

Design Approaches of Android for Students

HyeJa Bang, BaekLin Noh

Dept of Computer Science & Engineering,
Seoul National University of Science and Technology

Abstract

The widespread use of android application is required for students to use in general life. Students need an application that doesn't change the screen a lot for the convenience and need a system that has fewer overloads. In this paper, we have implemented a program that helps students to improve their study using a note of wrong answers, vocabulary game and health management with using balanced diet and stretching.

1. Introduction

Today, the smart phone is no longer the exclusive property of the particular class. It is for men and women of all ages. The top issue of this year was android, instead of Symbian, IOS and other smart phone OS. It is based on JAVA for programmers who are familiar with and flexible coding is possible due to the XMP support to prevent GUI's hard coding and easy maintenance and it helps programmer's convenience with the support of the open source. Professional JAVA programmers and non-professionals who just got interested in Android are entering software development. But many of these applications are not being used properly in device authority and it is still ignored by users due to many unnecessary screen switchings (activity switchings).

In this paper, we implemented an application for students to improve their study.

2. Structure

The application consists of a note of wrong answers, vocabulary game, diet menu, and stretching.

It is not only consisting study function, but also diet menu and stretching. Every each functions can switch into subfunctions and these functions need to be designed proper layout.

2.1 Activity Registration

Activity represents visible interface for users. Basically, it is a screen which runs an application by a user. Application can own more than one Activity and it is possible to send and receive communications between Activities. The four functions of class inherit from Activity,

and subfunctions which related with switching screen also inherit Activity.

After the Activity inheritance, the AndroidManifest.xml file must be registered in related Activity.

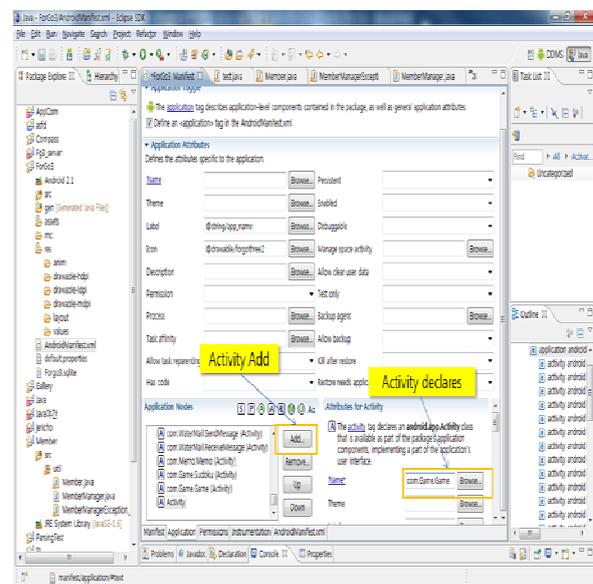


Figure 1 Activity declarations

2.2 Package Structure

If the flow and structure designs are done, then we visualize it with a UML tool.

In this project, we need to classify a note of wrong answer, vocabulary game, diet menu and stretching as packages and we need to decide functions for the classes in the packages.

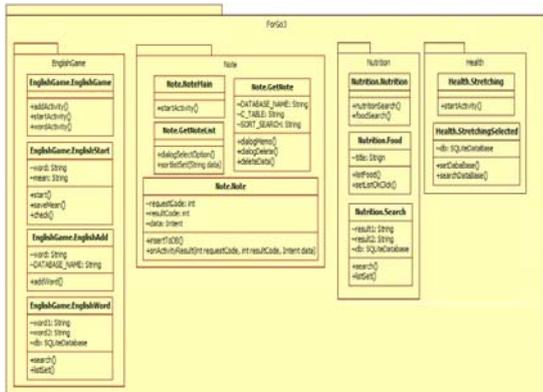


Figure 2 Package structure

3. A note of wrong answer

Instead of handwriting, we used camera that most smart phone supports. Android itself provides call function for camera and gallery. The note saves or calls using the database system.

3.1 Camera & Gallery

Camera and Gallery could be built by users but basically, provided functions are mostly used due to the optimization and performance of. Click the camera button to capture image and click the gallery button to bring the image.



Figure 3 Camera & gallery

If you click the relevant image from the gallery, the screen that shows four radio buttons and text boxes can changes where title and contents can type in. SQLite is mostly used for mobile database. Saved contents recalls and uses in checking part of a note of wrong answer

3.2 Note of wrong answers Check

The saved content titles show on ListView. If each list is clicked, then the screen switches to another page where it can check or delete notes. It's because the contents are important, the contents shouldn't be deleted right away. Before the deletion, rechecking process is needed using a dialog box.

