Chongqing University of Technology

Graduate Design (Thesis) Task Book

Title Android-based Internet Note-taking Software Design and Implementation

(Start and end dates of the mission: December 2020-June 2021)

计算机科学与工程 学院

计算机科学与技术 专业 6201703L1 班

学生姓名 安昊铭 学 号 62017010084

指导教师 傅由甲 系 主 任 卢玲

二级学院院长 杨 武

Preface

A notebook called draft something for some days or forever. A notebook is also known as a notepad, writing pad, drawing pad. We can say another way what is notebook "A notebook (also known as Notepad, writing pad, drawing pad, or legal Notepad) is a book or a stack of pages, usually used for note-taking or memo, other writing, drawing, or scrapbook purposes". Now a day's Notepad is essential for everyone. We cannot do without it. Every day anyone needs to keep in password, E-mail, Id, phone number, Name anytime. From my earlier, I wished to research software, programming, android related field. But all the supervisor was booked by others students. But my passion for coding, I request to be my supervisor to Fu Youjia he has accepted me. Very thanks to my tutor Fu Youjia finally supervised me. Otherwise, maybe I couldn't research android programming. I want to explore a notepad that is an essential tool for everybody how can develop it. Perhaps many people have noted something but lost it any time; this is significantly soreness. Here may have necessary note but lost it is very harmful. I develop an android notepad app by thinking about the people who are lost their draft.

Here I develop an Internet Notepad based on android. This was the first time for me to make an android application. I started it in the first week of March, but June first is still abode by it. Some time I faced a terrible bug when I wanted to give up. But the attempt makes me successful today. Believing one thing is taking me here that "everything is possible in the real World for continuous attempting" without this passion, that is the abortive attempt. Finally, I have successfully done it. I plan to upload the app to the google play store after some days. The first version is simple, but the next upgraded version will be developed with more extra features.

Abstract

Computers are widely used, rapid Internet development and programming technology are also developing rapidly. This paper aims to understand the implementations of the functions of Notepad and use the theory of software engineering to understand the method and step of software development through the process to develop a simple video Notepad in the development platform of windows. First of all, this paper introduces some popular Notepads

in brief on the market, such as Google keep Notepad, etc. then to understand some functions of these Notepads, all kinds of particular coding format file they can play, to analyze the advantages and disadvantages of various coding formats:

1. Development of the software development platforms and technologies used:
2. Functional nodules:
3. Functional design:
4. Function realization.

Finally, a summary of the software development process and some of my experience and feelings are described.

This note application uses the Android Studio that based on java to apply on the Android Platform. The main part brings out the function of note, image Note, Web Link, and SQLite light database to save data. The note function can protect users' privacy by connecting with airy and accounts.

Table of Contents

Chapter One Introduction

1.1 Research purpose and interpretation

At present, with the popularization of mobile devices and the improvement of mobile device hardware, the functions of mobile devices are becoming more and more complete. Goodness makes the system platform of mobile devices more and more popular. The most common mobile platforms in China are Android, IOS and Windows Phone, etc. Since Google acquired Android in 2005, Google Many human resources and financial resources have been invested in mobile phone mobile applications based on the Android operating system. The rapid promotion of Android technology has extensively promoted the development of mobile application software [1].

Therefore, in Android, The mobile terminal gave birth to various Android software. According to statistics, as of January 2019, the Android system market share market has risen from 71.93% last two years to 87%. From the data point of view, the Android platform occupies the market share dominance. Therefore, for the Android market developed for so many years, there is still a constant need for new talents to go Pioneering and innovation.

Another reason for choosing the Android platform in this design is based on the five significant advantages of the Android platform:

- Openness,
- Free from the shackles of operators,
- Rich hardware options,
- Unrestricted developers,
- Seamless integration of Google application.

Although the core function of mobile phones is communication and contact, they are becoming more and more intelligent and time-consuming nowadays. As far as the mobile phone market

is concerned, many people have regarded it as a personal assistant in Work and life, thus Also promoted the rapid development of batch after batch of mobile phone application software.
Notepad software has gradually become one of the leading application software of mobile phones, mainly to meet people's business records. Based on the mobile office requirements such as business query, etc., this design has made some tastes on the Notepad. Trial development. At the same time of development, the functions of map and status are also added to make the Notepad and The map become a comprehensive application, making it more simple, convenient and user-friendly.

The purpose of this project is on Android. On the system's mobile phone development platform, research and develop a notepad software, and provide notepad function services.
First of all, the primary function of the Notepad is to take notes. The first thing that mobile phone users use is text notes. The form of text is displayed and stored. As user needs increase, you may want to use graphics instead of text to remember. If you open the Notepad between users, you can contact the transaction information you have recorded when you see the picture. This saves typing. The trouble with words will be more straightforward. Or it is the cross-application of text and pictures, which allows users to choose their preferences.
My Notes Pad way of taking notes is more free and convenient. So the meaning of this function is to allow simple note information to be displayed in text and graphics.

Expression is more colourful. Secondly, while supporting traditional text memos, voice memos should also be supported. Because users need to pursue a simpler way of note-taking, you don't need to input text manually but take notes directly. The voice is saved directly, which is conducive to the next time the user clicks the button while viewing, you can play the corresponding recording information. This is not so good for some eyes, or more like it hearing users are very attractive.
Again, if the Notepad has a lot of information, and users need to quickly find the note information they need, then the content search is handy. For those busy with business or who often write memos, this content retrieval function can bring a lot of convenience to users. Let them use mobile phones more efficiently, save time and be more efficient Work and life.
Finally, for business people, or users who often use mailboxes, sometimes they want to check their mailboxes and view the information in the Notepad and get it all at once. Therefore, the synchronization mailbox function of Notepad can bring more parts to users able and convenient.

1.2 Problem description

With the progress of the times, network technology emerges endlessly. The amount of information has expanded rapidly, and the whole person. A similar society has become an information society, and people deal with information and data. Management and processing have entered the stage of automation, networking and socialization. The rise of blogs makes more people on the Internet. A space for displaying themselves has been built. At the same time, more people are willing to share enjoy personal mood diary, personal collection, and ordinary blog content.

The purpose of this thesis is to make a network diary. I want to increase the number of network diaries. Add, delete, and modify the contents of the three major parts. Design and complete the network diary so that it has text Chapter classification, date and time, title, sub-title, display, background management and other functions.

1.3 Analysis of research condition at home and abroad

There is currently much more popular notepad software on the vast Internet. They are Google keep, one-note, Xiaomi Memo, Evernote, Note Everything, Meku notes etc. Evernote's software interface is refreshing, and you need to register and log in before using it. The icon layout is more coordinated; you can write content, add tags, and upload pictures, audios, videos, and texts. Attachments such as files; featured functions include searching and sending notes, positioning services, and synchronization. In terms of source occupancy, memory occupies the most and CPU occupancy is moderate.

Figure 1: Google Keep

Google Keep has advanced interface functions in the software interface; you can view and create new notes, reminders notification, the menu function is relatively Rich; not only text content is supported for notes, and you can choose the colour of the desktop widget, font size, etc. the note pad Google keep also have an android version. Features in terms of functions, you can move into folders and share, backup, restore, and set protection passwords; in terms of resource occupation, the memory occupancy is relatively medium, and the CPU occupies the least.

The interface of Note Everything is simple, with buttons for creating new notes and searching on the top, and the menu function is very Rich; support text, drawing, voice, picture, list, gallery, video, barcode and other forms, can be fixed display of notes; the feature is that a single note is encrypted, data backup, restore, import, everywhere, create shortcuts Type; the memory occupies the least, and the CPU occupies the middle.

The Meku Memo interface is more exquisite, and the menu function is relatively simple. You can select categories, tags, attachments, and support taking pictures and real-time recording. Features are note search and classification, network synchronization and note sharing, moderate memory usage. Among them, the CPU occupies the most.

1.4 Development trend

With the continuous development and promotion of 4G applications, users will increasingly need more personalized and high-quality multimedia volume data services; users hope to seamlessly use 4G networks for office, online transactions, and games anytime and anywhere.

Play entertainment, enjoy film and television programs, listen to and download music, etc. According to observations, in the near future, moving hands the machine terminal will have new developments in the following aspects.

First of all, provide innovative reminder services. The mobile phone can closely cooperate with the user and monitor the user's personal information. Personalized settings (maintained locally or in the cloud), when essential time points or key things require user attention, the mobile phone will send out a "reminder" service to the user, which includes schedule reminders, traffic conditions, best driving routes, best berths, promotions, real-time news, sports events, weather conditions, stock market quotes, friend activities, birthdays of relatives and friends, etc.

Secondly, to provide a virtual reality experience, the mobile phone can use sensors and peripheral devices to understand your side environment, and based on the collected

information, intelligently provide you with helpful information, such as pets raised in the online world objects can use audio equipment to express their calls, and use motors and position sensors to transmit their jumping, leaping and other behaviours.

Information; it can also provide a price reference for related similar products when the user is shopping and remind the user of the nearby. According to the actual scene, a store is better and cheaper, providing users with the use method of the product being controlled promptly. Then, use the advantages of the Internet of Things. With the help of ubiquitous sensors, you can sense and share the surroundings. The world's massive amounts of information will be integrated into the "cloud" to help users obtain timely and accurate information, breath information, traffic conditions. In addition, with the help of the Internet of Things, users can share resources conveniently and quickly and coordinate assistance and interaction. Such as end-to-end multiplayer games, photo sharing, book sharing, music sharing, etc. then, as an economic tool, in the case of underdeveloped traffic or information, it helps users find the best market, obtain valuable help information, and allow users to engage in the rate of return of economic activities.

