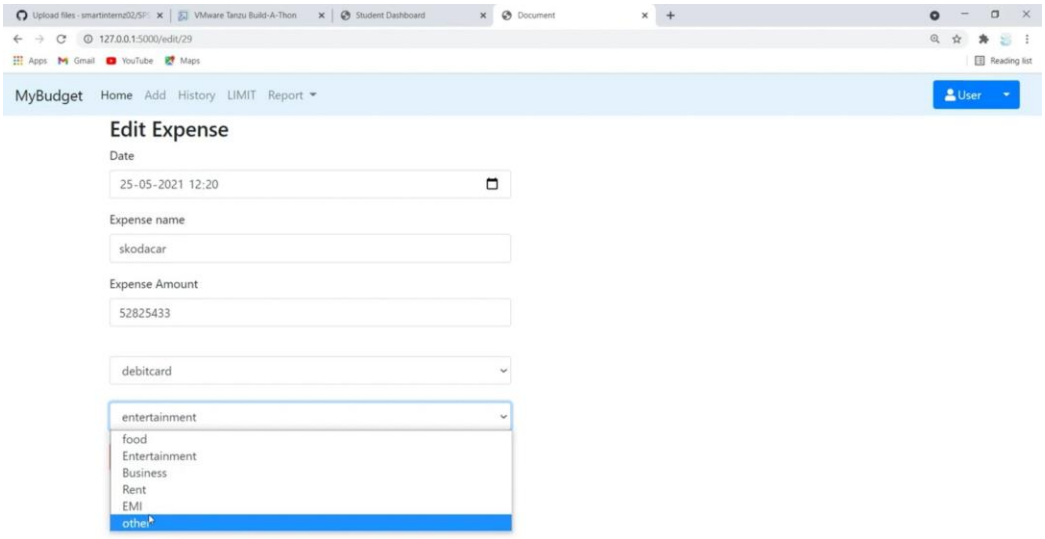
Performance Metrics

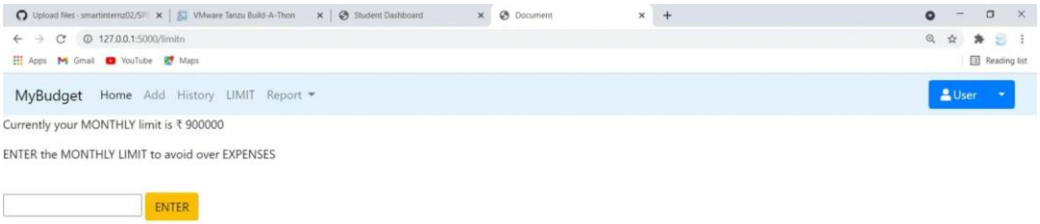


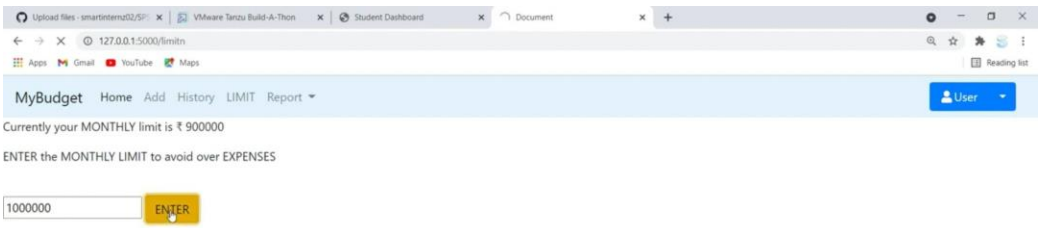

WELCOME
aswinkumarappa
Password
*****
Forgot Password?
LOGIN
OR
Login with
Don't have an account?
REGISTER here

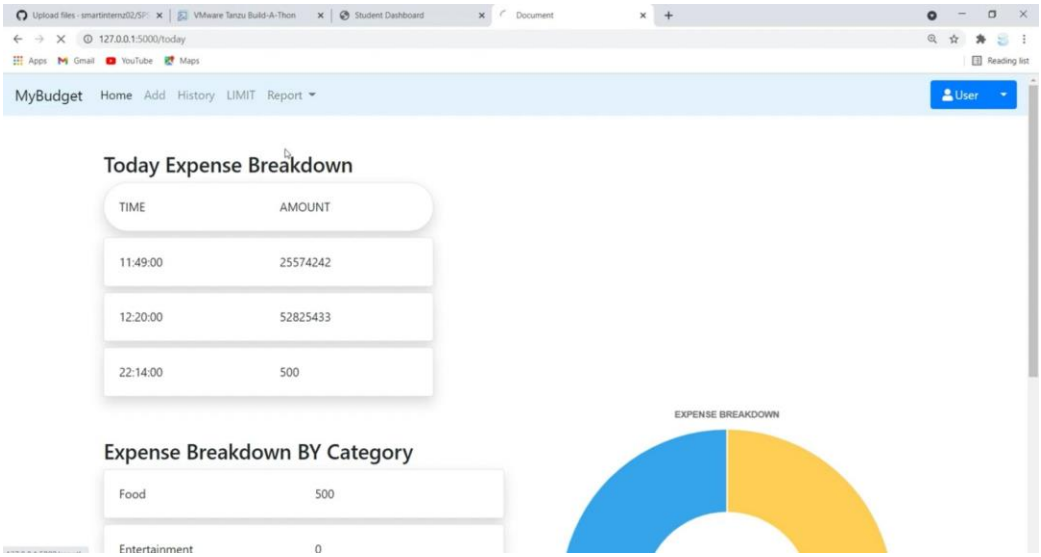

MyBudget
Home
Add
History
LIMIT
Report
User
Add Expense
Date
dd-mm-yyyy
Expense name
Expense Amount
Pay-Mode
Category
Add
EXPENSES
FOOD
ELECTRIC
WATER
PHONE
INTERNET

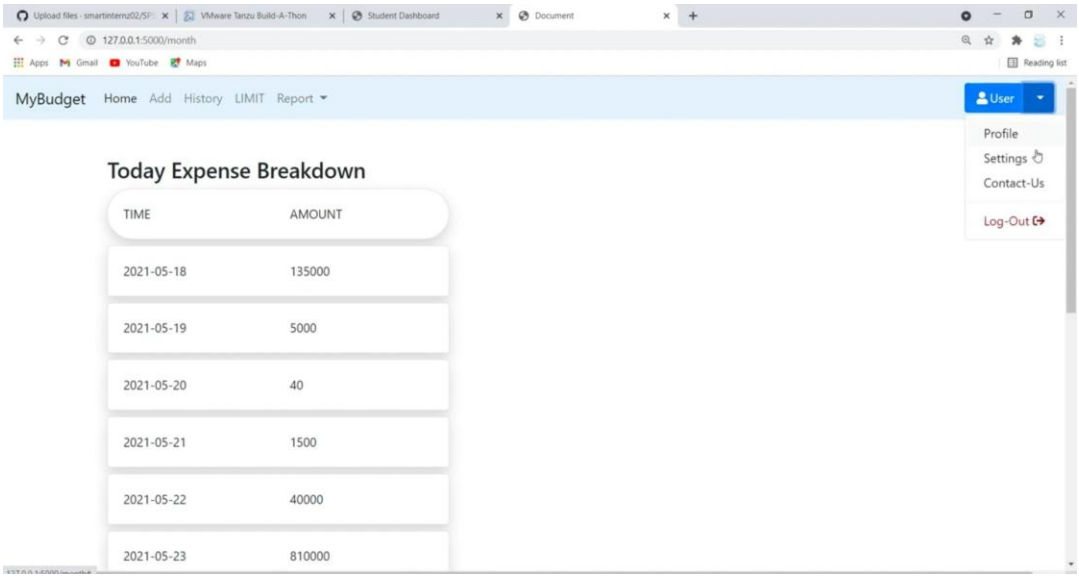

MyBudget
Home
Add
History
LIMIT
Report
User
EXPENSES
2021-05-25 22:14:00
biryani
₹ 500
epayment
food
Edit
Delete
2021-05-25 17:50:00
eeeeeee
₹ 52825433
cash
entertainment
Edit
Delete
2021-05-25 14:50:00
qdfwegg
₹ 25786558
debitcard
food
Edit
Delete
2021-05-25 11:49:00
fffffff
₹ 25574242
onlinebanking
business
Edit
Delete
2021-05-23 18:49:00
v-game
₹ 60000
onlinebanking
EMI
Edit
Delete


127.0.0.1:5000/edit/29
MyBudget
Home
Add
History
LIMIT
Report
User
Edit Expense
Date
25-05-2021 12:20
Expense name
skodacar
Expense Amount
52825433
debitcard
entertainment
food
Entertainment
Business
Rent
EMI
other


127.0.0.1:5000/limitn
MyBudget
Home
Add
History
LIMIT
Report
User
Currently your MONTHLY limit is ₹ 900000
ENTER the MONTHLY LIMIT to avoid over EXPENSES
ENTER


127.0.0.1:5000/limitn
MyBudget
Home
Add
History
LIMIT
Report
User
Currently your MONTHLY limit is ₹ 900000
ENTER the MONTHLY LIMIT to avoid over EXPENSES
1000000
ENTER