If you click the image, the screen will switch to gallery page, but the difference from previous one is that it selects direct path, not selecting whole gallery. After done switching to relevant image, the contents can be viewed clearly using multi-touch zoom.

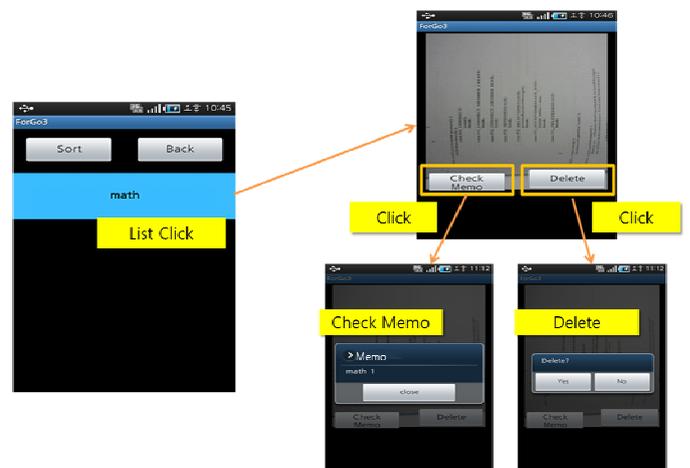


Figure 4 Move to note of wrong answer checking screen

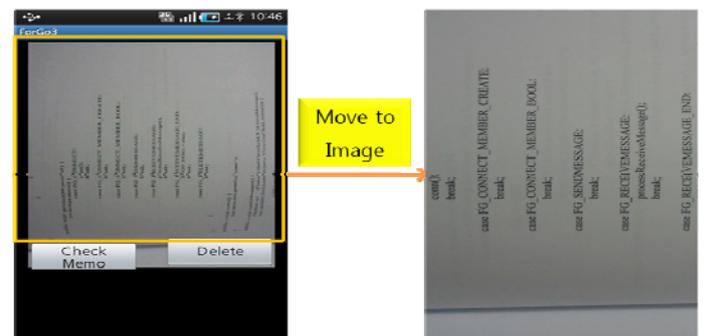


Figure 5 Zoom in after switching to gallery page

To do it, the relevant image URI needs to be stated directly and then move the Activity after adding to Internet.

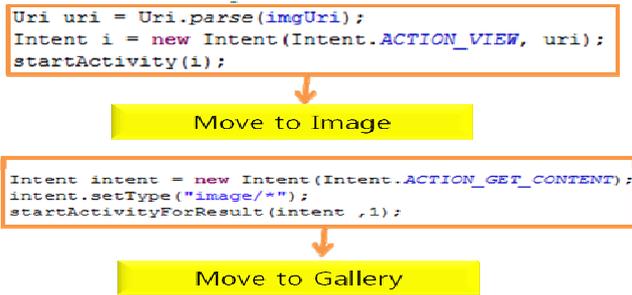


Figure 6 Move to gallery and directly move to image

3.3 Sorting

We need to add sorting function which is better to be sorted than show all of the contents in List for user's convenience.

Changing new screen by clicking related content gives many unnecessary screen movements. It could give users dissatisfaction, so we use a Dialog to resort in the List after choosing related content.



Figure 7 Sort Function

4. Vocabulary game

When vocabulary and the meanings are saved by a user, there are four functions that include saving vocabulary, game, checking and deleting vocabulary to get the correct answer.



Figure 8 Vocabulary game process

4.1 Word saving

When you type in word and meanings, it saves automatically into database. To avoid from filling blank space in database, if there is a blank space in TextEdit, we need to put validation checking logic in and make a pop-up Dialog when Add button is clicked in blank state.

Because unnecessary actions like delete after wrong input are usually ignored by users, it needs validation check to avoid from wrong input so it can provide convenience for users.

