Android Project – Wi-Fi Scanner
ACO430 Wireless Network
Due: April 18, 2019
Note: This is a group project of group size 2-3.

Project description:
In this project, you are going to experience Android development. You are asked to implement an Android application called Wi-Fi Scanner which can display a list of Wi-Fi networks in range and connect to the Wi-Fi of user's choice (extra credit).

The Android classes which handle the Wi-Fi related operations are included in package android.net.wifi. Study the classes in this package and figure out how to scan the network, get the scan result, and connect to an open or WPA/WPA2 secured network.

User Interface: The application has three elements in the user interface: a welcome text, a scan button, and an ap list. When the application is launched, the welcome text area shows "WifiScanner", and the scan button should be enabled to let user to choose to start the scan. When the scan is in process, the welcome text area should show "Scan in progress" and scan button and ap list are both disabled. After the scan finishes, the welcome text shows the number of discovered BSSes. The scan button is enabled and the ap list shows discovered BSSes information, including SSID, BSSID, security capability, frequency, signal level.

Extra credit (10 points): Allow the user to choose any discovered Wi-Fi from the ap list and connect to the network.

Implementation and deployment:
1. Use attached MainActivity.java file as a guideline of the code structure and what needs to be implemented.
2. Design the corresponding widgets in activity_main.xml
3. Add a new resource file to define the layout of the TextView for ListView Adapter
4. Modify the AndroidManifest.xml file to add permission ACCESS_WIFI_STATE and CHANGE_WIFI_STATE for your application.
5. Use Log.d() to print out status/debugging messages to help with debugging.
6. Set the application as debuggable in build.gradle (Module: app) file
7. Set the Android device to be debuggable and might need to install driver for the device. Make sure the minSDK is lower or equal to your Android device API
8. Android Studio (version 3.1.4) has been installed in the ACO Lab. You are strongly recommended to install the Android development environment on your own computer too.
9. Do it step by step and test every step before move on to the next step

Useful resource:
1. Android Studio installation
https://developer.android.com/studio/index.html

2. Android tutorials
https://developer.android.com/training/index.html

3. Android API reference
https://developer.android.com/reference/packages.html

4. Wifi Package in Android API
http://developer.android.com/reference/android/net/wifi/package-summary.html

5. Debugging with Log
https://developer.android.com/studio/debug/am-logcat.html

6. Deploy on Android device
https://developer.android.com/studio/run/oem-usb.html
https://developer.android.com/studio/run/device.html

7. ListView
https://developer.android.com/guide/topics/ui/layout/listview.html
https://developer.android.com/guide/topics/ui/declaring-layout.html#AdapterViews

Submission:

1. Hardcopy of the java files and the xml files, electronic submission of the zip of your project directory.
2. Screenshot of your application on Android device. Include before scan, in the middle of scan, and after scan screenshot.