10. ADVANTAGES & DISADVANTAGES

10.1 Advantages:-

I have a cheaper cell phone plan, using a smaller provider than the big monopoly providers.I don't watch tv, so no cable, though my husband has a Netflix account and I'll watch comedy specials or sci-fi series on occasionI don't subscribe to any music streaming or video games.Come to think of it, I've never been that much into entertainment – I don't buy tickets to concerts, sports games, or movies (I am in the minority for sure – a lot of people around me love watching movies but I forget movies so fast so I hardly go to the theater). What do I do for fun? I take

walks with my family, work in the garden, read, surf online, nap, and I have a lot of occupations to keep me busy.I don't buy books, I borrow them at the library. I always have a lot of books on hold or on renewal for my family. I listen to a ton of audiobooks when I drive to and from work everyday, they are such a source of delight for me.I don't have healthcare premiums – I live in Canada.I don't eat out too much – we do batch cooking, I always bring my own lunch, snacks, and coffee in a thermos to work. I am adamant about perfectly planned meals that incorporate fiber, protein, fats, carbs, and high water content fruit. Plus I am very picky about what I buy at the grocery store. We do not eat processed junk food or soda, I mostly buy high-quality meat, fruit, and dairy. Rice is very economical. I also grind my own coffee beans and bring my coffee to work, I NEVER buy Starbucks and I never eat at the cafeteria. Why should I pay more for inferior food and drink prepared by people who don't have health as a priority I have a SodaStream, which is one of life's joys. I love fizzy sparkling water, and now I never have to buy club soda again. I can use tap water and my SodaStream carbonates it for me! I even drink more water now because of it, and I bring it in a water bottle when I'm out and about.I don't shop for clothes – at age 41, I have enough clothes already and still fit and wear the same size clothes as when I was a teenager. Since I always use a drying rack instead of the dryer, my clothes never wear out either. Over the years I've donated the ones that I don't wear, and kept the ones that I do. Plus, the hospital provides sterile scrubs for work which is free! I am happy with my wardrobe and usually wear cheap Uniqlo leggings with a dress that is 20 years old.

10.2 Disadvantages:-

Your information is less secure, and probably being used and sold. If the service is free, then the product is you. Mint.com, like other financial apps, is a free service. They have to pay their bills somehow, so regardless of what their privacy policy may or may not say, just assume that your spending history and trends are going to be recorded and analyzed, by someone, somewhere. Now, you shouldn't have

to worry about credit card fraud or identity theft, these companies are large enough and secure enough that you'll never have to worry about something like that. Just recognize that your information, most likely anonymous, will be used and potentially even sold. Personally, I have no problem with that, but if you do, then make sure you avoid these types of services.

Automating everything to do with your finances can make you financially lazy. If your bills are paid automatically and your finances are track automatically, then what is there left for you to do? Not a lot, to be honest. So you might stop caring about what you're spending and where your money is going. Eventually you may look at your Mint data and realize that you've blown your budget over the last two months, but by then it is too late. So if you do choose to use this program, ensure that you are also being diligent in checking in on your finances. Set up a weekly or biweekly check for yourself to go through your finances and hit on all the important points.

11. CONCLUSION

In this paper, we proposed a framework for job recommendation task. This framework facilitates the understand-ing of job recommendation process as well as it allows the use of a variety of text processing and recommendation methods according to the preferences of the job recommender system designer. Moreover, we also contribute mak-ing publicly available a new dataset containing job seekers pro les and job vacancies.Future directions of our work will focus on performing a more exhaustive evaluation considering a greater amount of methods and data as well as a comprehensive evaluation of the impact of each professional skill of a job seeker on the received job recommendation.

12. FUTURE SCOPE

Changing face of expense management software Year-on-year, modern expense management software underwent a continuous evolution from traditional back-office

function to strategic internal set of processes. But would it be sufficient to meet the needs of next-gen companies? Have you ever thought about what the next-generation software should look like? As the requirements of companies evolve continuously, the software should undergo a series of changes to meet the growing needs of next generation companies.The next-generation travel and expense (T & E) management apps should not only just accelerate the expense management process but also should come with mobile and cloud integration capabilities that add tremendous value to the business bottom line. Future T & E management software should be able to provide greater visibility into spending and standardize critical procedures.Next-gen expense management A recent T & E study unveiled that visibility and intelligence are the two key aspects that companies look forward to understanding spending associated with business travel. Analytics is also on the priority list of the best-in-class organizations. The motto is not just to enhance the existing process but also to leverage analytical capabilities and visibility that can help companies drive efficiency, forecast and plan better for corporate finances.Apparently, as per research, integration, analytics and mobile apps are the three key factors that can help companies succeed at a faster pace. When incorporated, these factors add edge and value to the businesses.Integration Integration between corporate cards and expense management software increases transparency and makes the process effortless throughout the expense report cycle.AnalyticsIncreased intelligence provides you with an unheralded level of visibility into travel spending and enhances overall T & E intelligence. Companies can measure the true performance of any business trip by evaluating the ROI. Efficiency complimented by intelligence proves to be a great way to take the business to new heights.Need for mobile applicationsMobile apps provide employees with the opportunity to manage expenses on the go. It gives both the companies and employees the flexibility that they need in managing the expense related activities. In fact, it increases accuracy as the power of technology is put into the hands of both employees and employers.On a final note, the next generation software should be something that gives users an unprecedented experience in expense management and allows organizations to emphasize on what's really important to make their businesses better.

