ITIS/ITCS 4180/5180 Mobile Application Development
In Class Assignment 4

Basic Instructions:

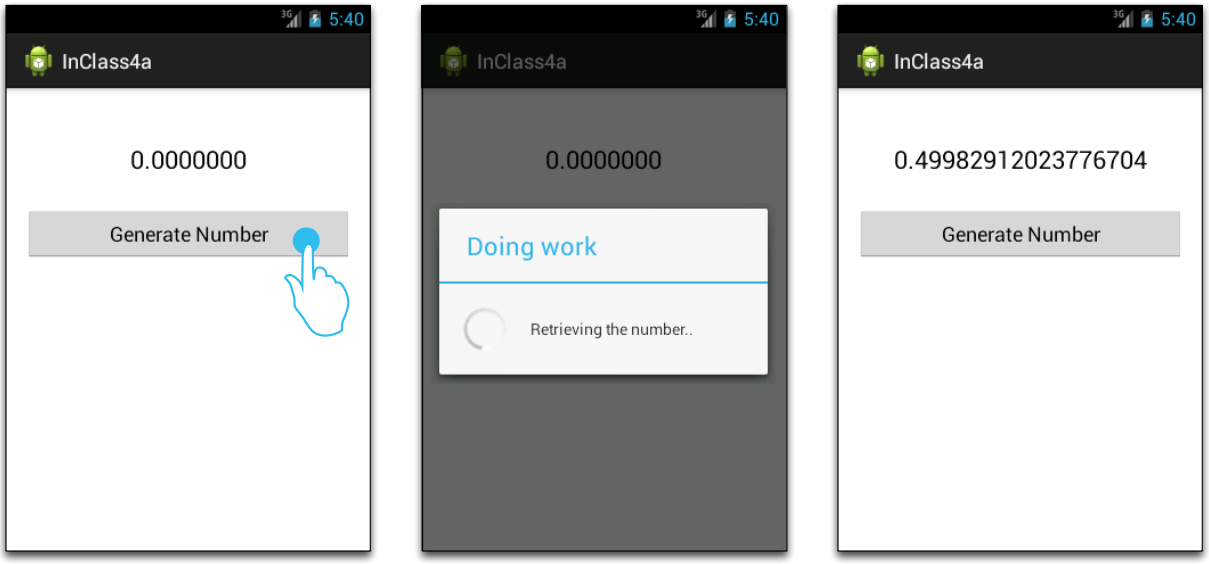
1. In every file submitted you MUST place the following comments:
   a. Assignment #.
   b. File Name.
   c. Full name of all students in your group.
2. Each group should submit only one assignment. Only the group leader is supposed to submit the assignment on behalf of all the other group members.
3. Please download the support files provided with this assignment and use them when implementing your project.
4. Export your Android project as follows:
   a. From eclipse, choose *"Export…"* from the File menu.
   b. From the Export window, choose *General* then *File System*. Click *Next*.
   c. Make sure that your Android project for this assignment is selected. Make sure that all of its subfolders are also selected.
   d. Choose the location you want to save the exported project directory to. For example, your *Desktop* or *Documents* folder.
   e. When exporting make sure you select *Create directory structure for files*.
   f. Click Finish, and then go to the directory you exported the project to. Make sure the exported directory contains all necessary files, such as the .java and resource files.
5. Submission details:
   a. When you submit the assignment, compress your exported Android project into a single zip file. The format of compressed file name is InClassAssignment#.zip
   b. You should submit the assignment through Moodle: Submit the zip file.
6. **Failure to follow the above instructions will result in point deductions.**

In Class Assignment 4 (100 Points)

In this assignment you will build your first Android application. You will get familiar with simple multithreading and UI manipulation.

Notes:

1. The recommended Android Virtual Device (AVD) should have minimum SDK version set to 11 and target SDK at least 17. The app should display correctly on 3.2" QVGA (ADP2) (320x480: mdpi).



(a) Launching screen (b) ProgressDialog (c) Generated Number Updated

Figure 1, Application User Interface (Part 1)

Part 1 (70 Points): Using AsyncTasks

The interface should be created to match the user interface (UI) presented in Figure 1. You will be using layout files, and strings.xml to create the user interface. Perform the following tasks:

1. Create a new android project called "In Class 4a".
2. You are provided with a HeavyWork class that contains a method getNumber(). This method takes a long time to execute. Your task is to use an AsyncTask to execute this method in a background thread. The method returns a number which should be displayed in the TextView in the layout. Do not use the main thread to generate the number. The UI should be manipulated by the only main thread.
3. Tapping on the "Generate Number" button should start the execution of a background thread the computes the number using the getNumber() method in the HeavyWork class. While the number is being generated display a ProgressDialog indicating that the number is being generated, see Figure1(b).
4. The ProgressDialog should not be cancelable. The ProgressDialog should be dismissed after the number is generated and displayed in the TextView, see Figure 1(c).

Part 2 (30 Points): Using Threads and Handlers

This part is similar to Part 1, but you should use threads and handlers to implement the same functionality provided by Part 1. Perform the following tasks:

1. Create a new android project called “In Class 4b”.
2. You are provided with a HeavyWork class that contains a method getNumber(). This method takes a long time to execute. Your task is to use a background thread to execute this method. The method returns a number which should be displayed in the TextView in the layout. Do not use the main thread to generate the number. The UI should be manipulated by the only main thread.
3. Tapping on the “Generate Number” button should start the execution of a background thread the computes the number using the getNumber() method in the HeavyWork class. While the number is being generated display a ProgressDialog indicating that the number is being generated, see Figure1(b).
4. The ProgressDialog should not be cancelable. The ProgressDialog should be dismissed after the number is generated and displayed in the TextView, see Figure 1(c).
5. To be able to exchange messages between the child thread and the main thread use the Handler class. Either use messaging or setup a runnable message.