Finally, more innovative and safer devices, as smartphones continue to become famous and more innovative, mobile phones Software updates and upgrades will become easier. They will provide users with tools or information so that users can. The power and power to decide which content can be browsed, downloaded or shared. It will also be better in terms of security, able to Effectively help users manage the acquired content, protect users' privacy and mobile phone-based financial activities such as electronic wallets, online payments, online trade, etc.

1.5 Feasibility analysis

This thesis is divided into seven chapters to complete; the primary feasibility is Technical feasibility, Economic feasibility, Operation feasibility.

1.5.1 Technical feasibility

The technical feasibility analysis mainly analyzes whether the existing technical conditions can complete the development work, the hardware, whether the software configuration can meet the needs of developers, the number, level, and sources of various technical staff, etc. According to statistics according to the current mobile platform, users using the Android platform still account for the majority of the versions are all ten or higher. Some mobile phones a few years ago are also six or higher, and for those using this system, the

minimum version requirement is Android 5, which is the same as the minimum version of most Google apps in supermarkets. For user experience, there will be no version incompatibility issues. For developers, the system Android Studio is used for development, and its SDK version is 30.

This project needs an android studio and an exemplary configuration for android development. The computer in the environment is sufficient, and there are specific requirements for the computer itself. It can use windows and other The version, mac Os, Linux Ubuntu and other operating systems. I used here windows and Linux Ubuntu Version.

1.5.2 Economic feasibility

Because this software is developed by a single person, a computer will do, basically Doesn't need too much cost. It is economically very feasible. Economic feasibility mainly conducts cost-benefit analysis to determine whether the system is worth developing from a financial point of view. Notepads are an indispensable part of people's work and life, and traditional paper notepads are not only a waste of resources. The source and content are leaked, and you need always to pay attention to replace the new notebook, and it will take up part of the collection—storage space. Compared with paper notepads, notepads on the Android platform can not only save resources, but you can also achieve the effect of using and remembering.

1.5.3 Operational feasibility

The user's habits and mobile phone limitations are fully considered when designing the interface. However, this is tough for a single person. The program almost simple; this program only involves development environment configuration, familiarity with Android components. It is not too difficult, so the project is fully manoeuvrable.

There are divided into some chapter of this paper the current chapter task is chapter one, and I will bring up the problem we are about to encounter so that I can complete it in later chapters, and Develop a process plan for project development; Chapter 2 Software Requirements Analysis, installation and configuration. Chapter 3 Functional Requirements; In this chapter described the primary function of the projects. The fourth chapter is the detailed design of the software. In this chapter, I will once again improve the various operations of the diary. Perform a detailed analysis, and complete every detail that will appear in the system. Through this part, I will complete the theoretical part of diary making, Chapter 5 Program Development, as the name suggests. In this chapter, I will implement software coding for the

diary, and explain each section of coding in practice the meaning of the specific completion of the journal add, edit, delete, database connection these parts; Chapter 6 Software testing and debugging. In this chapter, I test and run the software and find the software's Insufficiency, make corrections. The seventh chapter concluding remarks, this chapter, is in the production project, personal a summary of his feelings and gains; the eighth chapter appendix, this chapter is the end of this thesis.

1.5.4 Legal feasibility analysis

Before developing software, it must be determined whether it violates a specific law or relevant country regulations. No conflict. And this notepad application does not conflict with any laws or applicable regulations of my Country or my Study country China so that it can be approved in practice.

1.6 Basic content

The primary content is the research and development of notepad software under the android mobile phone platform. Specific design and The functions implemented are:

1) The system is divided into HTTP server-side and Android mobile client. The server side is responsible for saving the client's note data, or it can send the saved note data to the client, the client can save the data locally, or it can save the data to the server on the network, or receive note data from the server to synchronize the data.
2) Each client has an account name, and the user logs on to the server-side before the data can be synchronized from the corresponding account of the server.
3) Users can classify notes through the client, making it easy for users to record, view and modify by category and to drag unclassified notes into a variety.
4) Each note includes the category, record time, note content, and labels. Users can set multiple tags for each letter to find.
5) Clients provide to-do functions, which include title, content, location, reminder time. When the reminder time is up, you can alert the user.
6) The design realizes the three main principles of "add new note", "edit content", and "delete current note" The required functional modules.
7) Analyze and solve several technical issues in the implementation, such as selecting components and selecting storage methods select.

8) Perform tests and analyze the results. Of course, the essential functions of Notepad, create new files, modify existing files, delete files, view existing files

Functions such as document creation must be completed first. Can write content, edit and delete, in addition to supporting text notes also support pictures and other forms to diversify the way of note-taking. The interface design of Notepad software strives to be concise, giving people a refreshing feeling, and the icons and buttons are arranged in a coordinated manner. The bureau has shown that the menu function should be relatively simple so that the user can operate conveniently and not be complicated. For Notepad, The realization of the characteristic function is to support voice memos, allowing users to have a different memo experience; at the same time, they can also search for pens. Remember, search for the files that the user wants to get from the complicated memo files so as to give the user a reminder Life brings high efficiency so that users can experience the practicality of this software. And can practice the synchronization mailbox function; it is so convenient and convenient for users to check the mail on the computer or mobile phone to see the note information. Notepad software should have moderate memory usage and moderate CPU usage so that the software runs smoothly.

Chapter 2 Installation and Configuration of Development Environment

2.1 Introduction to the development kit and its tools

Android uses Java as the development language but have another language is available is Kotlin but I familiar with Java, so I chose Java, and JDK is a necessary development package for java development. Android Studio It is a very good open-source IDE; under the "cooperation" of many plug-ins, it can fully meet the requirements from enterprise-level Java application to mobile terminal java game development. Google official also provides Eclipse-based android development plug-in ADT, but this software development chooses Android as the development IDE because of my familiarities. Android is a free and open-source operating system based on Linux, mainly used in mobile devices, such as smartphones and tablets, Tv, which are led and developed by Google Inc. and the Open Mobile Alliance. Not yet a Unified Chinese name, more people in the mainland in China use "Android" or "安卓" Initially; Andy Rubin founded Android Incorporation in Palo Alto, California, the United States in October 2003. Google acquired android Incorporation on August 17 2005. Since then, it is in

the subsidiary of Google Incorporation., it mainly supports mobile phones. In August 2005, it was acquired and injected by Google. 2007 In November, Google formed an Open Mobile Alliance with 84 hardware manufacturers, software developers, and telecom operators. Same as R&D and improved Android system. Subsequently, Google released the Android source code. Finally, in October 2008, The first Android smartphone was released. Android gradually extend to tablet computers and other fields, such as TVs, digital cameras, game consoles, etc. In the first quarter of 2011, Android's global market share surpassed the Symbian system for the first time, ranking first in the world. In the fourth quarter of 2013, Degree, the global market share of Android platform mobile phones has reached 78.1%. Developed by Google on September 24, 2013, the Android operating system is welcoming its 10th birthday, and the number of devices using this system in the world has reached 2.5 billion units.

The basic components included in the JDK include:

javac-the compiler, which converts the source program into bytecode, jar-packaging tool, package related class files into one file, Javadoc-documentation generator, extract documentation from source code comments, jdb-debugger, error-checking tool, java-run the compiled java program (.class suffix). Applet viewer: applet viewer, a type of Java that executes Java applets on HTML files Browser.

Javah: Generate C procedures that can call Java procedures, or create C procedures that can be called by Java programs

Header file.

Javap: Java disassembler, display the accessible functions and data in the compiled class file, and display at the same time byte code meaning.

Jconsole: Java tool for system debugging and monitoring

Android Studio is an open-source software development project focused on Based on IntelliJ IDEA development, a highly integrated development environment (IDE) for Android application development. In addition to IntelliJ's powerful code editor and developer tools, Android Studio also provides more features to improve your work efficiency when building Android applications, such as:

- Flexible Gradle-based build system
- Fast and feature-rich themes
- A unified environment where you can develop for all Android devices
- Apply changes to change code and resources to your running application without restarting your application

- Code templates and GitHub integration can help you build common application functions and import sample codes
- Extensive testing tools and frameworks
- Lint tool to capture performance, availability, version and other issues
- C++ and NDK support
- Support for Google Cloud Platform, you can easily integrate Google Cloud Messaging and App Engine. This page introduces the basic functions of Android Studio.

2.2 Steps to build Android development platform

First, go to https://developer.android.com/studio/, download Android Studio integrated development environment(IDE) And unzipped it. Then go to https://www.oracle.com/java/technologies/javase-downloads.html Download JDK. It should remember that before install android studio has to be pre-installed JDK. After download, install the first android studio and click next and notice to keep SDK in a specific folder.

After installation, Open Android Studio. Go to "Start a new Android Studio project" Under the "Quick Start" menu. In the "Create New Project" window that opens, name your project "HelloWorld" or your desire name. If you want, please set the company name* as needed. The company name will be used in the file as a package name that is reversed. Note the location of the project file and make changes as needed. Click Next. Make sure that "phones and tablets" is the only box checked. If you plan to test the application on your phone, please make sure that the minimum SDK is lower than the operating system level of your phone. For SDK, Click on SDK manager and select your desire SDK version and download it.

