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Git Repository: https://github.com/Security-System-Company/COSC-310-Project

FEATURES ADDED

- Connection (network) between android studio and processing
- Make databases
- Redesign UI for android studio: switching from access levels to rooms
- Fire emergency procedure

OPEN-SOURCE LIBRARIES USED:

262588213843476, "TCP Echo Client," *Gist*. [Online]. Available: https://gist.github.com/HeptaDecane/dedc27e210ebd7e58c10eb38d6c26081#file-echoclient-java. [Accessed: 14-Nov-2022].

262588213843476, "TCP ECHO server java," *Gist*. [Online]. Available: https://gist.github.com/HeptaDecane/5b39bd01b03ff8fb9c44c7ebf65d9728#file-echoserver-java. [Accessed: 14-Nov-2022].

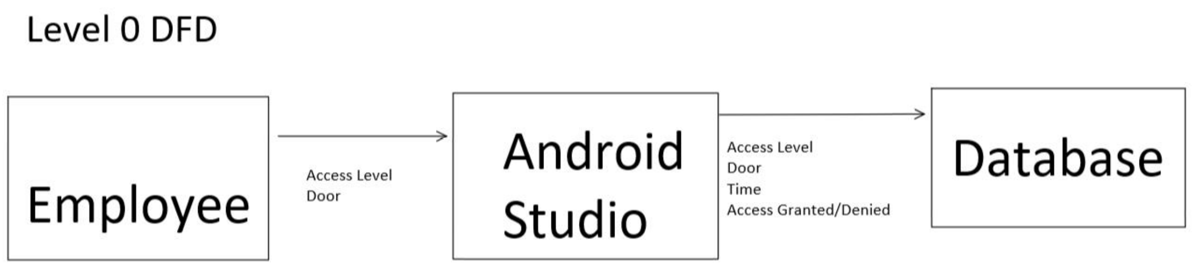
"Android.nfc : android developers," *Android Developers*. [Online]. Available: https://developer.android.com/reference/android/nfc/package-summary. [Accessed: 14-Nov-2022].

"Color : Android developers," *Android Developers*. [Online]. Available: https://developer.android.com/reference/android/graphics/Color. [Accessed: 14-Nov-2022].

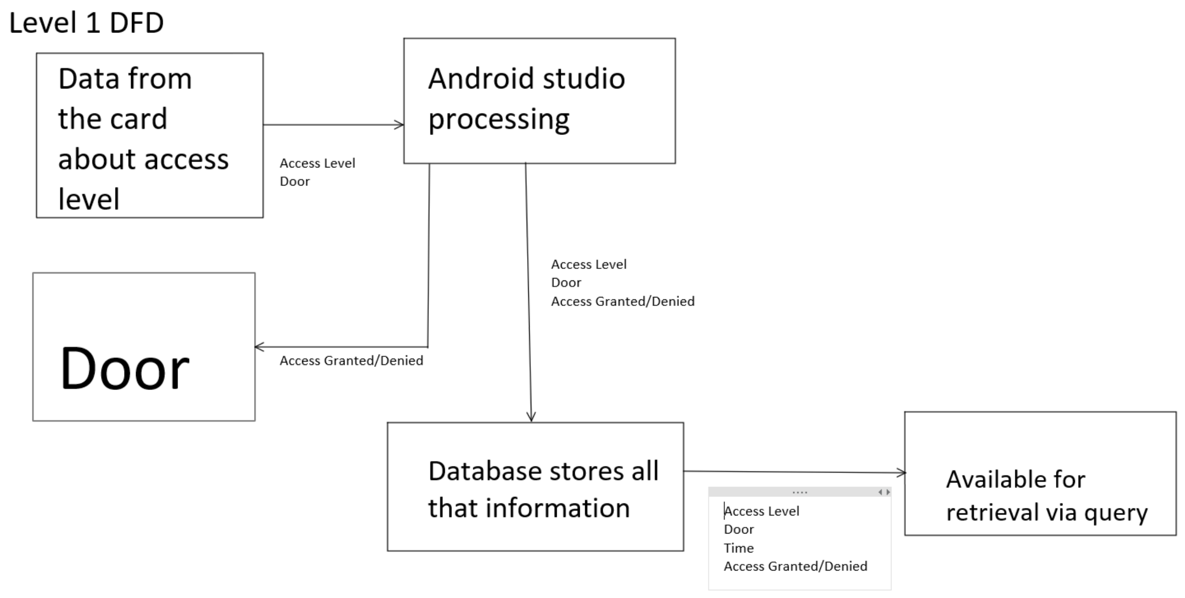
CSVWriter (opencsv 5.7.0 API), 04-Sep-2022. [Online]. Available: https://opencsv.sourceforge.net/apidocs/com/opencsv/CSVWriter.html. [Accessed: 14-Nov-2022].