13. APPENDIX

13.1. Source Code

```
package com.github.ematiyuk.expensetracer.activities;

import android.os.Bundle;
import android.support.annotation.LayoutRes;
import android.support.annotation.Nullable;
import android.support.v4.app.Fragment;
import android.support.v4.app.FragmentManager;
import android.support.v7.app.AppCompatActivity;
import android.support.v7.widget.Toolbar;

import com.github.ematiyuk.expensetracer.R;

public abstract class BaseFragmentActivity extends AppCompatActivity {
    protected Toolbar mToolbar;

    @LayoutRes
    protected int getLayoutResId() {
        return R.layout.activity_base;
    }

    @Override
    protected void onCreate(@Nullable Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(getLayoutResId());

        // Set a Toolbar to replace the ActionBar
        mToolbar = (Toolbar) findViewById(R.id.toolbar);
        setSupportActionBar(mToolbar);
    }

    protected void insertFragment(Fragment fragment) {
        // Insert the fragment by replacing any existing fragment
        FragmentManager fragmentManager = getSupportFragmentManager();
        fragmentManager.beginTransaction()
                .replace(R.id.content_frame, fragment)
                .commit();
    }
}

package com.github.ematiyuk.expensetracer.activities;

import android.os.Bundle;
```

```
import android.support.annotation.Nullable;
import android.support.v7.app.ActionBar;

import com.github.ematiyuk.expensetracer.fragments.CategoryEditFragment;

public class CategoryEditActivity extends BaseFragmentActivity {

    /* Important: use onCreate(Bundle savedInstanceState)
     * instead of onCreate(Bundle savedInstanceState, PersistableBundle
persistentState) */
    @Override
    protected void onCreate(@Nullable Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);

        insertFragment(new CategoryEditFragment());
        setupActionBar();
    }

    private void setupActionBar() {
        ActionBar actionBar = getSupportActionBar();
        if (actionBar != null) {
            // Show the Up button in the action bar (toolbar).
            actionBar.setDisplayHomeAsUpEnabled(true);
        }
    }
}

package com.github.ematiyuk.expensetracer.activities;

import android.os.Bundle;
import android.support.annotation.Nullable;
import android.support.v7.app.ActionBar;

import  com.github.ematiyuk.expensetracer.fragments.ExpenseEditFragment;

public class ExpenseEditActivity extends BaseFragmentActivity {

    /* Important: use onCreate(Bundle savedInstanceState)
     * instead of onCreate(Bundle savedInstanceState, PersistableBundle
persistentState) */
    @Override
    protected void onCreate(@Nullable Bundle savedInstanceState) {
```

```
        super.onCreate(savedInstanceState);

        insertFragment(new ExpenseEditFragment());
        setupActionBar();
    }

    private void setupActionBar() {
        ActionBar actionBar = getSupportActionBar();
        if (actionBar != null) {
            // Show the Up button in the action bar (toolbar).
            actionBar.setDisplayHomeAsUpEnabled(true);
        }
    }
}

package com.github.ematiyuk.expensetracer.activities;

import android.content.Intent;
import android.content.res.Configuration;
import android.os.Bundle;
import android.support.annotation.IdRes;
import android.support.annotation.LayoutRes;
import android.support.annotation.Nullable;
import android.support.design.widget.NavigationView;
import android.support.v4.app.Fragment;
import android.support.v4.view.GravityCompat;
import android.support.v4.widget.DrawerLayout;
import android.support.v7.app.ActionBarDrawerToggle;
import android.view.MenuItem;

import com.github.ematiyuk.expensetracer.fragments.CategoryFragment;
import com.github.ematiyuk.expensetracer.R;
import com.github.ematiyuk.expensetracer.fragments.ReportFragment;
import com.github.ematiyuk.expensetracer.fragments.TodayFragment;

public class MainActivity extends BaseFragmentActivity {
    private DrawerLayout mDrawerLayout;
    private NavigationView mNavDrawer;
    private ActionBarDrawerToggle mDrawerToggle;

    @Override
    @LayoutRes
```

```
protected int getLayoutResId() {
    return R.layout.activity_main;
}

@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);

    mDrawerLayout = (DrawerLayout) findViewById(R.id.drawer_layout);
    mNavDrawer = (NavigationView) findViewById(R.id.nav_drawer);
    mDrawerToggle = setupDrawerToggle();

    // Tie DrawerLayout events to the ActionBarToggle
    mDrawerLayout.addDrawerListener(mDrawerToggle);

    // Setup drawer view
    setupDrawerContent(mNavDrawer);

    // Select TodayFragment on app start by default
    loadTodayFragment();
}

@Override
protected void onPause() {
    super.onPause();
    closeNavigationDrawer();
}

@Override
public boolean onOptionsItemSelected(MenuItem item) {
    // Pass the event to ActionBarDrawerToggle, if it returns
    // true, then it has handled the app icon touch event
    if (mDrawerToggle.onOptionsItemSelected(item)) {
        return true;
    }

    return super.onOptionsItemSelected(item);
}

@Override
protected void onPostCreate(@Nullable Bundle savedInstanceState) {
    super.onPostCreate(savedInstanceState);
```

```
    // Sync the toggle state after onRestoreInstanceState has occurred.
    mDrawerToggle.syncState();
}

@Override
public void onConfigurationChanged(Configuration newConfig) {
    super.onConfigurationChanged(newConfig);
    // Pass any configuration change to the drawer toggle
    mDrawerToggle.onConfigurationChanged(newConfig);
}

@Override
public void onBackPressed() {
    if (!closeNavigationDrawer()) {
        Fragment currentFragment = getSupportFragmentManager()
                .findFragmentById(R.id.content_frame);
        if (!(currentFragment instanceof TodayFragment)) {
            loadTodayFragment();
        } else {
            // If current fragment is TodayFragment then exit
            super.onBackPressed();
        }
    }
}

private ActionBarDrawerToggle setupDrawerToggle() {
    return new ActionBarDrawerToggle(this, mDrawerLayout, mToolbar,
            R.string.drawer_open, R.string.drawer_close);
}

private void setupDrawerContent(NavigationView navigationView) {
    navigationView.setNavigationItemSelectedListener(
            new NavigationView.OnNavigationItemSelectedListener() {
                @Override
                public boolean onNavigationItemSelected(MenuItem menuItem) {
                    selectDrawerItem(menuItem);
                    return true;
                }
            });
}

private void selectDrawerItem(MenuItem menuItem) {
```

```
        closeNavigationDrawer();
        switch(menuItem.getItemId()) {
            case R.id.nav_today:
                loadFragment(TodayFragment.class, menuItem.getItemId(),
menuItem.getTitle());
                break;
            case R.id.nav_report:
                loadFragment(ReportFragment.class, menuItem.getItemId(),
menuItem.getTitle());
                break;
            case  R.id.nav_categories:
                loadFragment(CategoryFragment.class, menuItem.getItemId(),
menuItem.getTitle());
                break;
            case R.id.nav_settings:
                startActivity(new Intent(MainActivity.this, SettingsActivity.class));
                break;
            default:
                loadFragment(TodayFragment.class, menuItem.getItemId(),
menuItem.getTitle());
        }
    }

    private boolean closeNavigationDrawer() {
        boolean drawerIsOpen =
mDrawerLayout.isDrawerOpen(GravityCompat.START);
        if (drawerIsOpen) {
            mDrawerLayout.closeDrawer(GravityCompat.START);
        }
        return drawerIsOpen;
    }

    public void hideNavigationBar() {
        closeNavigationDrawer();
    }

    private void loadFragment(Class fragmentClass, @IdRes int
navDrawerCheckedItemId,
                              CharSequence toolbarTitle) {
        Fragment fragment = null;
        try {
            fragment = (Fragment) fragmentClass.newInstance();
```

```
        } catch (Exception e) {
            e.printStackTrace();
        }

        insertFragment(fragment);

        // Highlight the selected item
        mNavDrawer.setCheckedItem(navDrawerCheckedItemId);
        // Set action bar title
        setTitle(toolbarTitle);
    }

    private void loadTodayFragment() {
        loadFragment(TodayFragment.class, R.id.nav_today,
                getResources().getString(R.string.nav_today));
    }
}
```

```
package com.github.ematiyuk.expensetracer.activities;

import android.os.Bundle;
import android.support.annotation.Nullable;
import android.support.v7.app.ActionBar;

import com.github.ematiyuk.expensetracer.R;
import  com.github.ematiyuk.expensetracer.fragments.SettingsFragment;

public class SettingsActivity extends BaseFragmentActivity {

    @Override
    protected void onCreate(@Nullable Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);

        insertFragment(new SettingsFragment());

        setTitle(R.string.nav_settings);

        setupActionBar();
    }

    private void setupActionBar() {
        ActionBar actionBar = getSupportActionBar();
```

```
        if (actionBar != null) {
            // Show the Up button in the action bar (toolbar).
            actionBar.setDisplayHomeAsUpEnabled(true);
        }
    }
}
package com.github.ematiyuk.expensetracer.adapters;

import android.content.Context;
import android.database.Cursor;
import android.view.View;
import android.view.ViewGroup;
import android.widget.TextView;

import com.github.ematiyuk.expensetracer.R;
import  com.github.ematiyuk.expensetracer.providers.ExpensesContract;
import com.github.ematiyuk.expensetracer.utils.Utils;
import com.twotoasters.sectioncursoradapter.SectionCursorAdapter;

public class SectionExpenseAdapter extends SectionCursorAdapter {
    private String mCurrency;

    public SectionExpenseAdapter(Context context) {
        super(context, null, 0);
    }

    public void setCurrency(String currency) {
        mCurrency = currency;
        notifyDataSetChanged();
    }

    @Override
    protected Object getSectionFromCursor(Cursor cursor) {
        String dateStr =
cursor.getString(cursor.getColumnIndexOrThrow(ExpensesContract.Expenses.D
ATE));
        return Utils.getSystemFormatDateString(mContext, dateStr);
    }

    @Override
    protected View newSectionView(Context context, Object item, ViewGroup
parent) {
```

```
        return getLayoutInflater().inflate(R.layout.expense_report_section_header,
parent, false);
    }

    @Override
    protected void bindSectionView(View convertView, Context context, int
position, Object item) {
        ((TextView) convertView).setText((String) item);
    }

    @Override
    protected View newItemView(Context context, Cursor cursor, ViewGroup
parent) {
        return getLayoutInflater().inflate(R.layout.expense_list_item, parent, false);