2.3 Hardware environment

2.3.1 Windows

- 64-bit Microsoft machine and the Operating system Windows® 8/10.
- x86_64 CPU architecture; second-generation Intel Core or later, or AMD CPU supporting Windows Hypervisor
- 8 GB RAM or more
- At least 8 GB free disk space (IDE + Android SDK + Android Emulator)
- 1280 x 800 minimum screen resolution

2.3.2 Linux

- Any 64-bit Linux distribution supports Gnome, KDE, or Unity DE; GNU C Library (Glibc) 2.31 or later.
- x86_64 CPU architecture; 2nd generation Intel Core or newer, or AMD processor with support for AMD Virtualization (AMD-V) and SSSE3
- 8 GB RAM or more, 8 GB of available disk space minimum (IDE + Android SDK + Android Emulator)
- 1280 x 800 minimum screen resolution

2.4 Software environment

1. Operating System Windows 10 or Linux.
2. Android Studio
3. Android SDK integrated environment.

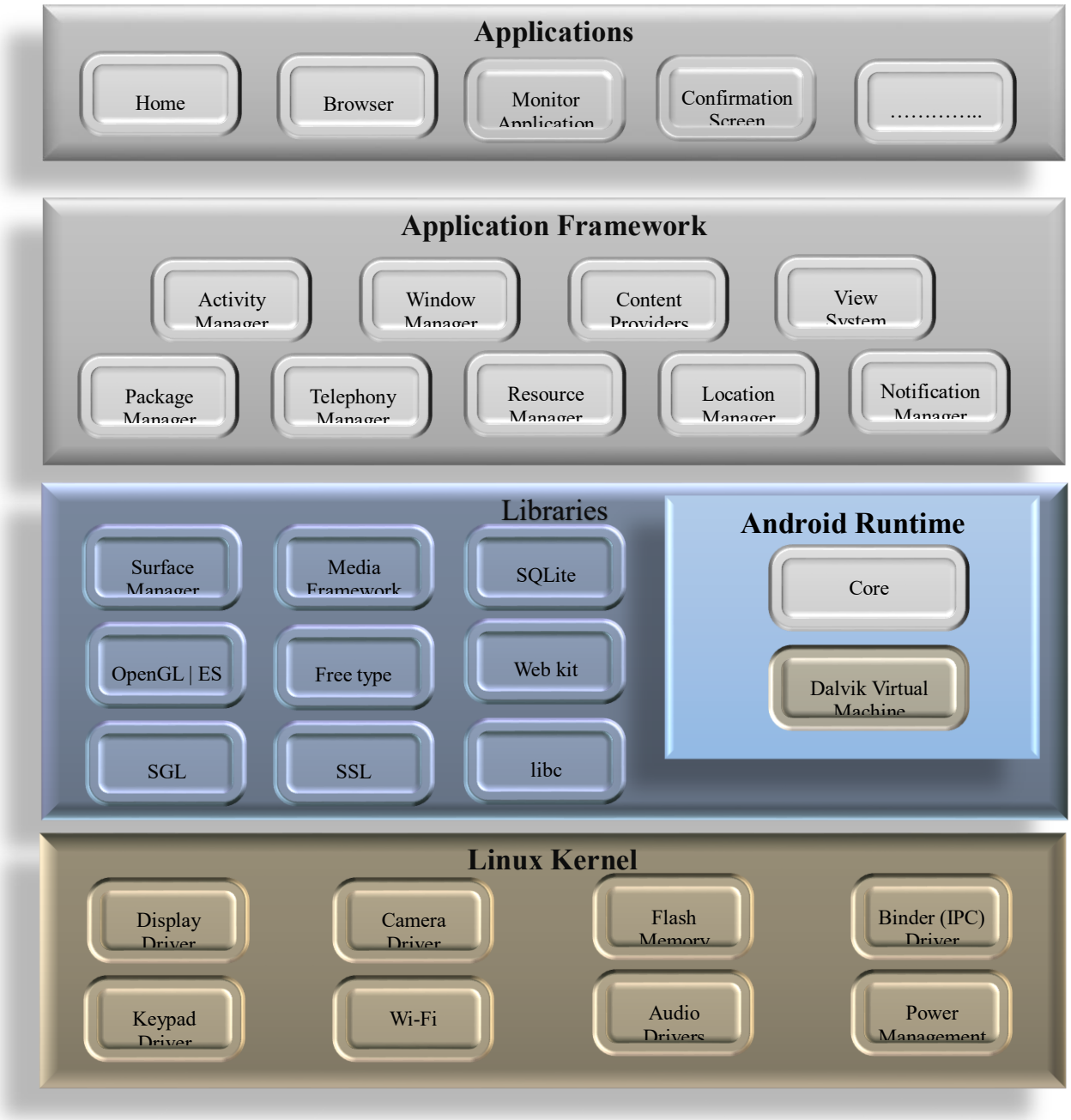
2.5 System Architecture

The Android system architecture is the same as its operating system; The Android architecture is a software stack of components to support mobile device requirements. The Android software stack contains a Linux kernel, a collection of c/c++ libraries exposed through application framework services, runtimes, and applications. The following are the main components of the android architecture, they are

- application
- Android framework
- Android runtime
- Platform library
- Linux kernel

Among these components, Linux Kernel is the main component of Android, providing its operating system functions for mobile devices and the Dalvik virtual machine (DVM) responsible for running mobile applications. using a layered architecture as shown in the figure below:

Figure 2.5-Android's system architecture and its operating system layered architecture



From the perspective of the architecture diagram, Android is divided into four layers. From the high-level to the low-level, they are the application layer and the application layer. Program framework layer, system runtime library layer and Linux kernel layer.

Application:

Android will be released together with a series of core application packages, including client, SMS Short message program, calendar, map, browser, contact management program, etc. All applications are written in the JAVA language.

Application framework:

Developers also have full access to the API framework used by the core application. The architecture of the application The design simplifies the reuse of components; any application can publish its functional blocks and any other Any application can use the function blocks it publishes (but must follow the security of the framework) same, the application reuse mechanism also allows users to easily replace program components.

Hidden Behind each application is a series of services and systems, including Rich and extensible views that can be used to build applications, including lists, grids, text boxes, buttons, and even embedding Enter the web browser.

Content Providers (Content Providers) allows an application to access the data of another application Data (such as a contact database) or share their data.

Resource Manager (Resource Manager) provides access to non-code resources, such as local strings, graphs Shape, and layout files (Layout files).

Notification Manager so that the application can display the self in the status bar the defined prompt message.

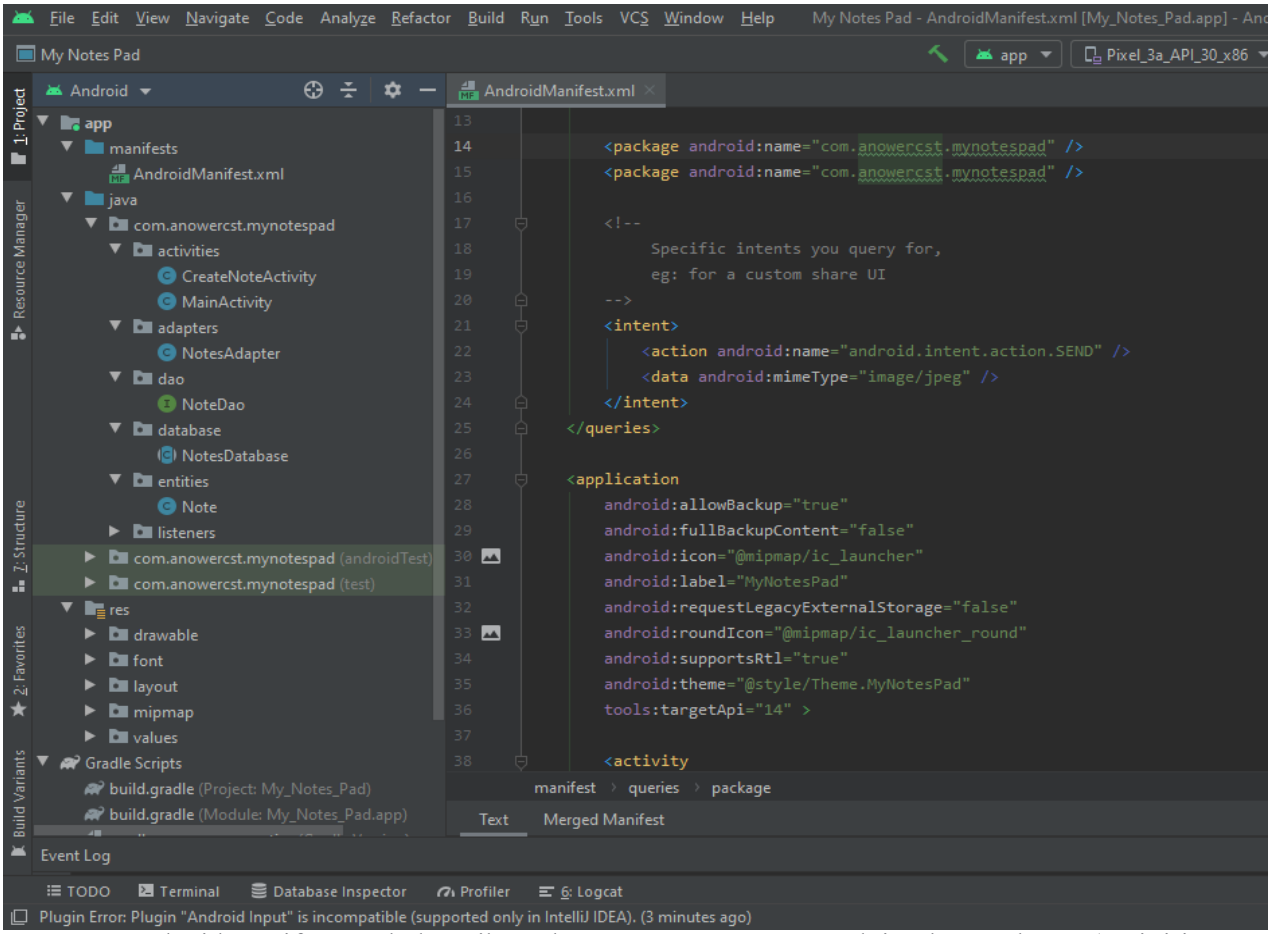
Activity Manager (Activity Manager) is used to manage the application life cycle and provide a commonly used navigation back function.