"FileWriter (Java Platform SE 7)," *FileWriter (Java Platform SE 7)*, 24-Jun-2020. [Online]. Available: https://docs.oracle.com/javase/7/docs/api/java/io/FileWriter.html. [Accessed: 14-Nov-2022].

"Socket (Java Platform SE 7)," *Socket (java platform SE 7)*, 24-Jun-2020. [Online]. Available: https://docs.oracle.com/javase/7/docs/api/java/net/Socket.html. [Accessed: 14-Nov-2022].

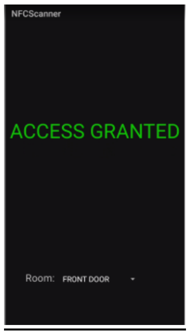


This diagram represents the level 0 data flow diagram. Very simply it shows that three variables are sent from the employee to the android studio app. Which then processes those variables and sends them as well as another two variables to be stored in a database.

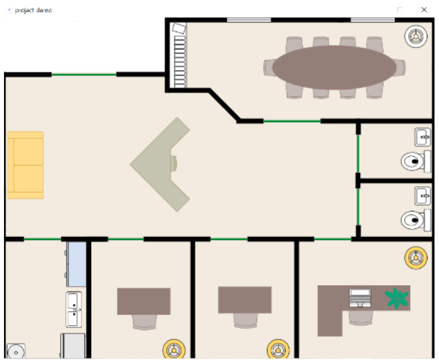

Level 1 DFD
Data from the card about access level
Access Level
Door
Android studio processing
Access Level
Door
Access Granted/Denied
Door
Access Granted/Denied
Database stores all that information
Access Level
Door
Time
Access Granted/Denied
Available for retrieval via query

This diagram shows the data flow from the next level perspective. Here we see that the data starts off with the employee, goes to Android Studio where two more variables are added. This information can either be sent to the physical door for information on opening or remining closed. Or the information gets sent to the database. It is also an option to query through the database to search for information regarding door activity.

<u>OUPUT</u>

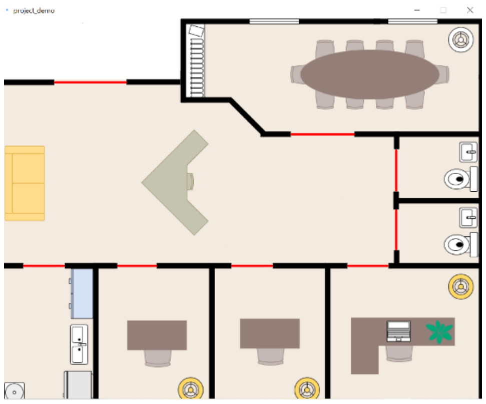


This image occurs when an NFC card with the right access level is tapped against the scanner, the room indicates what door is attempting to be opened.

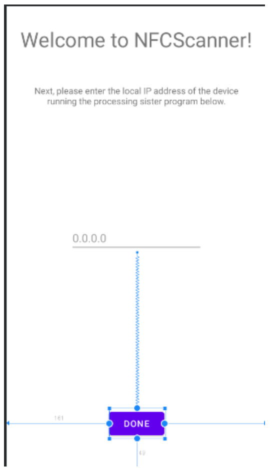


This image represents a visualization of the office when a fire happens, the emergency measures are implemented, and all doors are set to open.

The first issue occurs after an emergency is over, there is a small delay where all doors are set to red as shown below:



The other issue occurs when an IP address is put in on the screen below, any form of wrong input causes the app to crash


Welcome to NFCScanner!

Next, please enter the local IP address of the device running the processing sister program below.