    }

    @Override
    protected void bindItemView(View convertView, Context context, Cursor
cursor) {
        // Find fields to populate in inflated template
        TextView tvExpenseValue = (TextView)
convertView.findViewById(R.id.expense_value_text_view);
        TextView tvExpenseCurrency = (TextView)
convertView.findViewById(R.id.expense_currency_text_view);
        TextView tvExpenseCatName = (TextView)
convertView.findViewById(R.id.expense_category_name_text_view);

        // Extract values from cursor
        float expValue =
cursor.getFloat(cursor.getColumnIndexOrThrow(ExpensesContract.Expenses.VA
LUE));
        String categoryName =
cursor.getString(cursor.getColumnIndexOrThrow(ExpensesContract.Categories.N
AME));

        // Populate views with extracted values
        tvExpenseValue.setText(Utils.formatToCurrency(expValue));
        tvExpenseCatName.setText(categoryName);
        tvExpenseCurrency.setText(mCurrency);
    }
}
package com.github.ematiyuk.expensetracer.adapters;
```

```
import android.content.Context;
import android.database.Cursor;
import android.support.v4.widget.CursorAdapter;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.TextView;

import  com.github.ematiyuk.expensetracer.providers.ExpensesContract;
import com.github.ematiyuk.expensetracer.R;
import com.github.ematiyuk.expensetracer.utils.Utils;

public class SimpleExpenseAdapter extends CursorAdapter {
   private String mCurrency;

   public SimpleExpenseAdapter(Context context) {
      super(context, null, 0);
   }

   public void setCurrency(String currency) {
      mCurrency = currency;
      notifyDataSetChanged();
   }

   // The newView method is used to inflate a new view and return it
   @Override
   public View newView(Context context, Cursor cursor, ViewGroup parent) {
      return LayoutInflater.from(context).inflate(R.layout.expense_list_item,
parent, false);
   }

   // The bindView method is used to bind all data to a given view
   @Override
   public void bindView(View view, Context context, Cursor cursor) {
      // Find fields to populate in inflated template
      TextView tvExpenseValue = (TextView)
view.findViewById(R.id.expense_value_text_view);
      TextView tvExpenseCurrency = (TextView)
view.findViewById(R.id.expense_currency_text_view);
      TextView tvExpenseCatName = (TextView)
view.findViewById(R.id.expense_category_name_text_view);
```

```
        // Extract values from cursor
        float expValue =
cursor.getFloat(cursor.getColumnIndexOrThrow(ExpensesContract.Expenses.VA
LUE));
        String categoryName =
cursor.getString(cursor.getColumnIndexOrThrow(ExpensesContract.Categories.N
AME));

        // Populate views with extracted values
        tvExpenseValue.setText(Utils.formatToCurrency(expValue));
        tvExpenseCatName.setText(categoryName);
        tvExpenseCurrency.setText(mCurrency);
    }
}
package com.github.ematiyuk.expensetracer.db;

import android.content.ContentValues;
import android.content.Context;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;

import com.github.ematiyuk.expensetracer.R;
import
com.github.ematiyuk.expensetracer.providers.ExpensesContract.Categories;
import  com.github.ematiyuk.expensetracer.providers.ExpensesContract.Expenses;

public class ExpenseDbHelper extends SQLiteOpenHelper {
    private static final int DATABASE_VERSION = 1;
    private static final String DATABASE_NAME = "expense_tracer.db";

    public static final String CATEGORIES_TABLE_NAME = "categories";
    public static final String EXPENSES_TABLE_NAME = "expenses";

    private Context mContext;

    public ExpenseDbHelper(Context ctx) {
        super(ctx, DATABASE_NAME, null, DATABASE_VERSION);
        mContext = ctx;
    }

    @Override
```

```
    public void onCreate(SQLiteDatabase db) {
        db.execSQL(CategoriesTable.CREATE_TABLE_QUERY);
        // Fill the table with predefined values
        CategoriesTable.fillTable(db, mContext);

       db.execSQL(ExpensesTable.CREATE_TABLE_QUERY);
    }

    @Override
    public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {
        /* Temporary (dummy) upgrade policy */
        db.execSQL(ExpensesTable.DELETE_TABLE_QUERY);
        db.execSQL(CategoriesTable.DELETE_TABLE_QUERY);
        onCreate(db);
    }

    private static final class CategoriesTable {
        public static final String CREATE_TABLE_QUERY =
                "CREATE TABLE " + CATEGORIES_TABLE_NAME + " (" +
                Categories._ID + " INTEGER PRIMARY KEY AUTOINCREMENT, "
+
                Categories.NAME + " TEXT NOT NULL);";

        public static final String DELETE_TABLE_QUERY =
                "DROP TABLE IF EXISTS " + CATEGORIES_TABLE_NAME + ";";

        public static void fillTable(SQLiteDatabase db, Context ctx) {
            String[] predefinedNames =
ctx.getResources().getStringArray(R.array.predefined_categories);
            ContentValues values = new ContentValues();
            for (String name : predefinedNames) {
                values.put(Categories.NAME, name);
                db.insert(CATEGORIES_TABLE_NAME, null, values);
            }
        }
    }

    private static final class ExpensesTable {
        public static final String CREATE_TABLE_QUERY =
                "CREATE TABLE " + EXPENSES_TABLE_NAME + " (" +
                Expenses._ID + " INTEGER PRIMARY KEY AUTOINCREMENT, "
+
```

```
            Expenses.VALUE + " FLOAT NOT NULL, " +
            Expenses.DATE + " DATE NOT NULL, " +
            Expenses.CATEGORY_ID + " INTEGER NOT NULL);";

        public static final String DELETE_TABLE_QUERY =
            "DROP TABLE IF EXISTS " + EXPENSES_TABLE_NAME + ";";
    }
}
package com.github.ematiyuk.expensetracer.fragments;

import android.content.ContentUris;
import android.content.ContentValues;
import android.database.Cursor;
import android.net.Uri;
import android.os.Bundle;
import android.support.annotation.Nullable;
import android.support.v4.app.Fragment;
import android.support.v4.app.LoaderManager;
import android.support.v4.content.CursorLoader;
import android.support.v4.content.Loader;
import android.view.KeyEvent;
import android.view.LayoutInflater;
import android.view.Menu;
import android.view.MenuInflater;
import android.view.MenuItem;
import android.view.View;
import android.view.ViewGroup;
import android.widget.EditText;
import android.widget.Toast;

import
com.github.ematiyuk.expensetracer.providers.ExpensesContract.Categories;
import com.github.ematiyuk.expensetracer.R;

public class CategoryEditFragment extends Fragment implements
LoaderManager.LoaderCallbacks<Cursor> {
    public static final String EXTRA_EDIT_CATEGORY =
"com.github.ematiyuk.expensetracer.edit_category";

    private EditText mCatNameEditText;
    private long mExtraValue;
```

```
    @Override
    public void onCreate(@Nullable Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);

        setHasOptionsMenu(true);
    }

    @Override
    public View onCreateView(LayoutInflater inflater, ViewGroup container,
Bundle savedInstanceState) {
        // Inflate layout for this fragment
        View rootView = inflater.inflate(R.layout.fragment_category_edit, container,
false);

        mCatNameEditText = (EditText)
rootView.findViewById(R.id.category_name_edit_text);

        // Set listener on Done (submit) button on keyboard clicked
        mCatNameEditText.setOnKeyListener(new View.OnKeyListener() {
            @Override
            public boolean onKey(View view, int keyCode, KeyEvent event) {
                if ((event.getAction() == KeyEvent.ACTION_DOWN) && (keyCode
== KeyEvent.KEYCODE_ENTER)) {
                    checkEditTextForEmptyField(mCatNameEditText);
                    return true;
                }
                return false;
            }
        });

        return rootView;
    }

    @Override
    public void onActivityCreated(@Nullable Bundle savedInstanceState) {
        super.onActivityCreated(savedInstanceState);

        mExtraValue =
getActivity().getIntent().getLongExtra(EXTRA_EDIT_CATEGORY, -1);
        // Create a new category
        if (mExtraValue < 1) {
            getActivity().setTitle(R.string.add_category);
```

```
    // Edit existing category
    } else {
        getActivity().setTitle(R.string.edit_category);
        setCategoryData();
    }
}

@Override
public void onCreateOptionsMenu(Menu menu, MenuInflater inflater) {
    super.onCreateOptionsMenu(menu, inflater);
    inflater.inflate(R.menu.fragment_category_edit, menu);
}

@Override
public boolean onOptionsItemSelected(MenuItem item) {
    switch (item.getItemId()) {
        case R.id.done_category_edit_menu_item:
            if (checkEditTextForEmptyField(mCatNameEditText)) {
                // Create a new category
                if (mExtraValue < 1) {
                    insertNewCategory();

                // Edit existing category
                } else {
                    updateCategory(mExtraValue);
                }
                getActivity().finish();
            }
            return true;
        default:
            return super.onOptionsItemSelected(item);
    }
}

private boolean checkEditTextForEmptyField(EditText editText) {
    String inputText = editText.getText().toString().trim();
    if (inputText.length() == 0) {
        editText.setError(getResources().getString(R.string.error_empty_field));
        mCatNameEditText.selectAll();
        return false;
    } else {
```

```
            return true;
        }
    }

    private void setCategoryData() {
        getLoaderManager().initLoader(0, null, this);
    }

    @Override
    public CursorLoader onCreateLoader(int id, Bundle args) {
        String[] projectionFields = new String[] {
                Categories._ID,
                Categories.NAME
        };

        Uri singleCategoryUri =
ContentUris.withAppendedId(Categories.CONTENT_URI, mExtraValue);

        return new CursorLoader(getActivity(),
                singleCategoryUri,
                projectionFields,
                null,
                null,
                null
        );
    }

    @Override
    public void onLoadFinished(Loader<Cursor> loader, Cursor data) {
        int categoryNameIndex = data.getColumnIndex(Categories.NAME);
        data.moveToFirst();
        String categoryName = data.getString(categoryNameIndex);
        mCatNameEditText.setText(categoryName);
    }

    @Override
    public void onLoaderReset(Loader loader) {
        mCatNameEditText.setText("");
    }

    private void insertNewCategory() {
        ContentValues insertValues = new ContentValues();
```

```
        insertValues.put(Categories.NAME,
mCatNameEditText.getText().toString());

        getActivity().getContentResolver().insert(
                Categories.CONTENT_URI,
                insertValues
        );

        Toast.makeText(getActivity(),
