

# Mobile Application Development with Android

## Developing a basic cost-income management app



Author: Zilin Song

[zilin.song@stud.uni-goettingen.de](mailto:zilin.song@stud.uni-goettingen.de)

23<sup>th</sup> August 2021

## 目录

1 Project Proposal .....	3
1.1 Short description .....	3
1.2 Functional specification.....	3
1.3 Must-have features .....	3
1.4 Nice-to-have features.....	4
1.5 Timeline .....	4
2 Project Structure.....	5
2.1 MainActivity .....	5
2.2 MoneyActivity .....	6
2.3 StatisticalActivity .....	7
2.4 ChartActivity .....	8
2.5 NotificationService .....	9
2.6 Setting .....	9
2.7 SharedPreferences .....	9
3 Encountered Problems .....	10
3.1 Chart generation time is too long .....	10
4 Further Development.....	10

# 1 Project Proposal

## 1.1 Short description

We will try to design an app that can be used to record daily income and expenses, we hope that this app can help users understand their own financial status, users can intuitively understand their spending status, can help users save money and avoid unnecessary expenses. There are many apps have similar function, but most of them are all paid for or filled with lots of advertising. So, we thought it was necessary to have an app of our own.

## 1.2 Functional specification

The app has 3 activities, the main Activity will display a list of recent expenses and income. In addition to the main activity, we have an Activity to record specific information about each expense or income, we also have an Activity to display statistics on expenses and income for the month or the week, or the period defined by user.

We are going to use a local room database to save the past routes and corresponding, In the record Activity, the user can use camera to make a picture about the expenses and incomes.

If we have enough time, Data can be presented as a statistical chart in the statistical Activity. But the function of displaying data in a purely digital way will definitely be implemented.

## 1.3 Must-have features

### Feature 1 The Main Activity:

- Date, amount, type should be showed in the Listview
- When the element of the List being clicked, the Activity for record will start, and the information that already exists about the element will be showed in the Activity for record.

### Feature 2 The record Activity:

- The Activity will be started, when the user want to add a new expense or income, or the user want to change some information about a expense or income, which is already exist.
- The use should give: Data, amount, type. If it is necessary, the user could also save the picture and detailed description.
- The data will be send back to main Activity for sure.

### Feature 3 The statistical Activity:

- Show the statistics on expenses and income for the month or the week.

### Feature 4 Reminder:

- 8am remind users to use the app.(can be turn off)

#### **Feature 5 Data save:**

- Store all data in local.

#### **Feature 6 Setting:**

- The remind can be turn off.

## **1.4 Nice-to-have features**

#### **Optional Feature 1 Warning**

- If the cost of this week is too high, every time uses open the app, the app will show a warning.

#### **Optional Feature 2 Reminder**

- Each Montag will remind the spending status about last week.
- Each 1st will remind the spending status about last month.

#### **Optional Feature 3 The statistical Activity:**

- Can show the data in a Graph.
- The time period for displaying data can be set.

## **1.5 Timeline**

Step	Deadline
Project Setup	20.7
Feature 1	25.7
Feature 2	25.7
Feature 3	1.8
Feature 4	1.8
Feature 5	3.8
Feature 6	3.8
Optional Feature 1	7.8
Optional Feature 2	7.8
Optional Feature 3&Update the Database	17.8
Result show & Project cleanup & nice to have features	19.8
Final Report	22.8

## 2 Project Structure

### 2.1 MainActivity

MainActivity implemented three Features: Feature 1 and optional Feature 1 and 2

Feature 1: A simple situation of all expenses will be displayed in the MainActivity. Click on each expense, some detailed information will be displayed, and it can be update.

Optional Feature 1: The MainActivity can get the Weekly cost, if it's more than 300, then the App will send a warning notifications.

Optional Feature 2: The MainActivity will send a notifications every Monday and every 1<sup>st</sup>, to remind users to check the income and cost of the previous week or month.

There are three buttons at the bottom of MainActivity, they are chart statistics (see section 2.4), text statistics (see section 2.3), and add new records (see section 2.2).

The OnStop method has been Override, the NotificationService will be Start When the app been Close (see section 2.5).

In the Setting menu, the User can close or open the reminders. (see section 2.6).