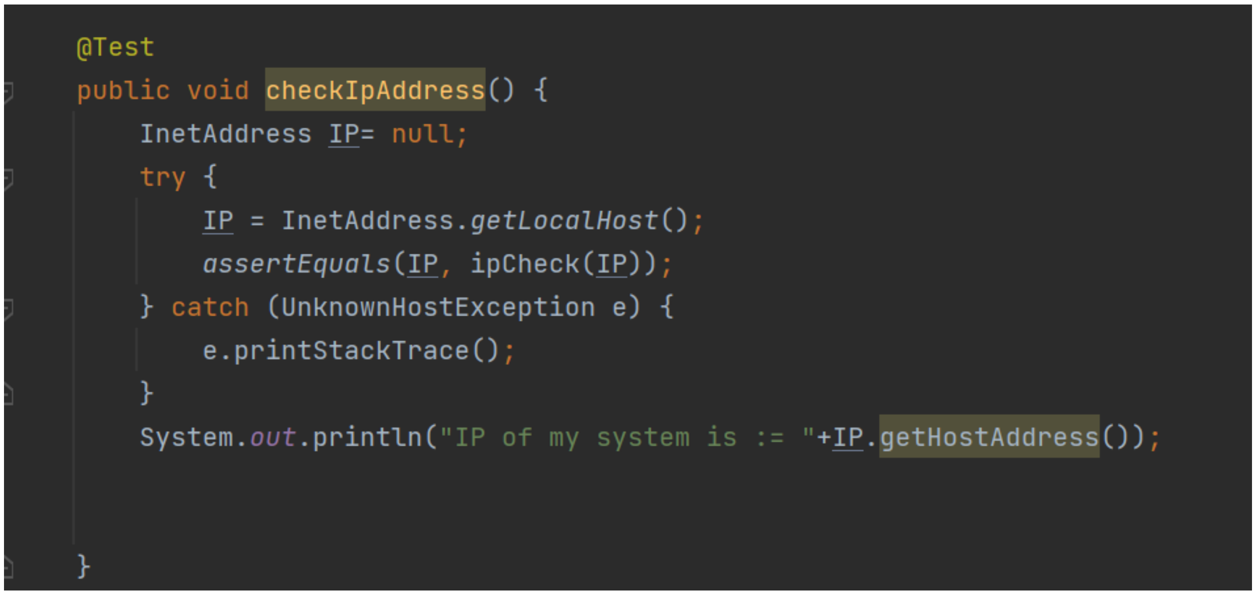
LIMITATIONS

- Resetting from emergency procedures simply requires scanning a regular NFC card, needs to be more secure
- Server attempts to connect with the port infinite times despite only needing to do it once
- Scanner will not wait for a prompt before taking in next scan attempt
- If a door is not numbered there is no code in place to catch the error and act as a failsafe
    - The same can be said for a situation where something other than a Boolean is passed in the place of a Boolean

5 FEATURES

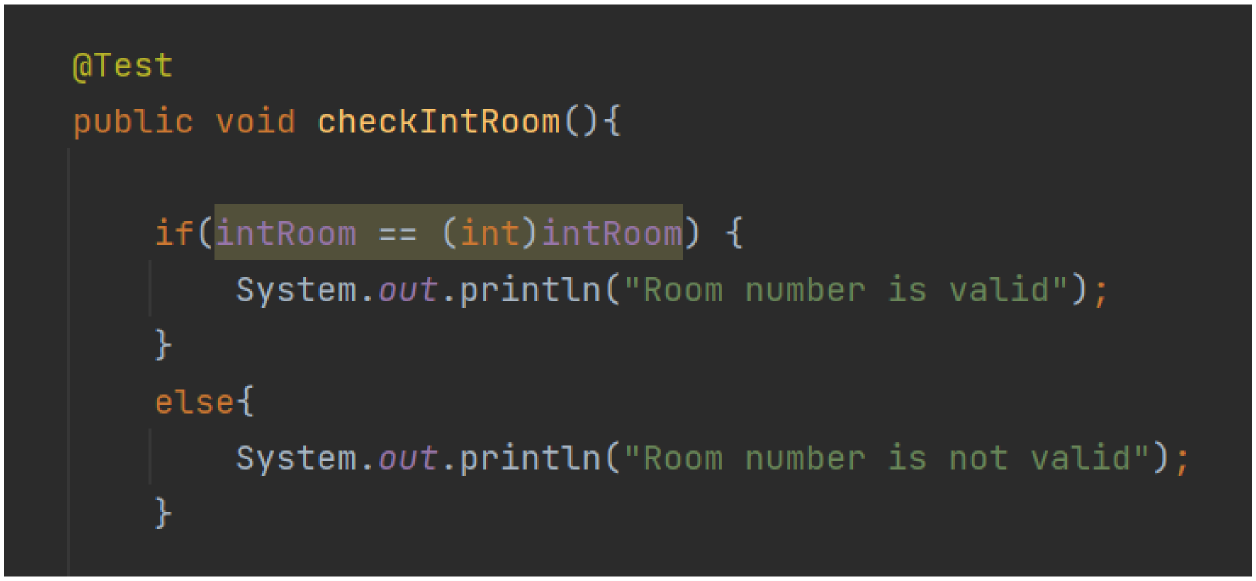
1. Exporting information from Android Studio to processing. Here, using Java Sockets, we can send information in the form of strings to Processing. This allows us to store that information to a locally saved database using Processing.
2. Writing information to an excel spreadsheet and editing the same excel spreadsheet to add on new data and not rewrite.
3. included emergency features for fires or intruders that will have special behavior such that all doors either remain open or closed respectively, and an appropriate message is displayed to the user on the NFCScanner app.
4. Having special behavior for emergencies and allowing the system to emulate what would happen should one of these emergencies occur is an important improvement to our system as it then gains the ability to handle exceptional circumstances and alter the systems behavior accordingly, outside of its default state of regular use. A virtual demonstration of how the employees would be provided access to rooms and how doors would open and close.