                getResources().getString(R.string.category_added),
                Toast.LENGTH_SHORT).show();
    }

    private void updateCategory(long id) {
        ContentValues updateValues = new ContentValues();
        updateValues.put(Categories.NAME,
mCatNameEditText.getText().toString());

        Uri categoryUri =
ContentUris.withAppendedId(Categories.CONTENT_URI, id);

        getActivity().getContentResolver().update(
                categoryUri,
                updateValues,
                null,
                null
        );

        Toast.makeText(getActivity(),
                getResources().getString(R.string.category_updated),
                Toast.LENGTH_SHORT).show();
    }
}
package com.github.ematiyuk.expensetracer.fragments;

import android.content.ContentUris;
import android.content.DialogInterface;
import android.content.Intent;
import android.database.Cursor;
import android.net.Uri;
import android.os.Bundle;
import android.support.annotation.Nullable;
```

```
import android.support.v4.app.Fragment;
import android.support.v4.app.LoaderManager;
import android.support.v4.content.CursorLoader;
import android.support.v4.content.Loader;
import android.support.v4.widget.SimpleCursorAdapter;
import android.support.v7.app.AlertDialog;
import  android.view.ContextMenu;
import  android.view.LayoutInflater;
import android.view.Menu;
import android.view.MenuInflater;
import android.view.MenuItem;
import android.view.View;
import android.view.ViewGroup;
import android.widget.AdapterView;
import android.widget.AdapterView.AdapterContextMenuInfo;
import android.widget.ListView;
import android.widget.Toast;

import
com.github.ematiyuk.expensetracer.providers.ExpensesContract.Categories;
import com.github.ematiyuk.expensetracer.providers.ExpensesContract.Expenses;
import com.github.ematiyuk.expensetracer.R;
import com.github.ematiyuk.expensetracer.activities.CategoryEditActivity;

public class CategoryFragment extends Fragment implements
LoaderManager.LoaderCallbacks<Cursor> {
   private ListView mCategoriesView;
   private SimpleCursorAdapter mAdapter;
   private View mProgressBar;

   @Override
   public void onCreate(@Nullable Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setHasOptionsMenu(true);
   }

   @Override
   public View onCreateView(LayoutInflater inflater, ViewGroup container,
                            Bundle savedInstanceState) {
      // Inflate layout for this fragment
      View rootView = inflater.inflate(R.layout.fragment_category, container,
false);
```

```
        mCategoriesView = (ListView)
rootView.findViewById(R.id.categories_list_view);
        mProgressBar = rootView.findViewById(R.id.categories_progress_bar);


mCategoriesView.setEmptyView(rootView.findViewById(R.id.categories_empty
_list_view));
        mCategoriesView.setOnItemClickListener(new
AdapterView.OnItemClickListener() {
            @Override
            public void onItemClick(AdapterView<?> parent, View view, int position,
long id) {
                prepareCategoryToEdit(id);
            }
        });

rootView.findViewById(R.id.add_category_button_if_empty_list).setOnClickList
ener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                prepareCategoryToCreate();
            }
        });

        registerForContextMenu(mCategoriesView);

        return rootView;
    }

    @Override
    public void onActivityCreated(@Nullable Bundle savedInstanceState) {
        super.onActivityCreated(savedInstanceState);

        mAdapter = new SimpleCursorAdapter(getActivity(),
                R.layout.category_list_item, null,
                new String[] { Categories.NAME },
                new int[] { R.id.category_name_list_item}, 0);

        mCategoriesView.setAdapter(mAdapter);

        // Initialize the CursorLoader
```

```
        getLoaderManager().initLoader(0, null, this);
    }

    @Override
    public void onResume() {
        super.onResume();
        reloadCategoryList();
    }

    @Override
    public void onCreateOptionsMenu(Menu menu, MenuInflater inflater) {
        super.onCreateOptionsMenu(menu, inflater);
        inflater.inflate(R.menu.fragment_category, menu);
    }

    @Override
    public boolean onOptionsItemSelected(MenuItem item) {
        switch (item.getItemId()) {
            case R.id.new_category_menu_item:
                prepareCategoryToCreate();
                return true;
            default:
                return super.onOptionsItemSelected(item);
        }
    }

    @Override
    public void onCreateContextMenu(ContextMenu menu, View v,
ContextMenu.ContextMenuInfo menuInfo) {
        super.onCreateContextMenu(menu, v, menuInfo);
        getActivity().getMenuInflater().inflate(R.menu.category_list_item_context,
menu);
    }

    @Override
    public boolean onContextItemSelected(MenuItem item) {
        AdapterContextMenuInfo info = (AdapterContextMenuInfo)
item.getMenuInfo();
        switch (item.getItemId()) {
            case R.id.delete_category_menu_item:
                deleteCategory(info.id);
                return true;
```

```
        default:
            return super.onContextItemSelected(item);
    }
}

@Override
public Loader<Cursor> onCreateLoader(int id, Bundle args) {
    String[] projectionFields = new String[] {
            Categories._ID,
            Categories.NAME
    };

    return new CursorLoader(getActivity(),
            Categories.CONTENT_URI,
            projectionFields,
            null,
            null,
            null
    );
}

@Override
public void onLoadFinished(Loader<Cursor> loader, Cursor data) {
    // Hide the progress bar
    mProgressBar.setVisibility(View.GONE);

    mAdapter.swapCursor(data);
}

@Override
public void onLoaderReset(Loader<Cursor> loader) {
    mAdapter.swapCursor(null);
}

private void reloadCategoryList() {
    // Show the progress bar
    mProgressBar.setVisibility(View.VISIBLE);
    // Reload data by restarting the cursor loader
    getLoaderManager().restartLoader(0, null, this);
}

private int deleteSingleCategory(long categoryId) {
```

```
        Uri uri = ContentUris.withAppendedId(Categories.CONTENT_URI,
categoryId);

        // Defines a variable to contain the number of rows deleted
        int rowsDeleted;

        // Deletes the category that matches the selection criteria
        rowsDeleted = getActivity().getContentResolver().delete(
                uri,        // the URI of the row to delete
                null,       // where clause
                null        // where args
        );

        reloadCategoryList();
        showStatusMessage(getResources().getString(R.string.category_deleted));

        return rowsDeleted;
    }

    private int deleteAssociatedExpenses(long categoryId) {
        String selection = Expenses.CATEGORY_ID + " = ?";
        String[] selectionArgs = { String.valueOf(categoryId) };

        return getActivity().getContentResolver().delete(
                Expenses.CONTENT_URI,
                selection,
                selectionArgs
        );
    }

    private void deleteCategory(final long categoryId) {
        new AlertDialog.Builder(getActivity())
                .setTitle(R.string.delete_category)
                .setMessage(R.string.delete_cat_dialog_msg)
                .setNeutralButton(android.R.string.cancel, null)
                .setPositiveButton(R.string.delete_string, new
DialogInterface.OnClickListener() {
                    @Override
                    public void onClick(DialogInterface dialogInterface, int i) {
                        int expenseRowsDeleted = deleteAssociatedExpenses(categoryId);

                        String statusMsg = getResources().getQuantityString(
```

```
                        R.plurals.expenses_deleted_plurals_msg,
expenseRowsDeleted, expenseRowsDeleted);
                    showStatusMessage(statusMsg);

                    deleteSingleCategory(categoryId);
                }
            })
            .setIcon(R.drawable.ic_dialog_alert)
            .show();
    }

    private void showStatusMessage(CharSequence text) {
        Toast.makeText(getActivity(), text, Toast.LENGTH_SHORT).show();
    }

    private void prepareCategoryToCreate() {
        startActivity(new Intent(getActivity(), CategoryEditActivity.class));
    }

    private void prepareCategoryToEdit(long id) {
        Intent intent = new Intent(getActivity(), CategoryEditActivity.class);
        intent.putExtra(CategoryEditFragment.EXTRA_EDIT_CATEGORY, id);
        startActivity(intent);
    }
}
package com.github.ematiyuk.expensetracer.fragments;

import android.app.DatePickerDialog;
import android.app.Dialog;
import android.os.Bundle;
import android.support.v4.app.DialogFragment;

import java.util.Calendar;

public class DatePickerFragment extends DialogFragment {
    private static DatePickerDialog.OnDateSetListener mListener;

    @Override
    public Dialog onCreateDialog(Bundle savedInstanceState) {
        // Use the current date as the default date in the picker
        final Calendar c = Calendar.getInstance();
        int year = c.get(Calendar.YEAR);
```

```
        int month = c.get(Calendar.MONTH);
        int day = c.get(Calendar.DAY_OF_MONTH);

        // Create a new instance of DatePickerDialog and return it
        return new DatePickerDialog(getActivity(), mListener, year, month, day);
    }

    public static DatePickerFragment
newInstance(DatePickerDialog.OnDateSetListener listener) {
        mListener = listener;
        return new DatePickerFragment();
    }
}
package com.github.ematiyuk.expensetracer.fragments;

import android.content.ContentUris;
import android.content.ContentValues;
import android.database.Cursor;
import android.net.Uri;
import android.os.Bundle;
import android.support.annotation.Nullable;
import android.support.v4.app.Fragment;
import android.support.v4.app.LoaderManager;
import android.support.v4.content.CursorLoader;
import android.support.v4.content.Loader;
import android.support.v4.widget.SimpleCursorAdapter;
import android.support.v7.widget.AppCompatSpinner;
import android.view.KeyEvent;
import android.view.LayoutInflater;
import android.view.Menu;
import android.view.MenuInflater;
import android.view.MenuItem;
import android.view.View;
import android.view.ViewGroup;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.EditText;
import android.widget.Toast;

import
com.github.ematiyuk.expensetracer.providers.ExpensesContract.Categories;
import  com.github.ematiyuk.expensetracer.providers.ExpensesContract.Expenses;
```

```
import com.github.ematiyuk.expensetracer.R;
import com.github.ematiyuk.expensetracer.utils.Utils;

import java.util.ArrayList;
import java.util.Date;

public class ExpenseEditFragment extends Fragment implements
LoaderManager.LoaderCallbacks<Cursor> {
   public static final String EXTRA_EDIT_EXPENSE =