System runtime android includes some C/C++ libraries, which different components in the Android system can use. It provides services to developers through the Android application framework.

2.6 The main structure of the project

The main structure of the project is shown in the figure below:

Figure 2.6-Project Structure



1. AndroidManifest.xml describes the components exposed in the package (activities, services, etc.), their respective implementation classes, various data that can be processed, and start locations. In addition to declaring procedures Activities, content providers, Services, And Intent Receivers. Here I stick when I import photos, but it didn't work correctly, and solving this bug took five days.
2. Java folder: Java under the com.anowercst.mynotespad package, there are three package folders. In the first package com.anowercst.mynotespad there are five packages for different activities. Under the activities folder is the Create Note activity class of the system: AddActivity.java is an Activity to increase the function, which is realized by setting up the monitoring of two buttons.

Now save or exit the input text. Adapter.java is implemented by the basic operation functions of the database Activity; the functions implemented by the main functions in the class are: open and close the database, get the time, insert Data, delete input, get data, query data, update data, generate a title based on content, create table and delete the table.

1. Java(generated) folder: The java(generated) folder is automatically generated by the project. Java is the identifier of each resource under the project. Responsible for the index of all resources.
2. res folder: Res is the resource directory, res resource directory, which contains the resource files in the project and compiles them into the application in the application;

when resources are added to this directory, they will be automatically recorded R.java. The res directory stores all programs Resource files used in the sequence. "Resource files" refer to data files, pictures, etc. The subdirectories are drawable, values, font, mipmap, layout. Screen layout directory, activity_main.xml is the layout file of the main interface, add.xml is the increase The layout file of the data page, check_notepad.xml is the layout file for the search function, click.xml It is the layout file of several function buttons, list.xml Is the layout file that displays the note list interface, modtitle.xml is the layout file of the text box needed to modify the function. Values. Parameter value directory, save Play various texts and some data that the software needs to display.

Chapter 3 System Design

3.1 Functional requirements

Functional requirements (FR) are descriptions of the services that the software must provide. It describes a software system or its components. It can be calculation, data manipulation, business process, user interaction, or any other specific function that defines the function that the system may perform.

3.1.1 User Triggered Event

The user clicks on the screen to interact with the data. The relevant buttons on the notepad are requested by the operation Input device. The screen is an output device used to output information to the user. An event is an essential message from the human operation. The trigger time is shown in the table below. Notepad system may send Responses to all incidents and their execution results.

	Event	System Response	Result
1	Tap the software system from the phone screen	Call function entry, start System, enter the software	Enter the software, display Note Home page
2	Click Menu, select add note	Call add function	Enter the add interface
3	Click on one of the notes	Call the view note function	Enter the detailed interface
4	Click Menu on the note detail interface, Edit the notes	Call the modification function	Enter the modification interface

5	Click Menu on the note detail interface, Notes can be deleted	Call delete function	delete note
6	Click Menu on the note list interface, opt-out	Call the exit function	Exit the software

3.1.2 Basic Needs Control of Notepad

The system use case diagram describes the system in the user's eyes, that is, what functions the user wants the system to have and where to pass. These operations complete these functions. A use case represents a way for users to interact with the design, as mentioned earlier.

However, the best way to identify use cases is to analyze the system from the participants' perspective. In Android Notepad, the first participant is the user. The system E-R diagram is shown in the figure below, which describes the system should be what kind of function does it have.

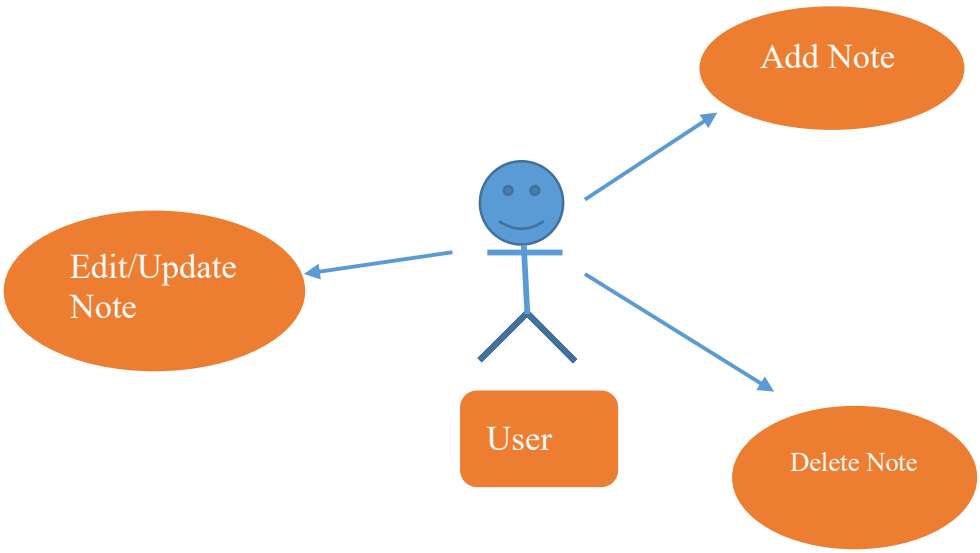


Figure 3.1.2- Basic Needs Control of Notepad

3.2 System energy requirements

3.2.1 Response time

Generally speaking, the response time of an application developed based on Android largely depends on the security of the hardware configuration and system version of the android device. Therefore, the hardware configuration and system version of the user's Android device is both. It will have a particular impact on the response time of the application.

3.2.2 Stability

The application is a local application, and users can use the application only through their own hardware.

3.2.3 Security

Android is an open-source system that is relatively stable, and the application does not need to be connected to the network, so there is no information about the risk of network leakage.

Chapter 4 Program Design

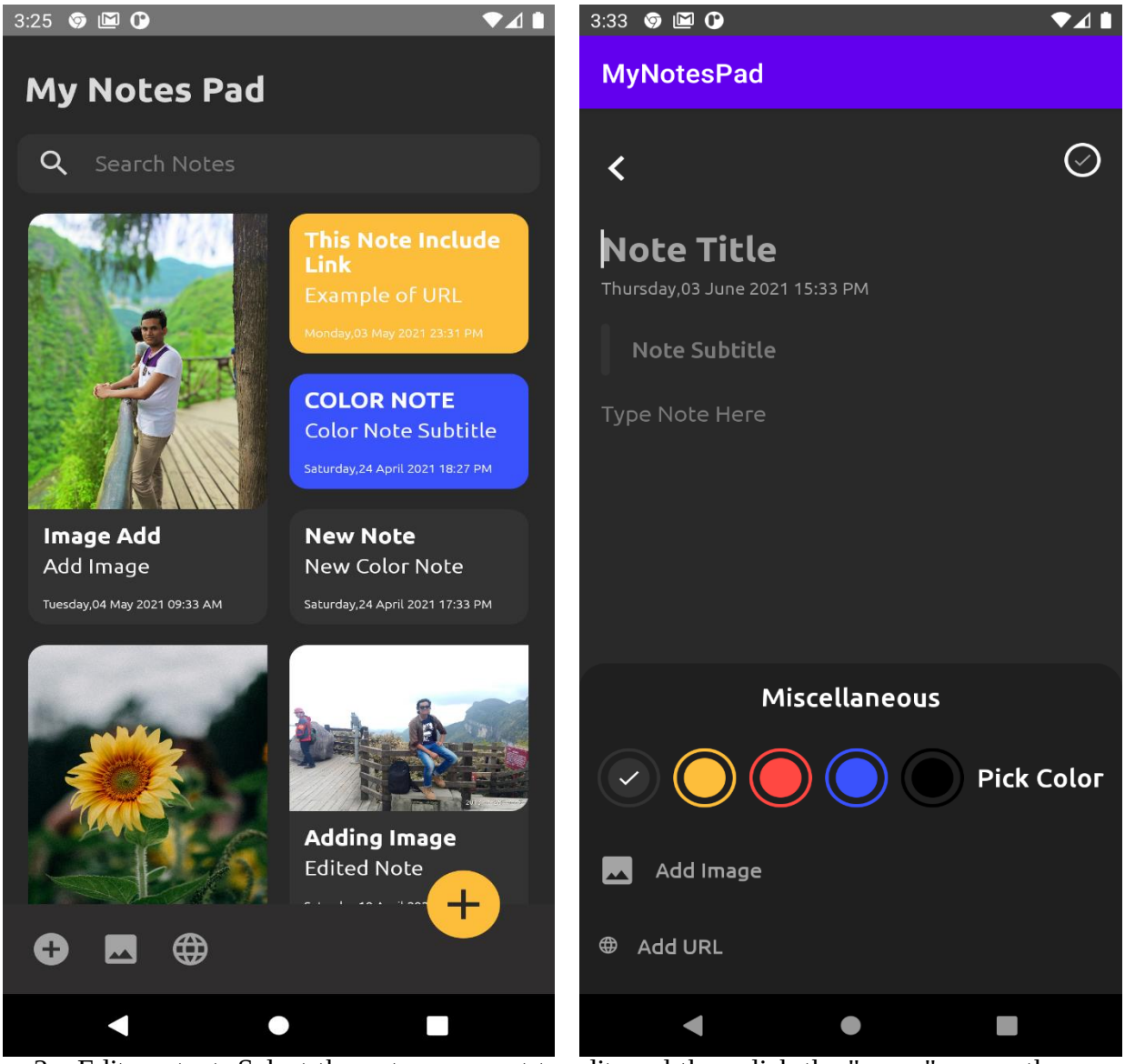
4.1 The design of the notebook component

This project involves the following components: Text View: "Notepad", "New Note", "Edit Note" and other titles Edit View: "Title of Notepad", "Sub Title of the Note", "Adding Image", "Add URL", "Content", etc. Button: "OK" button Menu: "Add new note", "Compile content", "Delete current note", etc.

