Android Project– Lessons Learned

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Lessons learned from Android Project

Tips to deal with the multi-resolution in Android

As we all know, there are many different resolutions in Android. When we build the application, we need to take care of the most popular resolutions.

I learned 2 tips to deal with it. First, in a reasonable range, make your layout is suitable for all the resolutions. For example, we can use relative layout and weight parameter to create a xml designed for all the smart phones. Second, for another range, create another layout file. For example, create another layout file for all the tablets.

Learn how to use the Asynchronous Task

Using the asynchronous task we can deal with the background thread and UI update easily. There are three main functions to overwrite: doInBackground, doProgressUpdate and onPostExecute.

Using the fragment to make it reusable.

Using the fragment we can easily deal with different layout on different devices while reuse the majority of the codes.

How to use the fragment

1. Create the layout.xml for the fragment.
2. Create the class extending from the Fragment.
3. In the OnCreateView, try to build the layout of the fragment
4. In the layout of the activity, create the fragment tag.
5. In the activity, use the FragmentManager to get the fragment.

How to analyze the data and design the model

This is the most important thing I learned in this lab because this lessons is not restricted in java. We can use this tip in all the object-oriented programming.

When we want to create a project. First we should analyze data carefully and try to build some model classes. Second, we should define the class relationships for model classes. Then we should recheck the detailed design of model classes, in which we should consider how to populate data into this models. After that, we should create some helper classes (for example, FileUtils or DBUtils) based on our requirements.

This is the core idea of the MVC pattern. Because in this project we don't have GUI, we only designed based on Model and Controller. The key point is to separate them and then connect them based on interface.

Use package to organize your classes.

The java package is designed to restrict the class control and avoid the name conflict. When we program, first we should put all the classes with similar motivation into a same package, to make the project has a clean structure. Second, we should use package to protect the privacy of some classes. For example, only the classes in the same package can visit some specific class.

The benefit of using java interface

In my opinion, there are two advantages when you use the interface. First is about the reusability. When you need to implement the same methods in the future, it is better to use the interface. Second, the interface can be treated as connection between two models, especially when you want to design APIs (like what we did in the project). We can use the several interfaces in one object, making it has many features. When we want to use one feature, we can convert it to that interface. In this way we can also hide some information in that object.

This is the lessons I learned from the project.

Use exception handler to fix incorrect situation

If we use the exception handler, we can separate the core code from the exception code. In this way we can achieve one principle that I learned before: try to do only one thing in every method or class.

The other things I learned

There are also some tricks or small items I learned, so I just list them as bellow.

1. Using the adapter in the listview to show the data
2. The four main principles of OOPS language is inheritance, polymorphism, data encapsulation and abstraction.
3. The lifecycle of Activity is very important, which contains the status of active, paused, stopped and inactive.
4. The Android use activity stack to deal with the switch of the different activities.
5. The method onMeasure deals with how much space the child need to occupy.
6. The method onDraw deals with how to draw the widget on the screen.
7. In the Paint, there are many powerful tools to use, such as maskFilter, colorFilter and so on.
8. “JDK” is the Java Development Kit, we can use it to write java code. “JRE” is the Java Runtime Environment, we can use it to run the java software.
9. onDraw is very expensive, try to do as less thing as you can.
10. Dp,dpi,sp,dip are different unit in android. It’s better to use the dip and sp.
11. We can use intent to start activity or service as well as start the boardcast.
12. PendingIntent gives us the chance to create Intents that can be fired on your application's behalf by another application.
13. String is immutable while StringBuffer and StringBuilder are not. The difference between StringBuilder and StringBuffer is that StringBuffer is synchronized while StringBuilder is not.
14. ArrayList is backed by array in Java that provides random search, while LinkedList is the collection of nodes that has sequence, and efficient to insert or erase in the middle.
15. The wait and notify methods are used for thread communication. The wait is used to pause the thread, and the notify is used to send signal to waiting threads.
16. In java, almost all the value are object-based and the no-preemptive value are passed by reference.
17. The abstract class is utilized to provide some common implementation while leave some methods for child class. The interface is usually used as API to expose.
18. The stream in java is very convenient to use and easy to learn.
19. The FileInputStream is used to read binary data while the FileReader is used to read text data.
20. We cannot override static method in Java because they are settled at compile time, not runtime.
21. We can send explicit data from GET method(which shows in the URL) while implicit data from POST.
22. As I have learned, “Java servlet is server side technologies to extend the capability of web servers by providing support for dynamic response and data persistence”.
23. As has shown in the slides, “interface provides access to web application parameters to the servlet. The ServletContext is unique object and available to all the servlets in the web application”.
24. “PrintWriter is a character-stream class. We can use PrintWriter to write character based information such as character array and String to the response whereas we can use ServletOutputStream to write byte array data to the response”.

25. Don’t forget to add the permissions in the AndroidManifest.xml
26. In java, all the local variable are not static.
27. In object, all the equal function is compared by reference except for the string, because the string has override the equal function.
28. The interface of cloneable is only a flag interface，inside it there is no substantial content.
29. If the class has the “final” modifier, it cannot be extended.
30. When the super class has the constructor with parameter, the system won’t generate the default constructor automatically.
31. Use the URLConnection to get the inputstream of the bitmap online.
32. Finalize() method is utilized to free the allocated resource.
33. Use the bufferedReader to read the file on the SD card.
34. “Exceptions are abnormal conditions that arise during execution of the program. It may occur due to wrong user input or wrong logic written by programmer”.
35. The error is mostly a system issue. It always occur at run time. The exception is usually an input data issue or wrong logic in code.
36. The finally block is a block of code that always executes, no matter whether an exception is thrown
37. There are two ways to create a thread in Java. First is to implement runnable interface. The second is to extend Thread class.
38. For the sleep method, it causes the current thread to suspend execution for a specified period. For the wait method, It causes current thread to wait until either another thread invokes the notify() method or the notifyAll() method for this object.
39. If we would like to make an object serializable, we just need to implement the interface Serializable.
40. In the mainthread there is a looper, in which there exists the message queue.
41. JDBC API has 3 Interfaces and their key features of these are as follows: Statement, Prepared Statement, Callable Statement.
42. We can use the startActivityForResult to wait the result for the future activity.