"com.github.ematiyuk.expensetracer.edit_expense";

   private static final int EXPENSE_LOADER_ID = 1;
   private static final int CATEGORIES_LOADER_ID = 0;

   private EditText mExpValueEditText;
   private AppCompatSpinner mCategorySpinner;
   private SimpleCursorAdapter mAdapter;
   private View mCatProgressBar;
   private long mExtraValue;
   private long mExpenseCategoryId = -1;

   @Override
   public void onCreate(@Nullable Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);

      setHasOptionsMenu(true);
   }

   @Override
   public View onCreateView(LayoutInflater inflater, ViewGroup container,
Bundle savedInstanceState) {
      // Inflate layout for this fragment
      View rootView = inflater.inflate(R.layout.fragment_expense_edit, container,
false);

      mExpValueEditText = (EditText)
rootView.findViewById(R.id.expense_value_edit_text);
      mCatProgressBar = rootView.findViewById(R.id.cat_select_progress_bar);
      mCategorySpinner = (AppCompatSpinner)
rootView.findViewById(R.id.category_choose_spinner);

      setEditTextDefaultValue();
```

```
        // Set listener on Done (submit) button on keyboard clicked
        mExpValueEditText.setOnKeyListener(new View.OnKeyListener() {
            @Override
            public boolean onKey(View view, int keyCode, KeyEvent event) {
                if ((event.getAction() == KeyEvent.ACTION_DOWN) && (keyCode
== KeyEvent.KEYCODE_ENTER)) {
                    checkValueFieldForIncorrectInput();
                    return true;
                }
                return false;
            }
        });

        mCategorySpinner.setOnItemSelectedListener(new
AdapterView.OnItemSelectedListener() {
            @Override
            public void onItemSelected(AdapterView<?> parent, View view, int pos,
long id) {
                mExpenseCategoryId = id;
            }

            @Override
            public void onNothingSelected(AdapterView<?> parent) {
            }
        });

        return rootView;
    }

    @Override
    public void onActivityCreated(@Nullable Bundle savedInstanceState) {
        super.onActivityCreated(savedInstanceState);

        mAdapter = new SimpleCursorAdapter(getActivity(),
                android.R.layout.simple_spinner_item,
                null,
                new String[] { Categories.NAME },
                new int[] { android.R.id.text1 },
                0);
        // Specify the layout to use when the list of choices appears
```

```
mAdapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item);
        // Apply the adapter to the spinner
        mCategorySpinner.setAdapter(mAdapter);

        mExtraValue = getActivity().getIntent().getLongExtra(EXTRA_EDIT_EXPENSE, -1);
        // Create a new expense
        if (mExtraValue < 1) {
            getActivity().setTitle(R.string.add_expense);
            loadCategories();

            // Edit existing expense
        } else {
            getActivity().setTitle(R.string.edit_expense);
            loadExpenseData();
        }
    }

    @Override
    public void onCreateOptionsMenu(Menu menu, MenuInflater inflater) {
        super.onCreateOptionsMenu(menu, inflater);
        inflater.inflate(R.menu.fragment_expense_edit, menu);
    }

    @Override
    public boolean onOptionsItemSelected(MenuItem item) {
        switch (item.getItemId()) {
            case R.id.done_expense_edit_menu_item:
                if (checkForIncorrectInput()) {
                    // Create a new expense
                    if (mExtraValue < 1) {
                        insertNewExpense();

                    // Edit existing expense
                    } else {
                        updateExpense(mExtraValue);
                    }
                    getActivity().finish();
                }
                return true;
```

```
            default:
                return super.onOptionsItemSelected(item);
        }
    }

    private boolean checkForIncorrectInput() {
        if (!checkValueFieldForIncorrectInput()) {
            mExpValueEditText.selectAll();
            return false;
        }
        // Future check of other fields

        return true;
    }

    private boolean checkValueFieldForIncorrectInput() {
        String etValue = mExpValueEditText.getText().toString();
        try {
            if (etValue.length() == 0) {

mExpValueEditText.setError(getResources().getString(R.string.error_empty_field
));
                return false;
            } else if (Float.parseFloat(etValue) == 0.00f) {

mExpValueEditText.setError(getResources().getString(R.string.error_zero_value)
);
                return false;
            }
        } catch (Exception e) {

mExpValueEditText.setError(getResources().getString(R.string.error_incorrect_in
put));
            return false;
        }
        return true;
    }

    private void loadCategories() {
        // Show the progress bar next to category spinner
        mCatProgressBar.setVisibility(View.VISIBLE);
```

```
        getLoaderManager().initLoader(CATEGORIES_LOADER_ID, null, this);
    }

    private void loadExpenseData() {
        getLoaderManager().initLoader(EXPENSE_LOADER_ID, null, this);
        loadCategories();
    }

    private void setEditTextDefaultValue() {
        mExpValueEditText.setText(String.valueOf(0));
        mExpValueEditText.selectAll();
    }

    @Override
    public CursorLoader onCreateLoader(int id, Bundle args) {
        String[] projectionFields = null;
        Uri uri = null;
        switch (id) {
            case EXPENSE_LOADER_ID:
                projectionFields = new String[] {
                        Expenses._ID,
                        Expenses.VALUE,
                        Expenses.CATEGORY_ID
                };

                uri = ContentUris.withAppendedId(Expenses.CONTENT_URI,
mExtraValue);
                break;
            case CATEGORIES_LOADER_ID:
                projectionFields = new String[] {
                        Categories._ID,
                        Categories.NAME
                };

                uri = Categories.CONTENT_URI;
                break;
        }

        return new CursorLoader(getActivity(),
                uri,
                projectionFields,
                null,
```

```
                null,
                null
        );
    }

    @Override
    public void onLoadFinished(Loader<Cursor> loader, Cursor data) {
        switch (loader.getId()) {
            case EXPENSE_LOADER_ID:
                int expenseValueIndex = data.getColumnIndex(Expenses.VALUE);
                int expenseCategoryIdIndex =
data.getColumnIndex(Expenses.CATEGORY_ID);

                data.moveToFirst();
                mExpenseCategoryId = data.getLong(expenseCategoryIdIndex);
                updateSpinnerSelection();


mExpValueEditText.setText(String.valueOf(data.getFloat(expenseValueIndex)));
                mExpValueEditText.selectAll();
                break;
            case CATEGORIES_LOADER_ID:
                // Hide the progress bar next to category spinner
                mCatProgressBar.setVisibility(View.GONE);

                if (null == data || data.getCount() < 1) {
                    mExpenseCategoryId = -1;
                    // Fill the spinner with default values
                    ArrayList<String> defaultItems = new ArrayList<>();

defaultItems.add(getResources().getString(R.string.no_categories_string));

                    ArrayAdapter<String> tempAdapter = new
ArrayAdapter<String>(getActivity(),
                            android.R.layout.simple_spinner_item,
                            defaultItems);
                    mCategorySpinner.setAdapter(tempAdapter);
                    // Disable the spinner
                    mCategorySpinner.setEnabled(false);
                } else {
                    // Set the original adapter
                    mCategorySpinner.setAdapter(mAdapter);
```

```
                // Update spinner data
                mAdapter.swapCursor(data);
                // Enable the spinner
                mCategorySpinner.setEnabled(true);
                updateSpinnerSelection();
            }
            break;
        }
    }

    @Override
    public void onLoaderReset(Loader<Cursor> loader) {
        switch (loader.getId()) {
            case EXPENSE_LOADER_ID:
                mExpenseCategoryId = -1;
                setEditTextDefaultValue();
                break;
            case CATEGORIES_LOADER_ID:
                mAdapter.swapCursor(null);
                break;
        }
    }

    private void updateSpinnerSelection() {
        mCategorySpinner.setSelection(0);
        for (int pos = 0; pos < mAdapter.getCount(); ++pos) {
            if (mAdapter.getItemId(pos) == mExpenseCategoryId) {
                // Set spinner item selected according to the value from db
                mCategorySpinner.setSelection(pos);
                break;
            }
        }
    }

    private void insertNewExpense() {
        ContentValues insertValues = new ContentValues();
        insertValues.put(Expenses.VALUE,
Float.parseFloat(mExpValueEditText.getText().toString()));
        insertValues.put(Expenses.DATE, Utils.getDateString(new Date())); // Put
current date (today)
        insertValues.put(Expenses.CATEGORY_ID, mExpenseCategoryId);
```

```
        getActivity().getContentResolver().insert(
                Expenses.CONTENT_URI,
                insertValues
        );

        Toast.makeText(getActivity(),
                getResources().getString(R.string.expense_added),
                Toast.LENGTH_SHORT).show();
    }

    private void updateExpense(long id) {
        ContentValues updateValues = new ContentValues();
        updateValues.put(Expenses.VALUE,
Float.parseFloat(mExpValueEditText.getText().toString()));
        updateValues.put(Expenses.CATEGORY_ID, mExpenseCategoryId);

        Uri expenseUri = ContentUris.withAppendedId(Expenses.CONTENT_URI,
id);

        getActivity().getContentResolver().update(
                expenseUri,
                updateValues,
                null,
                null
        );

        Toast.makeText(getActivity(),
                getResources().getString(R.string.expense_updated),
                Toast.LENGTH_SHORT).show();
    }
}
package com.github.ematiyuk.expensetracer.providers;

import android.net.Uri;
import android.provider.BaseColumns;

public final class ExpensesContract {
    /**
     * The authority for the expenses provider
     */
    public static final String AUTHORITY =
"com.github.ematiyuk.expensetracer.provider";
```

```
    /**
     * The content:// style URI for expenses provider
     */
    public static final Uri AUTHORITY_URI = Uri.parse("content://" +
AUTHORITY);

    /**
     * The contract class cannot be instantiated
     */
    private ExpensesContract(){}