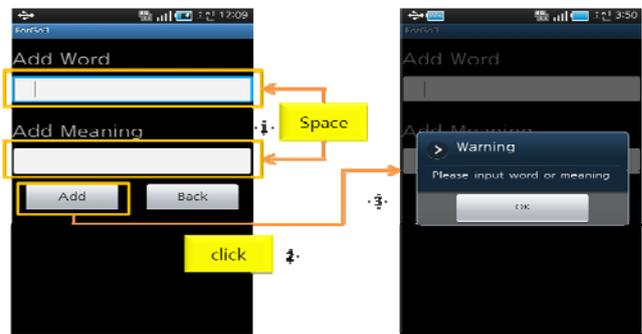


Figure 9 Validation check screen

4.2 Game Start

It is a testing function typed word by user through the game. The screen shows eight words using the random function, but it's possible that same words can come up at the same time, so we need to make logic to avoid.

4.3 Registered word check

We need to check the word or meanings whether they input properly or not by user. And, we need to delete the word, if the word doesn't need any more. All the words and meanings will be displayed on ListView whenever user clicks Search button. And if a user clicks on a delete button then delete dialog will pop-up. And if user clicks yes then it deletes.



Figure 10 Word deletion

5. Diet menu

The main purpose of diet menu is to provide effective menu and calories. Developers need to update diet menu continually to satisfy users, because information is provided by developers, not by users.

5.1 Calorie Check

It is Calorie checking function. Basically, it has more than 100 data in the database. And it needs to be updated. If a user input a word, then it will try to find food that related with the word. We have chosen database query instead. Because, query is more effective than implement in JAVA.

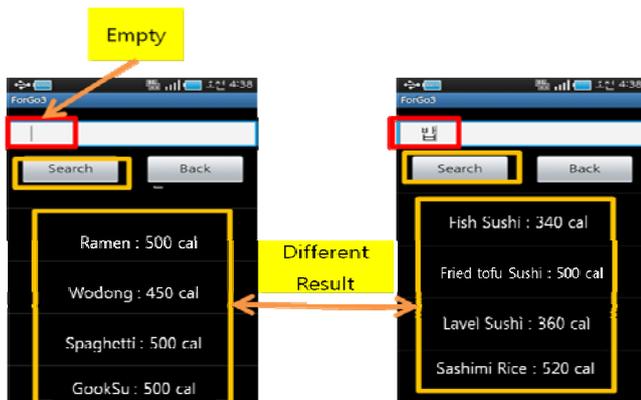


Figure 11 Calorie Search

5.2 Diet Menu Search

This function provides information of diet food with description and photo. This also provides ListView, but this one is little different than default one that provide only one text and uses customized ListView with image and text in the List

First, we need to write CustomView.xml file and CustomView.java file, and then write CustomAdpter.java file that inherits BaseAdapter. Finally, we need to set ListView Adapter at Custom Adapter.

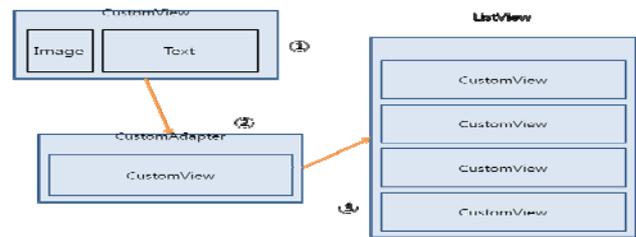


Figure 12-1 Customized ListView



Figure 12-2 Customized ListView

6. Stretching

This function is not only for improving study, but also for health using stretching. There are simple descriptions for stretching with image.

It shows each stretching names on ListView, and if List is clicked then it moves to ImageView where image and TextEdit describes.

Stretching and image file name is stored in the database, and it brings the information from database by clicking. Storing image into database directly isn't a good idea. So we need to store in the same directory where the source file stored in. And we will bring the image name

from the database to match with image and show it on the screen.

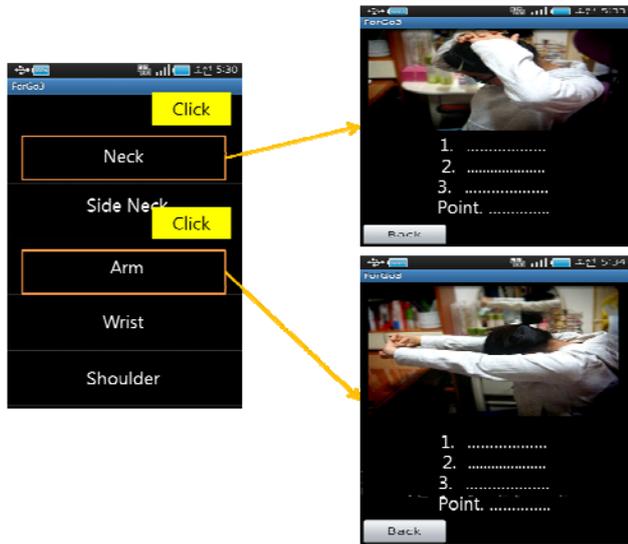


Figure 13 Stretching list

7. Image

Even if an application has a great function, it could be ignored by users, if the layout or image doesn't suit with the application contents. We can use background and component image to change mood for students.