4.2 Logical Design of Notepad

1. The first is to add a new note: If there is no note currently, there is only one menu option ,"add new note" after clicking "menu", After writing the note, click "OK" to save.

Figure 4.2-Add New Note



2. Edit content: Select the note you want to edit, and then click the "menu" menu, there will be three options "New" Note", "Edit content", "Delete current note", click "Edit content" to edit the selected note, and then click "OK" to save it.
3. Delete note Click the up and down keys, select the note you want to delete, then click the "menu" menu, and then click "Delete Previous note" to delete the selected note.

4.3 Implementation of Notepad Storage

A total of 5 data storage methods are provided in Android. The application is private, so if you need to use the data in other applications, use Content Providers offered by Android. Content Providers: A particular type of data storage provided by Android, which provides a set of Standard interfaces to obtain and manipulate data. Shared Preference: used to store data in the "key-value pairs" format, it is light. The magnitude key-value storage mechanism can only store basic data types. Files: It operates on files through and. But in Android, a file is an application Private; one application cannot read and write files of other applications. SQLite: A standard database provided by Android supports SQL statements Network: Store and obtain data through the network.

4.3.1 Save note

```
private void saveNote(){
    if(inputNoteTitle.getText().toString().trim().isEmpty()){
        Toast.makeText(this, "Note Title can't be Empty!",
Toast.LENGTH_SHORT).show();
        return;
    }
    else if(inputNoteSubtitle.getText().toString().trim().isEmpty()
&& inputNoteText.getText().toString().trim().isEmpty()){
        Toast.makeText(this, "Note can't be Empty!",
Toast.LENGTH_SHORT).show();
        return;
    }
    final Note note = new Note();
    note.setTitle(inputNoteTitle.getText().toString());
    note.setSubtitle(inputNoteSubtitle.getText().toString());
    note.setNoteText(inputNoteText.getText().toString());
    note.setDateTime(textDateTime.getText().toString());
    // save note color
    note.setColor(selectedNoteColor);
    note.setImagePath(selectedImagePath);
    // Adding URL
    if(layoutWebURL.getVisibility() == View.VISIBLE){
        note.setWebLink(textWebURL.getText().toString());
    }
    if(alreadyAvailableNote !=null){
        note.setId(alreadyAvailableNote.getId());
    }
    @SuppressLint("StaticFieldLeak")
    class SaveNoteTask extends AsyncTask<Void, Void, Void> {
        @Override
```

```
        protected Void doInBackground(Void... voids) {
NotesDatabase.getDatabase(getApplicationContext()).noteDao().insertN
ote(note);
            return null;
        }
        @Override
        protected void onPostExecute(Void aVoid) {
            super.onPostExecute(aVoid);
            Intent intent = new Intent();
            setResult(RESULT_OK,intent);
            finish();
        }
    }
    new SaveNoteTask().execute();
}
```

4.3.2 Files for data storage

```
private String getPathFromUri(Uri contentUri){
    String filePath;
    Cursor cursor = getContentResolver()
            .query(contentUri,null,null,null,null);
    if(cursor == null){
        filePath = contentUri.getPath();
    }else {
        cursor.moveToFirst();
        int index = cursor.getColumnIndex("_data");
        filePath =cursor.getString(index);
        cursor.close();
    }
    return filePath;
}
```

4.3.3 Data storage network

There are many ways to obtain and save data resources through the network, and tto store data on the network, such as The data to be saved is uploaded to the server in the form of files, emails are sent, etc. Let's take a look at how to read network files.

```
String myString = null;
try
{
/* Define the URL of the address we want to visit */
```

```
URL uri = new URL("");
/* Open this url connection*/
URLConnection ucon = uri.openConnection();
/* Get InputStream from the link above */
InputStream is = ucon.getInputStream();
BufferedInputStream bis = new BufferedInputStream(is);
ByteArrayBuffer baf = new ByteArrayBuffer(100);
int current = 0;
/* Read until the end of the file*/
while ((current = bis.read()) != -1)
{
baf.append((byte) current);
}
myString = new String(baf.toByteArray());
}
```

4.3.4 SQLite for data storage

```
package com.anowercst.mynotespad.database;

import android.content.Context;

import androidx.room.Database;

import androidx.room.Room;

import androidx.room.RoomDatabase;

import com.anowercst.mynotespad.dao.NoteDao;

import com.anowercst.mynotespad.entities.Note;


@Database(entities = Note.class, version = 1, exportSchema = false)

public abstract class NotesDatabase extends RoomDatabase {

    private static NotesDatabase notesDatabase;

    public static synchronized NotesDatabase getDatabase(Context

context){

        if(notesDatabase == null){

            notesDatabase = Room.databaseBuilder(

                    context,

                    NotesDatabase.class,

                    "notes_db"

                    ).build();

        }
```

```
        return notesDatabase;
    }
    public abstract NoteDao noteDao();
}
```

4.3.5 Content Providers for data storage

```
private void getNotes(final int requestCode, final boolean
isNoteDeleted){
    @SuppressLint("StaticFieldLeak")
    class getNotesTask extends AsyncTask<Void, Void, List<Note>> {
        @Override
        protected List<Note> doInBackground(Void... voids) {
            return NotesDatabase
                    .getDatabase(getApplicationContext())
                    .noteDao().getAllNotes();
        }
        @Override
        protected void onPostExecute(List<Note> notes) {
            super.onPostExecute(notes);
            //Log.d("MY_NOTES",notes.toString());
           /* if(noteList.size() == 0){
                noteList.addAll(notes);
                notesAdapter.notifyDataSetChanged();
            }else{
                noteList.add(0,notes.get(0));
                notesAdapter.notifyItemInserted(0);
            }
            notesRecyclerView.smoothScrollToPosition(0);*/
            if(requestCode == REQUEST_CODE_SHOW_NOTES){
                noteList.addAll(notes);
                notesAdapter.notifyDataSetChanged();
            }else if(requestCode == REQUEST_CODE_ADD_NOTE){
                noteList.add(0,notes.get(0));
```

```
                notesAdapter.notifyItemInserted(0);
                notesRecyclerView.smoothScrollToPosition(0);
            }else if(requestCode == REQUEST_CODE_UPDATE_NOTE){
                noteList.remove(noteClickedPosition);
                if(isNoteDeleted){
notesAdapter.notifyItemRemoved(noteClickedPosition);
                }else {
noteList.add(noteClickedPosition,notes.get(noteClickedPosition));
notesAdapter.notifyItemChanged(noteClickedPosition);
                }
            }
        }
    }
    new getNotesTask().execute();
}
```

Chapter 5 Program Development

5.1 The design of the main activity

```
protected void onCreate( Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_create_note);
    ImageView imageBack = findViewById(R.id.imageBack);
    imageBack.setOnClickListener(v -> onBackPressed());
    inputNoteTitle = findViewById(R.id.inputNoteTitle);
    inputNoteSubtitle = findViewById(R.id.inputNoteSubtitle);
    inputNoteText = findViewById(R.id.inputNote);
    textDateTime = findViewById(R.id.textDateTime);
    viewSubtitleIndicator =
findViewById(R.id.viewSubtitleIndicator);
    // adding Image
    imageNote = findViewById(R.id.imageNote);
    // adding URL
```

```
    textWebURL = findViewById(R.id.textWebURL);
    layoutWebURL = findViewById(R.id.layoutWebURL);
    textDateTime.setText(new SimpleDateFormat("EEEE,dd MMMM yyyy
HH:mm a", Locale.getDefault()).format(new Date()));
    ImageView imageSave = findViewById(R.id.imageSave);
    imageSave.setOnClickListener(v -> saveNote());
    selectedNoteColor = "#333333";
    selectedImagePath = "";
    if(getIntent().getBooleanExtra("isViewOrUpdate",false)){
        alreadyAvailableNote =
(Note)getIntent().getSerializableExtra("note");
        setViewOrUpdateNote();
    }
    findViewById(R.id.imageRemoveWebURL).setOnClickListener(v -> {
        textWebURL.setText(null);
        layoutWebURL.setVisibility(View.GONE);
    });
    findViewById(R.id.imageRemoveImage).setOnClickListener(v -> {
        imageNote.setImageBitmap(null);
        imageNote.setVisibility(View.GONE);
findViewById(R.id.imageRemoveImage).setVisibility(View.GONE);
        selectedImagePath = "";
    });
if(getIntent().getBooleanExtra("isFromQuickActions",false)){
        String type = getIntent().getStringExtra("quickActionType");
        if(type !=null){
            if(type.equals("image")){
                selectedImagePath =
getIntent().getStringExtra("imagePath");
imageNote.setImageBitmap(BitmapFactory.decodeFile(selectedImagePath)
);
                imageNote.setVisibility(View.VISIBLE);
findViewById(R.id.imageRemoveImage).setVisibility(View.VISIBLE);
```

```
            }else if(type.equals("URL")){
textWebURL.setText(getIntent().getStringExtra("URL"));
                layoutWebURL.setVisibility(View.VISIBLE);
            }
        }
    }
    initMiscellaneous();
    setSubtitleIndicatorColor();
}
```