    public static class Categories implements BaseColumns, CategoriesColumns {
        /**
         * This utility class cannot be instantiated
         */
        private Categories() {}

        /**
         * The content:// style URI for this table
         */
        public static final Uri CONTENT_URI =
Uri.withAppendedPath(AUTHORITY_URI, "categories");

        /**
         * The MIME type of {@link #CONTENT_URI} providing a directory of
categories.
         */
        public static final String CONTENT_TYPE =

"vnd.android.cursor.dir/vnd.ematiyuk.expensetracer.provider.expense_category";

        /**
         * The MIME type of a {@link #CONTENT_URI} sub-directory of a single
category.
         */
        public static final String CONTENT_ITEM_TYPE =

"vnd.android.cursor.item/vnd.ematiyuk.expensetracer.provider.expense_category"
;

        /**
         * Sort by ascending order of _id column (the order as items were added).
```

```
        */
        public static final String DEFAULT_SORT_ORDER = _ID + " ASC";
    }

    public static class Expenses implements BaseColumns, ExpensesColumns {
        /**
         * This utility class cannot be instantiated
         */
        private Expenses() {}

        /**
         * The content:// style URI for this table
         */
        public static final Uri CONTENT_URI =
Uri.withAppendedPath(AUTHORITY_URI, "expenses");

        /**
         * The MIME type of {@link #CONTENT_URI} providing a directory of
expenses.
        */
        public static final String CONTENT_TYPE =
                "vnd.android.cursor.dir/vnd.ematiyuk.expensetracer.provider.expense";

        /**
         * The MIME type of a {@link #CONTENT_URI} sub-directory of a single
expense.
         */
        public static final String CONTENT_ITEM_TYPE =

"vnd.android.cursor.item/vnd.ematiyuk.expensetracer.provider.expense";

        /**
         * Sort by descending order of date (the most recent items are at the end).
         */
        public static final String DEFAULT_SORT_ORDER = DATE + " ASC";

        /**
         * Expense sum value column name to return for joined tables
         */
        public static final String VALUES_SUM = "values_sum";
    }
```

```
    public static class ExpensesWithCategories implements BaseColumns {
        /**
         * This utility class cannot be instantiated.
         */
        private ExpensesWithCategories() {}

        /**
         * The content:// style URI for this table.
         */
        public static final Uri CONTENT_URI =
Uri.withAppendedPath(AUTHORITY_URI, "expensesWithCategories");

        /**
         * The MIME type of {@link #CONTENT_URI} providing a directory of
expenses with categories.
         */
        public static final String CONTENT_TYPE =

"vnd.android.cursor.dir/vnd.ematiyuk.expensetracer.provider.expense_with_categ
ory";

        /**
         * The MIME type of a {@link #CONTENT_URI} sub-directory of a single
expense with a category.
         */
//        public static final String CONTENT_ITEM_TYPE =
//
"vnd.android.cursor.item/vnd.ematiyuk.expensetracer.provider.expense_with_cate
gory";

        /**
         * The content:// style URI for this joined table to filter items by a specific
date.
         */
        public static final Uri DATE_CONTENT_URI =
Uri.withAppendedPath(CONTENT_URI, "date");

        /**
         * The content:// style URI for this joined table to filter items by a specific
date range.
         */
```

```
        public static final Uri DATE_RANGE_CONTENT_URI =
Uri.withAppendedPath(CONTENT_URI, "dateRange");

        /**
         * The content:// style URI for getting sum of expense values
         * for this joined table by "date" filter.
         */
        public static final Uri SUM_DATE_CONTENT_URI =
Uri.withAppendedPath(DATE_CONTENT_URI, "sum");

        /**
         * The content:// style URI for getting sum of expense values
         * for this joined table by "date range" filter.
         */
        public static final Uri SUM_DATE_RANGE_CONTENT_URI =
                Uri.withAppendedPath(DATE_RANGE_CONTENT_URI, "sum");
    }

    protected interface CategoriesColumns {
        String NAME = "name";
    }

    protected interface ExpensesColumns {
        String VALUE = "value";
        String DATE = "date";
        String CATEGORY_ID = "category_id";
    }
}
package com.github.ematiyuk.expensetracer.providers;

import android.content.ContentProvider;
import android.content.ContentUris;
import android.content.ContentValues;
import android.content.UriMatcher;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;
import android.net.Uri;

import com.github.ematiyuk.expensetracer.db.ExpenseDbHelper;
import
com.github.ematiyuk.expensetracer.providers.ExpensesContract.Categories;
```

```
import com.github.ematiyuk.expensetracer.providers.ExpensesContract.Expenses;
import
com.github.ematiyuk.expensetracer.providers.ExpensesContract.ExpensesWithCa
tegories;

import static
com.github.ematiyuk.expensetracer.db.ExpenseDbHelper.CATEGORIES_TABLE
_NAME;
import static
com.github.ematiyuk.expensetracer.db.ExpenseDbHelper.EXPENSES_TABLE_
NAME;

public class ExpensesProvider extends ContentProvider {
   public static final int EXPENSES = 10;
   public static final int EXPENSES_ID = 11;

   public static final int CATEGORIES = 20;
   public static final int CATEGORIES_ID = 21;

   public static final int EXPENSES_WITH_CATEGORIES = 30;
   public static final int EXPENSES_WITH_CATEGORIES_DATE = 31;
   public static final int EXPENSES_WITH_CATEGORIES_DATE_RANGE =
32;
   public static final int EXPENSES_WITH_CATEGORIES_SUM_DATE = 33;
   public static final int
EXPENSES_WITH_CATEGORIES_SUM_DATE_RANGE = 34;

   private SQLiteOpenHelper mDbHelper;
   private SQLiteDatabase mDatabase;

   private static final UriMatcher sUriMatcher = new
UriMatcher(UriMatcher.NO_MATCH);

   static {
      sUriMatcher.addURI(ExpensesContract.AUTHORITY, "expenses",
EXPENSES);
      sUriMatcher.addURI(ExpensesContract.AUTHORITY, "expenses/#",
EXPENSES_ID);
      sUriMatcher.addURI(ExpensesContract.AUTHORITY, "categories",
CATEGORIES);
      sUriMatcher.addURI(ExpensesContract.AUTHORITY, "categories/#",
CATEGORIES_ID);
```

```
        sUriMatcher.addURI(ExpensesContract.AUTHORITY,
"expensesWithCategories",
                EXPENSES_WITH_CATEGORIES);
        sUriMatcher.addURI(ExpensesContract.AUTHORITY,
"expensesWithCategories/date",
                EXPENSES_WITH_CATEGORIES_DATE);
        sUriMatcher.addURI(ExpensesContract.AUTHORITY,
"expensesWithCategories/dateRange",
                EXPENSES_WITH_CATEGORIES_DATE_RANGE);
        sUriMatcher.addURI(ExpensesContract.AUTHORITY,
"expensesWithCategories/date/sum",
                EXPENSES_WITH_CATEGORIES_SUM_DATE);
        sUriMatcher.addURI(ExpensesContract.AUTHORITY,
"expensesWithCategories/dateRange/sum",
                EXPENSES_WITH_CATEGORIES_SUM_DATE_RANGE);
    }

    /*
     * SELECT expenses._id, expenses.value, categories.name, expenses.date
     * FROM expenses JOIN categories
     * ON expenses.category_id = categories._id
     */
    private static final String
BASE_SELECT_JOIN_EXPENSES_CATEGORIES_QUERY =
            "SELECT " + EXPENSES_TABLE_NAME + "." + Expenses._ID + ", " +
                    EXPENSES_TABLE_NAME + "." + Expenses.VALUE + ", " +
                    CATEGORIES_TABLE_NAME + "." + Categories.NAME + ", " +
                    EXPENSES_TABLE_NAME + "." + Expenses.DATE + " FROM " +
                    EXPENSES_TABLE_NAME + " JOIN " +
CATEGORIES_TABLE_NAME + " ON " +
                    EXPENSES_TABLE_NAME + "." + Expenses.CATEGORY_ID + "
= " +
                    CATEGORIES_TABLE_NAME + "." + Categories._ID;

    /**
     * <p>
     * Initializes the provider.
     * </p>
     *
     * <i>Note</i>: provider is not created until a
     * {@link android.content.ContentResolver ContentResolver} object tries to
access it.
```

```
     *
     * @return <code>true</code> if the provider was successfully loaded,
<code>false</code> otherwise
     */
    @Override
    public boolean onCreate() {
        mDbHelper = new ExpenseDbHelper(getContext());
        return true;
    }

    @Override
    public Cursor query(Uri uri, String[] projection, String selection, String[]
selectionArgs, String sortOrder) {
        Cursor cursor;
        String table;
        String rawQuery;
        mDatabase = mDbHelper.getReadableDatabase();
        switch (sUriMatcher.match(uri)) {
            // The incoming URI is for all of categories
            case CATEGORIES:
                table = CATEGORIES_TABLE_NAME;
                sortOrder = (sortOrder == null || sortOrder.isEmpty())
                        ? Categories.DEFAULT_SORT_ORDER
                        : sortOrder;
                break;

            // The incoming URI is for a single row from categories
            case CATEGORIES_ID:
                table = CATEGORIES_TABLE_NAME;
                // Defines selection criteria for the row to query
                selection = Categories._ID + " = ?";
                selectionArgs = new String[]{ uri.getLastPathSegment() };
                break;

            // The incoming URI is for all of expenses
            case EXPENSES:
                table = EXPENSES_TABLE_NAME;
                sortOrder = (sortOrder == null || sortOrder.isEmpty())
                        ? Expenses.DEFAULT_SORT_ORDER
                        : sortOrder;
                break;
```

```
        // The incoming URI is for a single row from expenses
        case EXPENSES_ID:
            table = EXPENSES_TABLE_NAME;
            // Defines selection criteria for the row to query
            selection = Expenses._ID + " = ?";
            selectionArgs = new String[]{ uri.getLastPathSegment() };
            break;

        // The incoming URI is for all expenses with categories
        case EXPENSES_WITH_CATEGORIES:
            /*
             * SELECT expenses._id, expenses.value, categories.name,
expenses.date
             * FROM expenses JOIN categories
             * ON expenses.category_id = categories._id
             */
            return
mDatabase.rawQuery(BASE_SELECT_JOIN_EXPENSES_CATEGORIES_QU
ERY, null);

        // The incoming URI is for the expenses with categories for a specific date
        case EXPENSES_WITH_CATEGORIES_DATE:
            /*
             * SELECT expenses._id, expenses.value, categories.name,
expenses.date
             * FROM expenses JOIN categories
             * ON expenses.category_id = categories._id
             * WHERE expense.date = ?
             */
            rawQuery =
                    BASE_SELECT_JOIN_EXPENSES_CATEGORIES_QUERY + "
WHERE " +
                    EXPENSES_TABLE_NAME + "." + Expenses.DATE + " = ?";

            return mDatabase.rawQuery(rawQuery, selectionArgs);

        // The incoming URI is for the expense values sum for a specific date