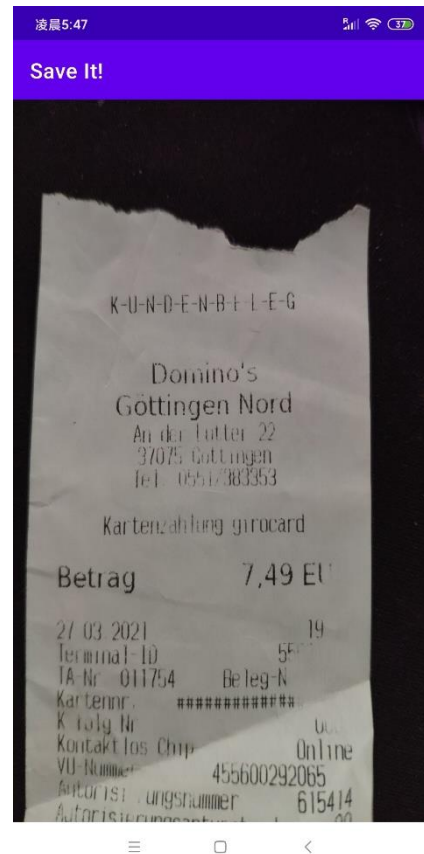


## 2.2 MoneyActivity

MoneyActivity implemented Feature2.

This Activity could record the details of each income or cost, such as value, date, introduction, and pictures. If it is to modify an existing project, then when this Activity is generated, the existing information will be displayed.

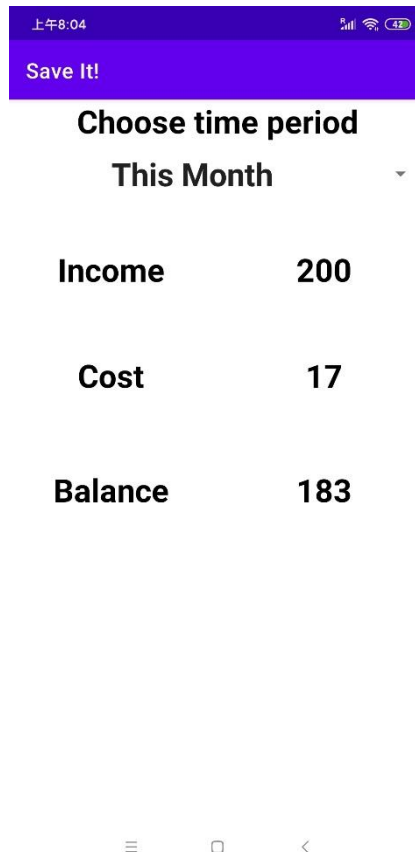
When an item has a picture, click on the picture, the picture will be displayed in full screen.



## 2.3 StatisticalActivity

StatisticalActivity implemented Feature 3.

In this Statistical, users can get recent income, cost and balance. I provide users with four time periods. Through this function, users can understand their own situation more intuitively

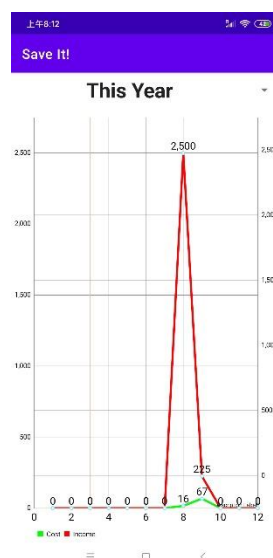


## 2.4 ChartActivity

StatisticalActivity implemented optional Feature 3.

I use the MPAndroidChart library to realize the function of displaying chart on the Android system. This library can generate many types of charts. In this app I use line chart.

Users can view their own income and cost, and the results will be displayed in a LineChart, users can view the situation this year and this month.





## 2.5 NotificationService

This service can still send Notification at a specific time when the App is closed. It will be called when MainActivity reaches Onstop. Through this service, the program can realize the reminder function Feature 4.

## 2.6 Setting

I added a menu to MainActivity to implement the Feature 6.

When the users click on the sub-item in the setting menu, users can turn off various types of Notification.



## 2.7 SharedPreferences

Because this program needs to save very little content locally, I used the SharedPreferences method to save the data.

When the program is closed, the data in the money list and setting will be saved locally, and when the program is opened, these data will be read.

It is worth mentioning that when the ArrayList is saved through SharedPreferences, it needs to be converted to a Gson object and then saved.

## **3 Encountered Problems**

### **3.1 Chart generation time is too long**

In ChartActivity, the time to generate the chart is very long, usually cost 20 seconds, and it takes nearly 20 seconds to switch between the this-month chart to the this-year chart. This is very inefficient, but I can't find a way to optimize this problem.

## **4 Further Development**

Since this app has not been used for a long time, there may be items that are currently unknown. I will continue to use this APP in my life to record my consumption and income. If I find a problem, I will try my best to solve it. If I need more features in use, I am also very happy to add these features.