5.2 Edit content

```
private void setViewOrUpdateNote(){
    inputNoteTitle.setText(alreadyAvailableNote.getTitle());
 inputNoteSubtitle.setText(alreadyAvailableNote.getSubtitle());
    inputNoteText.setText(alreadyAvailableNote.getNoteText());
    textDateTime.setText(alreadyAvailableNote.getDateTime());
    if(alreadyAvailableNote.getImagePath()!=null &&
!alreadyAvailableNote.getImagePath().trim().isEmpty()){
imageNote.setImageBitmap(BitmapFactory.decodeFile(alreadyAvailableNo
te.getImagePath()));
        imageNote.setVisibility(View.VISIBLE);
findViewById(R.id.imageRemoveImage).setVisibility(View.VISIBLE);
        selectedImagePath = alreadyAvailableNote.getImagePath();
    }
    if(alreadyAvailableNote.getWebLink()!=null &&
!alreadyAvailableNote.getWebLink().trim().isEmpty()){
        textWebURL.setText(alreadyAvailableNote.getWebLink());
        layoutWebURL.setVisibility(View.VISIBLE);
    }
}
```

5.3 Delete note

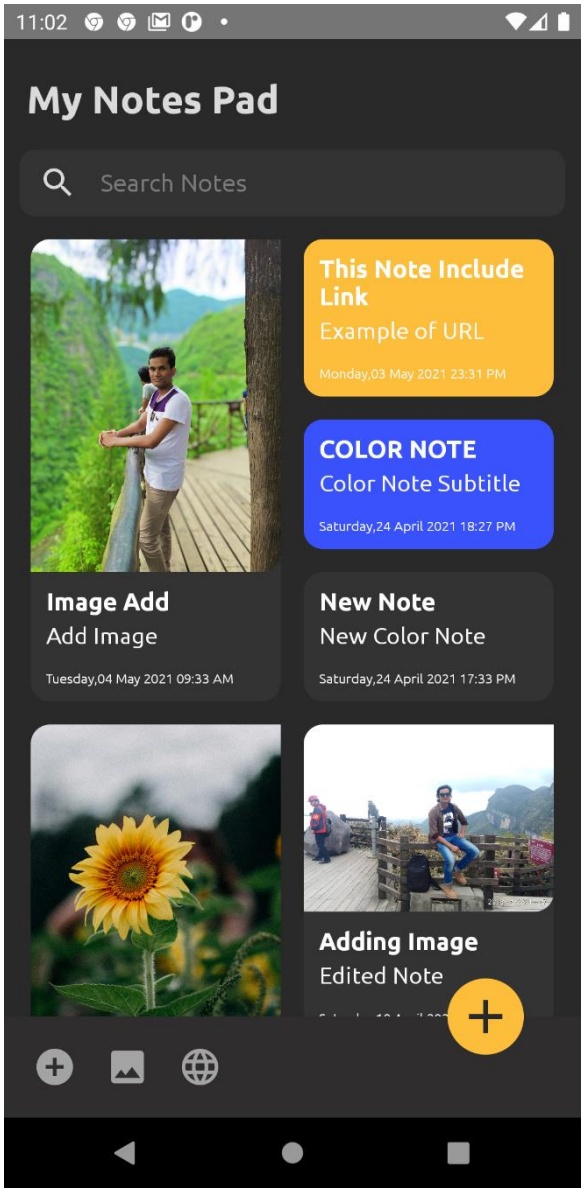
```
private void showDeleteNoteDialog(){
```

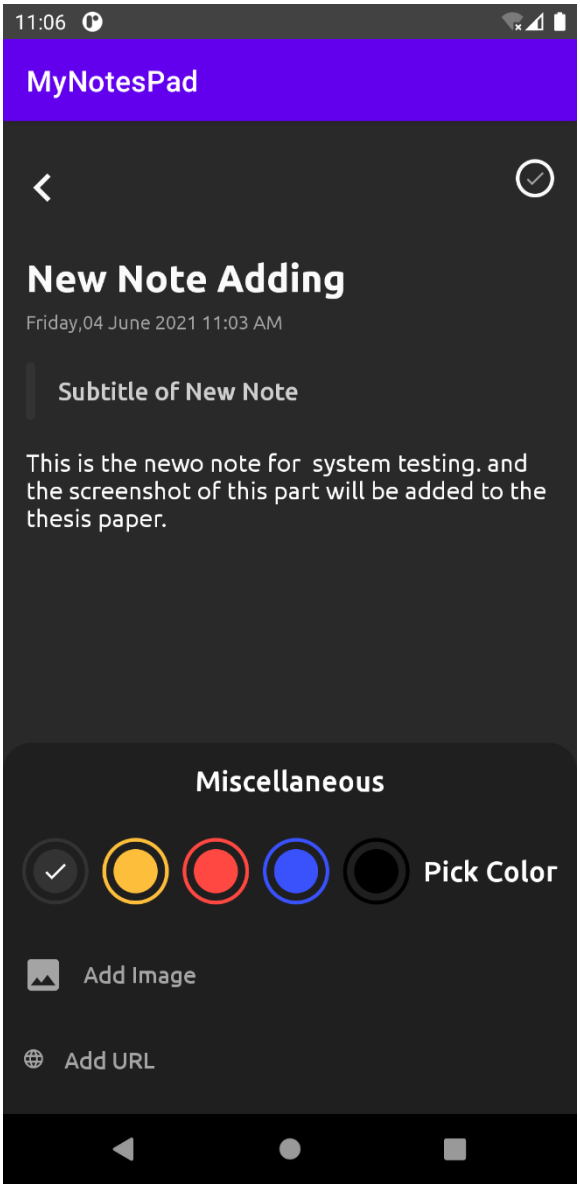
```
    if(dialogDeleteNote == null){
        AlertDialog.Builder builder = new
AlertDialog.Builder(CreateNoteActivity.this);
        View view = LayoutInflater.from(this).inflate(
                R.layout.layout_delete_note,
                (ViewGroup)
findViewById(R.id.layoutDeleteNoteContainer)
        );
        builder.setView(view);
        dialogDeleteNote = builder.create();
        if(dialogDeleteNote.getWindow() !=null){
         dialogDeleteNote.getWindow().setBackgroundDrawable(new
ColorDrawable(0));
        }
view.findViewById(R.id.textDeleteNote).setOnClickListener(new
View.OnClickListener() {
            @Override
            public void onClick(View v) {
                @SuppressLint("StaticFieldLeak")
                class DeleteNoteTask extends AsyncTask<Void, Void,
Void>{
                    @Override
                    protected Void doInBackground(Void... voids) {
NotesDatabase.getDatabase(getApplicationContext()).noteDao().deleteN
ote(alreadyAvailableNote);
                        return null;
                    }
                    @Override
                    protected void onPostExecute(Void aVoid) {
                        super.onPostExecute(aVoid);
                        Intent intent = new Intent();
                        intent.putExtra("isNoteDeleted",true);
                        setResult(RESULT_OK,intent);
```

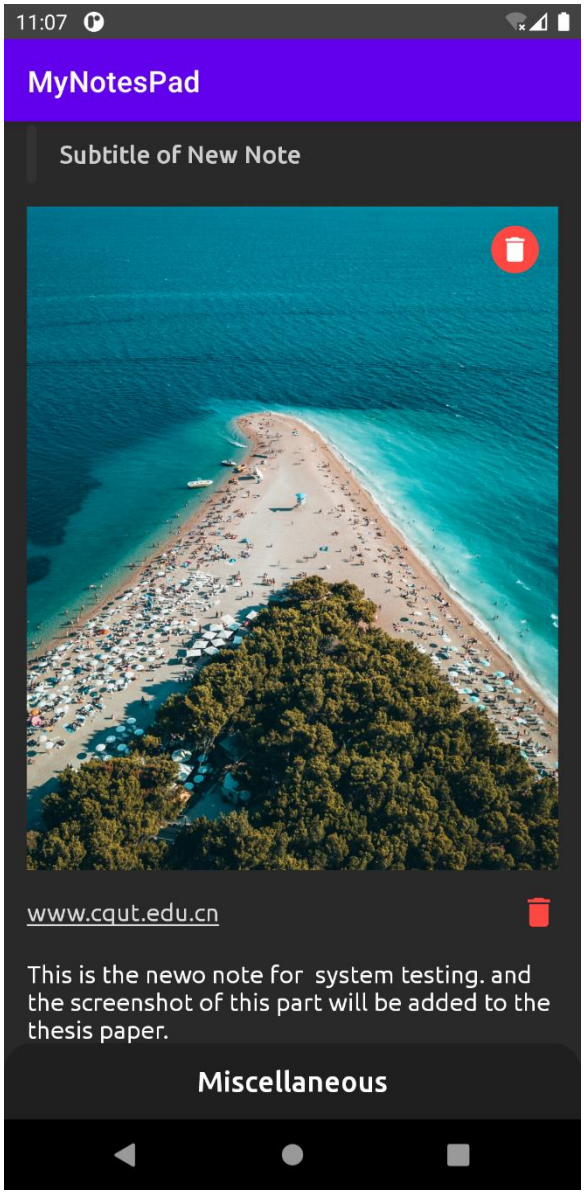
```
                        finish();
                    }
                }
                new DeleteNoteTask().execute();
            }
        });
        view.findViewById(R.id.textCancel).setOnClickListener(v ->
dialogDeleteNote.dismiss());
    }
    dialogDeleteNote.show();
}
```