range
        case EXPENSES_WITH_CATEGORIES_SUM_DATE:
            /*
             * SELECT SUM(expenses.value) as values_sum
             * FROM expenses WHERE expenses.date = ?
```

```
             */
            rawQuery =
                    "SELECT SUM(" + EXPENSES_TABLE_NAME + "." +
Expenses.VALUE + ") as " +
                    Expenses.VALUES_SUM + " FROM " +
EXPENSES_TABLE_NAME +
                    " WHERE " + EXPENSES_TABLE_NAME + "." +
Expenses.DATE + " = ?";

            return mDatabase.rawQuery(rawQuery, selectionArgs);

        // The incoming URI is for the expenses with categories for a specific date
range
        case EXPENSES_WITH_CATEGORIES_DATE_RANGE:
            /*
             * SELECT expenses._id, expenses.value, categories.name,
expenses.date
             * FROM expenses JOIN categories
             * ON expenses.category_id = categories._id
             * WHERE expense.date BETWEEN ? AND ?
             */
            rawQuery =
                    BASE_SELECT_JOIN_EXPENSES_CATEGORIES_QUERY + "
WHERE " +
                    EXPENSES_TABLE_NAME + "." + Expenses.DATE + "
BETWEEN ? AND ?";

            return mDatabase.rawQuery(rawQuery, selectionArgs);

        // The incoming URI is for the expense values sum for a specific date
range
        case EXPENSES_WITH_CATEGORIES_SUM_DATE_RANGE:
            /*
             * SELECT SUM(expenses.value) as values_sum
        *       FROM expenses WHERE expense.date BETWEEN ? AND ?
             */
            rawQuery =
                    "SELECT SUM(" + EXPENSES_TABLE_NAME + "." +
Expenses.VALUE + ") as " +
                    Expenses.VALUES_SUM + " FROM " +
EXPENSES_TABLE_NAME +
```

```
                    " WHERE " + EXPENSES_TABLE_NAME + "." +
Expenses.DATE + " BETWEEN ? AND ?";

            return mDatabase.rawQuery(rawQuery, selectionArgs);

        default:
            throw new IllegalArgumentException("Unknown Uri provided.");
    }

        cursor = mDatabase.query(
                table,
                projection,
                selection,
                selectionArgs,
                null,
                null,
                sortOrder
        );

        return cursor;
    }

    @Override
    public Uri insert(Uri uri, ContentValues values) {
        String table;
        Uri contentUri;
        switch (sUriMatcher.match(uri)) {
            // The incoming URI is for all of categories
            case CATEGORIES:
                table = CATEGORIES_TABLE_NAME;
                contentUri = Categories.CONTENT_URI;
                break;
            // The incoming URI is for all of expenses
            case EXPENSES:
                table = EXPENSES_TABLE_NAME;
                contentUri = Expenses.CONTENT_URI;
                break;
            // The incoming URI is for a single row from categories
            case CATEGORIES_ID:
            // The incoming URI is for a single row from expenses
            case EXPENSES_ID:
```

```
            throw new UnsupportedOperationException("Inserting rows with
specified IDs is forbidden.");
        case EXPENSES_WITH_CATEGORIES:
        case EXPENSES_WITH_CATEGORIES_DATE:
        case EXPENSES_WITH_CATEGORIES_DATE_RANGE:
        case EXPENSES_WITH_CATEGORIES_SUM_DATE:
        case EXPENSES_WITH_CATEGORIES_SUM_DATE_RANGE:
            throw new UnsupportedOperationException("Modifying joined results
is forbidden.");
        default:
            throw new IllegalArgumentException("Unknown Uri provided.");
    }

    mDatabase = mDbHelper.getWritableDatabase();

    long newRowID = mDatabase.insert(
            table,
            null,
            values
    );

    Uri newItemUri = ContentUris.withAppendedId(contentUri, newRowID);

    return (newRowID < 1) ? null : newItemUri;
}

@Override
public int delete(Uri uri, String selection, String[] selectionArgs) {
    String table;
    switch (sUriMatcher.match(uri)) {
        // The incoming URI is for a single row from categories
        case CATEGORIES_ID:
            table = CATEGORIES_TABLE_NAME;
            // Defines selection criteria for the row to delete
            selection = Categories._ID + " = ?";
            selectionArgs = new String[]{ uri.getLastPathSegment() };
            break;
        // The incoming URI is for all of expenses
        case EXPENSES:
            table = EXPENSES_TABLE_NAME;
            break;
        // The incoming URI is for a single row from expenses
```

```
            case EXPENSES_ID:
                table = EXPENSES_TABLE_NAME;
                // Defines selection criteria for the row to delete
                selection = Expenses._ID + " = ?";
                selectionArgs = new String[]{ uri.getLastPathSegment() };
                break;
            // The incoming URI is for all of categories
            case CATEGORIES:
                throw new UnsupportedOperationException("Removing multiple rows
from the table is forbidden.");
            case EXPENSES_WITH_CATEGORIES:
            case EXPENSES_WITH_CATEGORIES_DATE:
            case EXPENSES_WITH_CATEGORIES_DATE_RANGE:
            case EXPENSES_WITH_CATEGORIES_SUM_DATE:
            case EXPENSES_WITH_CATEGORIES_SUM_DATE_RANGE:
                throw new UnsupportedOperationException("Modifying joined results
is forbidden.");
            default:
                throw new IllegalArgumentException("Unknown Uri provided.");
        }

        mDatabase = mDbHelper.getWritableDatabase();

        return mDatabase.delete(
                table,
                selection,
                selectionArgs
        );
    }

    @Override
    public int update(Uri uri, ContentValues values, String selection, String[]
selectionArgs) {
        String table;
        switch (sUriMatcher.match(uri)) {
            // The incoming URI is for a single row from categories
            case CATEGORIES_ID:
                table = CATEGORIES_TABLE_NAME;
                // Defines selection criteria for the row to delete
                selection = Categories._ID + " = ?";
                selectionArgs = new String[]{ uri.getLastPathSegment() };
                break;
```

```
            // The incoming URI is for a single row from expenses
            case EXPENSES_ID:
                table = EXPENSES_TABLE_NAME;
                // Defines selection criteria for the row to delete
                selection = Expenses._ID + " = ?";
                selectionArgs = new String[]{ uri.getLastPathSegment() };
                break;
            // The incoming URI is for all of categories
            case CATEGORIES:
            // The incoming URI is for all of expenses
            case EXPENSES:
                throw new UnsupportedOperationException("Updating multiple table
rows is forbidden.");
            case EXPENSES_WITH_CATEGORIES:
            case EXPENSES_WITH_CATEGORIES_DATE:
            case EXPENSES_WITH_CATEGORIES_DATE_RANGE:
            case EXPENSES_WITH_CATEGORIES_SUM_DATE:
            case EXPENSES_WITH_CATEGORIES_SUM_DATE_RANGE:
                throw new UnsupportedOperationException("Modifying joined results
is forbidden.");
            default:
                throw new IllegalArgumentException("Unknown Uri provided.");
        }

        mDatabase = mDbHelper.getWritableDatabase();

        return mDatabase.update(
                table,
                values,
                selection,
                selectionArgs
        );
    }

    @Override
    public String getType(Uri uri) {
        final int match = sUriMatcher.match(uri);
        switch (match) {
            case CATEGORIES:
                return Categories.CONTENT_TYPE;
            case CATEGORIES_ID:
                return Categories.CONTENT_ITEM_TYPE;
```

```
            case EXPENSES:
                return Expenses.CONTENT_TYPE;
            case EXPENSES_ID:
                return Expenses.CONTENT_ITEM_TYPE;
            case EXPENSES_WITH_CATEGORIES:
            case EXPENSES_WITH_CATEGORIES_DATE:
            case EXPENSES_WITH_CATEGORIES_DATE_RANGE:
            case EXPENSES_WITH_CATEGORIES_SUM_DATE:
            case EXPENSES_WITH_CATEGORIES_SUM_DATE_RANGE:
                return ExpensesWithCategories.CONTENT_TYPE;
            default:
                return null;
        }
    }
}
package com.github.ematiyuk.expensetracer.utils;

import android.content.Context;

import java.text.NumberFormat;
import java.text.ParseException;
import java.text.SimpleDateFormat;
import java.util.Date;
import java.util.Locale;

public class Utils {
    public static String getSystemFormatDateString(Context context, Date date) {
        java.text.DateFormat dateFormat =
android.text.format.DateFormat.getDateFormat(context);
        return dateFormat.format(date);
    }

    public static String getSystemFormatDateString(Context context, String
dateString) {
        java.text.DateFormat dateFormat =
android.text.format.DateFormat.getDateFormat(context);
        return  dateFormat.format(stringToDate(dateString));
    }

    public static String getDateString(Date date) {
        SimpleDateFormat dateFormat = new SimpleDateFormat("MM/dd/yy",
Locale.US);
```

```
        try {
            return dateFormat.format(date);
        } catch (Exception pe) {
            pe.printStackTrace();
            return "no_date";
        }
    }

    private static Date stringToDate(String dateString) {
        SimpleDateFormat dateFormat = new SimpleDateFormat("MM/dd/yy",
Locale.US);
        try {
            return dateFormat.parse(dateString);
        } catch (ParseException pe) {
            pe.printStackTrace();
            return null;
        }
    }

    public static String formatToCurrency(float value) {
        final NumberFormat numberFormat = NumberFormat.getNumberInstance();
        numberFormat.setMaximumFractionDigits(2);
        numberFormat.setMinimumFractionDigits(2);
        return numberFormat.format(value);
    }
}
package com.github.ematiyuk.expensetracer;

import android.app.Application;
import android.test.ApplicationTestCase;

/**
 * <a href="http://d.android.com/tools/testing/testing_android.html">Testing
Fundamentals</a>
 */
public class ApplicationTest extends ApplicationTestCase<Application> {
    public ApplicationTest() {
        super(Application.class);
    }
}
package com.github.ematiyuk.expensetracer;
```

```
import org.junit.Test;

import static org.junit.Assert.*;

/**
 * To work on unit tests, switch the Test Artifact in the Build Variants view.
 */
public class ExampleUnitTest {
    @Test
    public void addition_isCorrect() throws Exception {
        assertEquals(4, 2 + 2);
    }
}
```

13.2. GitHub & Project Demo Link

GITHUB: https://github.com/IBM-EPBL/IBM-Project-36310-1660294085

PROJECT DEMO LINK:
https://drive.google.com/file/d/1HWG5uPRJcb27UbAG2iH1Qo8DsoDHy1BM/view?usp=share_link