7.1 Background Setting

The default android background color is black, and the color can be changed by developer, so is background or image. Choose Note background image which students are familiar with.

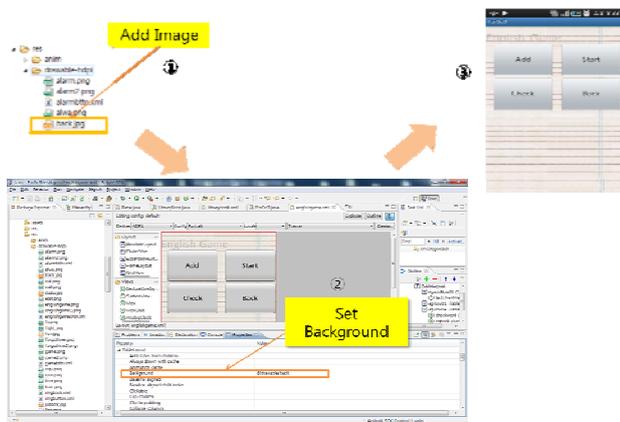


Figure 14 Background image setting

7.2 Image Component Setting

Visible widget component can be set as background image, e.g. Button, TextField. If we want to set clicked and unclicked image, we need to rewrite xml through selector, and then we set xml as background

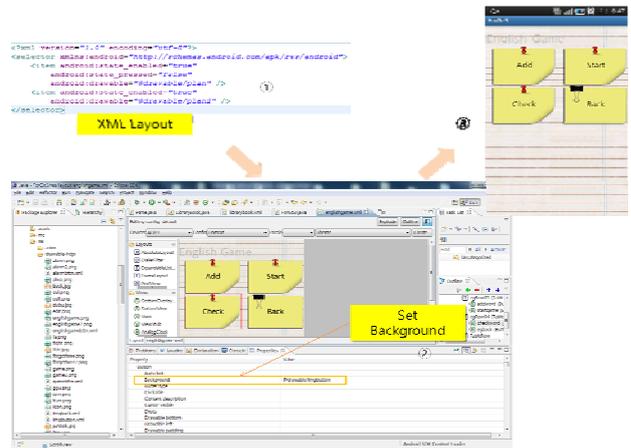


Figure 15 Button image setting

7. Future Work

In this paper, we found out effective implementation by developing 'Android Application for Students'. Until now, android platform isn't perfectly stabilized yet, and it is developing from day to day by updating the version. (The latest version is 'gingerbread 2.3'). So maintenance and updating are must be done continuously to provide effectiveness and high convenient application for developers.

There are many different devices and screen sizes for android. So we need put some effort to make it work as many devices as we can.

The easiest way is that we use ScrollView to overcome the different screen sizes.

And we need to keep update the application to satisfy users, because not every versions work in every devices for android.

References

- [1] Reto Meier, "Professional Android 2 Application Development", WROX PRESS, 2010
- [2] Sayed Hashimi , Satya Komatineni , Dave MacLean "Pro Android 2", Apress, 2009
- [3] Jerome (J. F.) DiMarzio, "Android: A Programmer's Guide", McGraw-Hill, 2008
- [4] Frank Ableson , Charlie Collins, Robi Sen , "Unlocking Android", Manning Publications, 2009
- [5] Wei Meng Lee , "Android Application Development: Create Modify Reuse", WROX PRESS, 2009

- [6] Mark L Murphy , “Android Programming Tutorials, 3rd Edition”, Commonware, 2009
- [7] Mark Murphy , “Beginning Android”, APRESS, 2009



Dr. HyeJa Bang received a bachelor degree at the department of computer science in Soongsil University, 1977 and a master degree in North Texas Univ. Master's degree (Computer Science). She also received a Ph.D in Soongsil University. Currently, she has been worked as a full professor at the department of computer science & engineering in Seoul National University

of Technology and Science.

Interest Field: Programming Language, Formal Languages, Network security, and so on.



BaekLin Noh Dept. of Computer Science & engineering, Seoul National University of Science and Technology
Interest Field: JAVA, Android