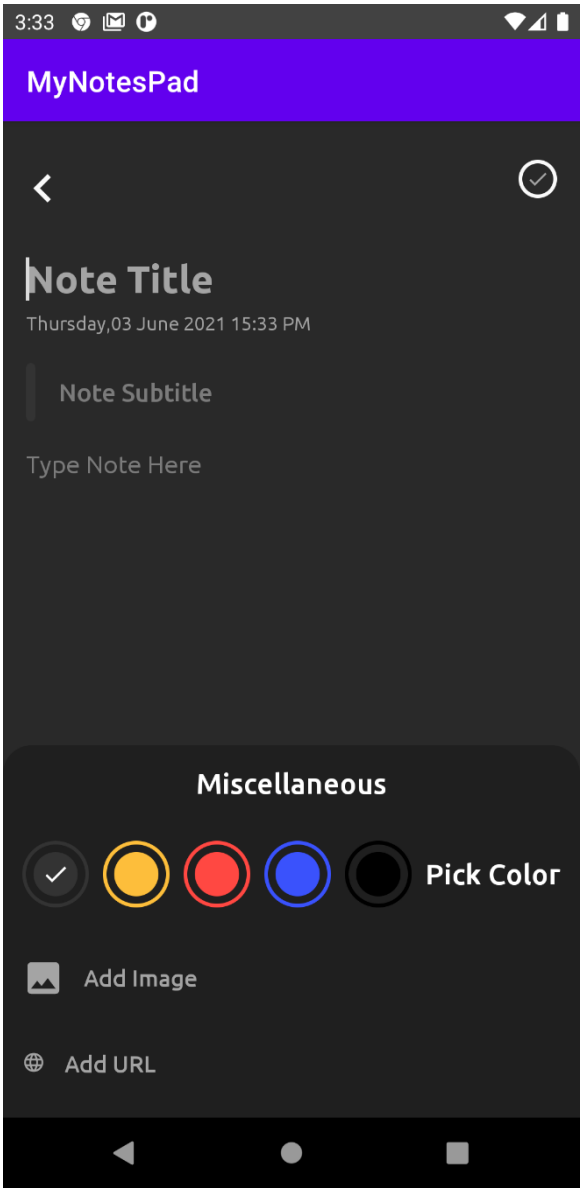
Chapter 6 System Testing

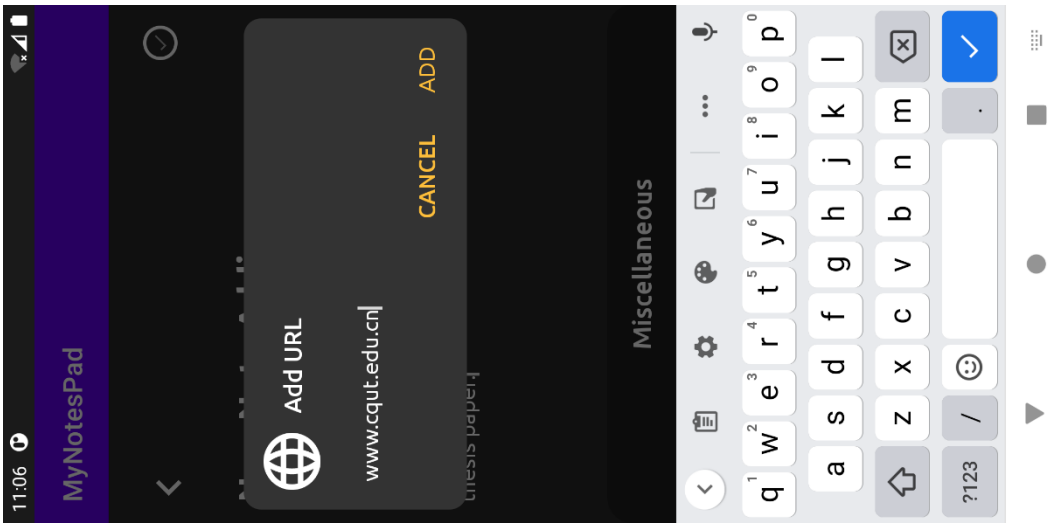
6.1 Add a new note



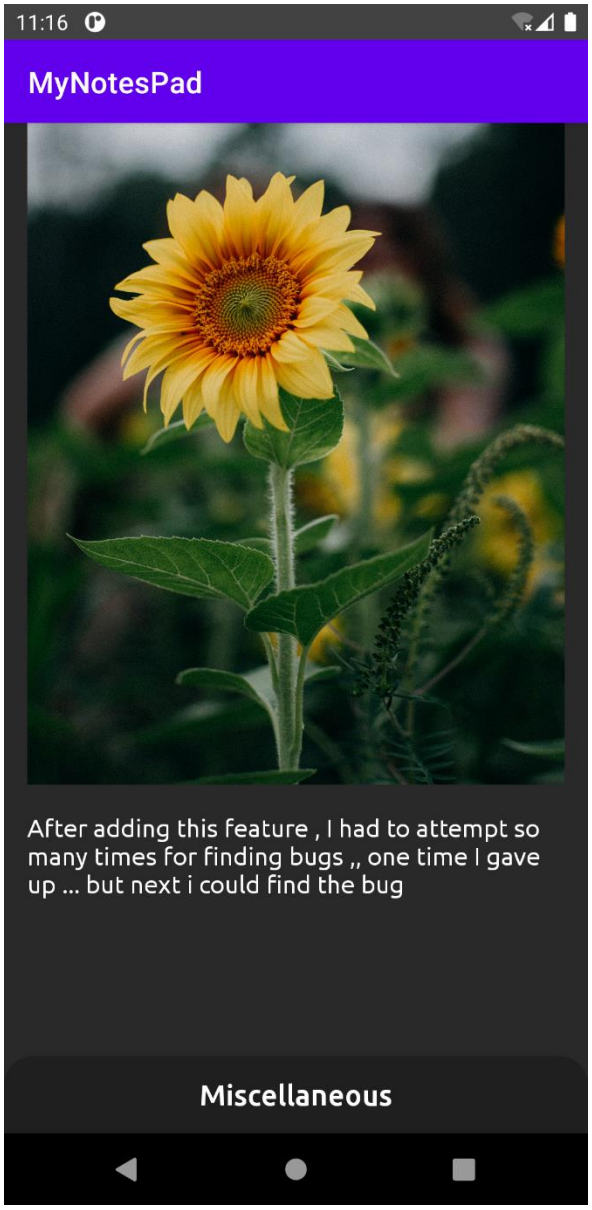


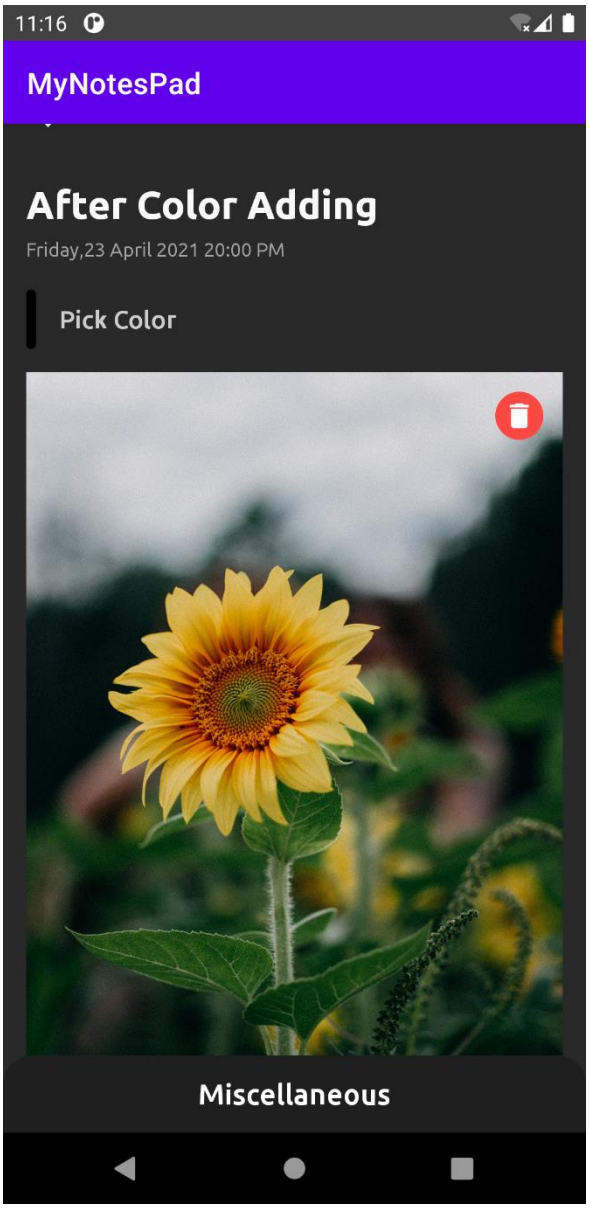

11:07
MyNotesPad
Subtitle of New Note
www.cqut.edu.cn
This is the newo note for system testing. and the screenshot of this part will be added to the thesis paper.
Miscellaneous


