

CS478: Software Development for Mobile Platforms

Project #3

Due time: 9:00 pm on 11/2/2018

Total points: 100

Instructor: Ugo Buy

TAs: HoangMinh HuynhNguyen and Dhananjay Gupta

For this project you will design and code three new Android apps meant to work together on an Android phone running Nougat 7.1. Here is a short summary of the apps:

1. Application A_1 defines a new dangerous-level permission called “*edu.uic.cs478.f18.project3*” and sends one of two kinds of broadcasts. Both broadcasts use implicit intents. The other two applications will receive the broadcasts; however, these applications will receive the broadcasts only if the sender (i.e., A_1) has that permission. App A_1 specifically defines an activity containing two read-only text views and two buttons. The buttons, when selected, will broadcast two different intents with actions concerning points of interest in the cities of San Francisco, CA and New York, NY, depending on the button pressed. The text views describe the meaning of the buttons to the device user. Both broadcasts are *ordered broadcasts*. Moreover, both broadcasts require that a receiver have acquired permission “*edu.uic.cs478.f18.project3*” in order to respond to the broadcast. App A_1 must also acquire this permission before sending the broadcasts.
2. Application A_2 receives the intents sent by A_1 ; A_2 contains a single activity that defines a welcome message and a button. When the button is pressed, the activity checks whether the permission has been acquired “*edu.uic.cs478.f18.project3*”. If not, it requests the permission. App A_2 also define **two** broadcast receivers **programmatically**, one for each of the two broadcasts by A_1 . Whenever a broadcast intent is received, A_2 displays a toast message on the device’s display. The toast message indicates whether the broadcast sender was selecting San Francisco or New York. However, A_2 ’s broadcast receiver is designed in such a way that it will only respond to a broadcast if the broadcast sender has permission “*edu.uic.cs478.f18.project3*”.
3. Application A_3 also receives A_1 ’s broadcasts if the sender has permission “*edu.uic.cs478.f18.project3*”. Depending on the intent received, A_3 will launch one of two activities. The first activity displays information about at least 6 points of interest in San Francisco. The second activity should show points of interest in New York; however, you are not responsible for coding this activity. Just display a toast message indicating the New York information is under construction. A_3 defines also a single broadcast receiver **statically**; this receiver must respond to both kinds of intents sent by A_1 .

The San Francisco activity consists of two fragments, whose behavior is described below. Finally, application A_3 maintains an *action bar*. The action bar shows the name of the application and an icon associated with the application (your choice).

The San Francisco activity in A_3 contains two fragments. The first fragment displays a list of points of interest for the city. The device user may select any point from the list; the currently selected item is highlighted. The second fragment shows the official web page of the selected item.

When the device is in portrait mode, the two fragments are displayed on different screens. First, the device will show only the first fragment. When the user selects an item, the the first fragment disappears and the second fragment is shown. Pressing the “back” soft button on the device, will return the device to the original configuration (first fragment only), thereby allowing the user to select a different point of interest. When the device is in landscape mode, application A_3 initially shows only the first fragment across the entire width of the screen. As soon as a user selects an item, the first fragment is “shrunk” to about 1/3 of the screen’s

width. This fragment will appear in the left-hand side of the screen, with the second fragment taking up the remaining 2/3 of the display on the right. Again, pressing the “back” button will return the application to its initial configuration. The action bar should be displayed at all times regardless of whether the device is in portrait or landscape mode.

Finally, the state of application A_3 should be retained across device rotations, e.g., when the device is switched from landscape to portrait configuration and vice versa. This means that the selected list item (in the first fragment) and the page displayed in the second fragment will be kept during configuration changes.

As for the order of execution of A_2 and A_3 ’s receivers, you should configure these apps in such a way that a receiver in A_2 is *always* executed before the receiver in A_3 , after A_1 sends a broadcast.

Implementation notes. For this project use a Pixel 2 device running a new Android platform (API 25—Nougat). (You’ll have to download SDK tools for API level 25 and to create an AVD running 7.1 in the Studio IDE.) You are not required to provide backward compatibility with previous Android versions. Use method *setRetainInstance()* to prevent fragments from getting deleted when a configuration change occurs, resulting in the destruction of the containing activity. Check out the app *Fragments Static Config Layout* from Adam Porter’s Coursera course to see how to work fragment retention in A_3 .

You must work alone on this project. Submit the three Studio projects as a zip archive using the submission link in the assignment’s page on Blackboard. No late submissions will be accepted.