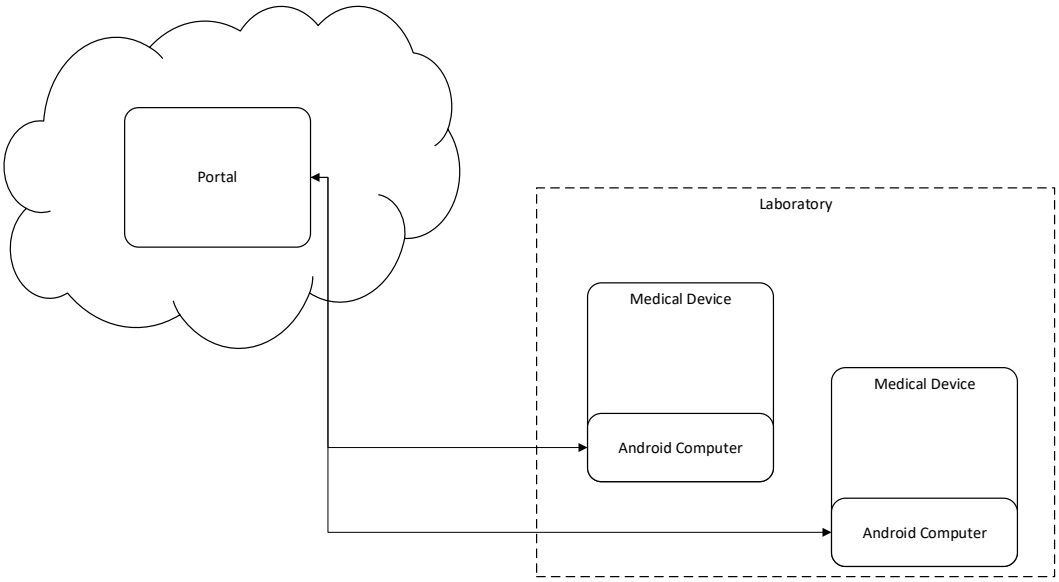
Android SW Engineer Mini-Project

Background

You are working on a medical device project which contains an Android touchscreen computer. Each device is connected to a cloud portal, and a testing laboratory can have many of these devices deployed. This is shown in the diagram below:



Each day, at a predefined time, the Android computer contacts the portal via an API and downloads a list of allowed users for the device. It then uses this information to update its local list of allowed users. Note: the update list may not provide information for every user of the device (i.e. some users may be local to the device).

Project Brief

You are asked to write the code that takes the information received from the portal and updates the status of each local user. To do this you are provided with a text data file `PortalUserList.txt` that simulates the data returned by the API call to the portal. The file structure is a tab delimited file with each row containing:

1. User ID – represented by a UUID
2. Device ID – an unsigned integer representing the ID of the medical device
3. User Status – a byte (in hex, where bits are zero-indexed) representing the status of the user on that instrument:
   a. Bit 7 – Authorisation Status (1 = Authorised to access device, 0 = Disabled)
   b. Bit 6 – User's Training Status (1 = Trained on device, 0 = Training is out of date)
   c. Bit 5 – Admin Status (1 = User is an Operator, 0 = User is an Administrator)

The portal only provides any changes to the existing users, and any users not present in the list must retain their current status. The file `DeviceUserList.txt` simulates the current status of users on the device and is a tab delimited file with each row containing:

1. User ID – represented by a UUID

2. Device ID – an unsigned integer representing the ID of this particular device
3. User Status – a byte (in hex, where bits are zero-indexed) representing the status of the user on that instrument:
    a. Bit 7 – Authorisation Status (1 = Authorised to access device, 0 = Disabled)
    b. Bit 6 – User's Training Status (1 = Trained on device, 0 = Training is out of date)
    c. Bit 5 – Admin Status (1 = User is an Operator, 0 = User is an Administrator)

Write a method that uses the 2 files provided to generate a new tab delimited file called `DeviceUserListUpdated.txt` that contains the updated status of all users with the following structure:

1. User ID – represented by a UUID
2. Device ID – an unsigned integer representing the ID of this particular device
3. User Authorisation Status on the device
    – `[AuthorisedAdmin, AuthorisedOperator, DisabledAdmin, DisabledOperator]`
4. User Training Status on the Device
    – `[Trained, Untrained]`

An example outline class is shown below:

```
public class DeviceUserManager {

    // your code here

    public void updateUsers() {
        // your code here
    }
}
```

Note: the signature/interface to any of the above code is not fixed and you *are* allowed to change it.

Deliverables

1. Source code including instructions on how to build and run
2. `DeviceUserListUpdated.txt` output file

Optional Deliverable

1. Only if you have time develop a design document for a simple Android app that allows users to select a user and see their current status from the `DeviceUserListUpdated.txt` output file

Additional Notes

- Document any assumptions that you make to complete this task
- You do not need to use any particular IDE or compiler
- This mini-project is the property of Osler Diagnostics and you are not permitted to share it without written consent.