3:33
MyNotesPad
Note Title
Thursday,03 June 2021 15:33 PM
Note Subtitle
Type Note Here
Miscellaneous
Pick Color
Add Image
Add URL

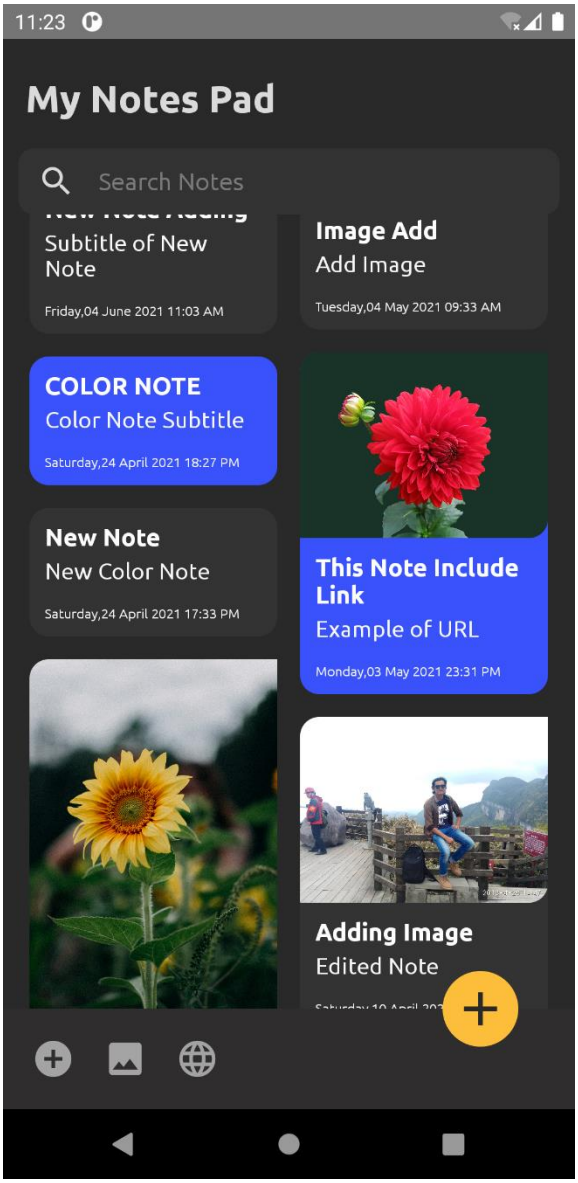

11:06
MyNotesPad
Add URL
www.cqut.edu.cn
CANCEL
ADD
Miscellaneous

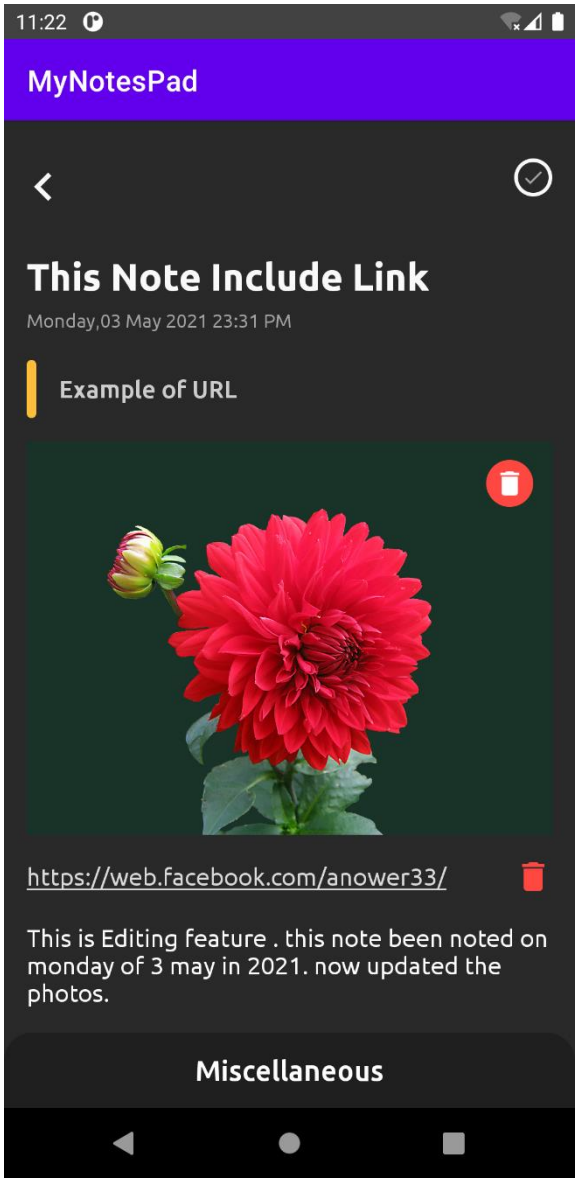
6.2 Viewing notes

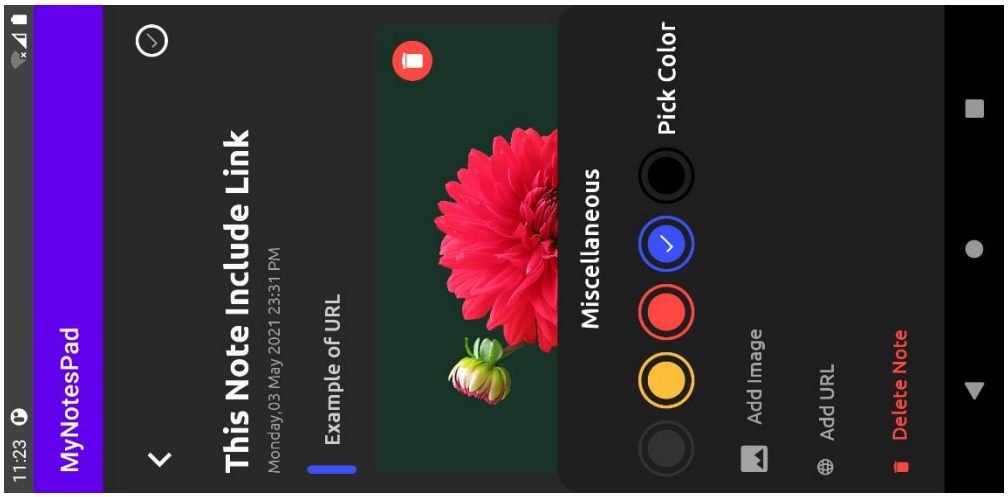




6.3 Delete/modify/delete notes







Chapter 7 Summary

After several months of study, research and development, I finally completed this project on time. Thanks to JAVA, The keen interest aroused my curiosity about Android. From the beginning, I didn't know anything, and I've been groping for it—this software. Through the research and development of this project, I finally realized that theory is still very different from reality. I have exercised the basic knowledge of Android, and I have a great sense of accomplishment in my achievements, which inspired me to great interest in Android research. In this process, I learned a lot of knowledge, such as the Android environment build, Intent, Activity, Service, Content Provider, SQLite, etc., but what I learned. The most crucial point is to use existing resources to solve problems and find answers in libraries and on the Internet. Through this design process, I learned a lot of knowledge. Immediately complete a small project, although many difficulties were encountered in the process, with the help of classmates and teachers.

Through the continuous discovery of problems, summary of issues, and the process of solving problems, I made this graduation project Continuous improvement in the activity and gained valuable experience. Although this software is currently working well, I think the code is not perfect, the conception of the whole project is not enough, and the user interface is not flexible enough. These problems need to be solved one by one in the future. At the same time, this software can be further expanded to enable The function to be more powerful, which brings users a better experience and convenience of life.

Concluding Remarks

After this design, the system has passed the test. Looking back on the course of these six months. From the topic selection to the realization of the system to the completion of the thesis, every step is new to me Try and challenge. In the process of project design, we encountered many difficulties and took many detours. But in the end, through consulting the information, the teacher and the classmates were all resolved. In the design process, after many revisions, the basic principles and methodology in software engineering can be better applied to the specific design of the system. In the project design process, due to technical time and other reasons, there are still many things to be improved. I also hope that the teacher will give us valuable advice here. In order to learn later Continuously improve self-improvement in the study work

References

[1] Yang Fengsheng, "The Secret of Android Application Development", China Machinery Industry Press, September 2008

[2] Deng Fanping, "In-depth understanding of android", Machinery Industry Press, published in August 2010

[3] Ke New Year's Day, "Analysis of Android Kernel", Electronic Industry Press, published September 2006

[4] Wu Yafeng, Suo Yina, etc., "Android Core Technology and Example Detailed Explanation" Electronics Industry Press, 2010-10
publishing

[5] Guo Hongzhi, "Detailed Explanation of Android Application Development", Publishing House of Electronics Industry, published on June 2010

[6] Edited by Jin Yan and Yao Shanglang, "Android Development Introduction and Actual Combat", People's Posts and Telecommunications Press, 2009-07
publishing