UNIT TESTING

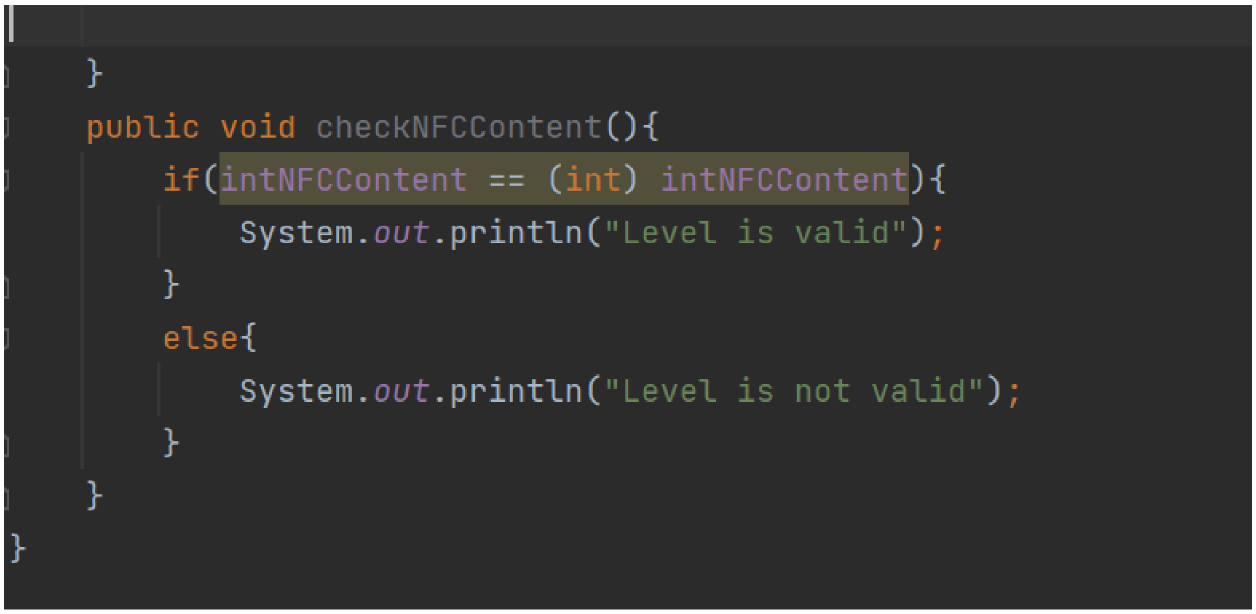


```
@Test
public void checkIpAddress() {
    InetAddress IP= null;
    try {
        IP = InetAddress.getLocalHost();
        assertEquals(IP, ipCheck(IP));
    } catch (UnknownHostException e) {
        e.printStackTrace();
    }
    System.out.println("IP of my system is := "+IP.getHostAddress());


}
```

This unit test method using JUnit in android studio checks to see whether the ip address inputted by the user is a valid ip address. This is necessary for the program to run correctly.



```
@Test
public void checkIntRoom(){

    if(intRoom == (int)intRoom) {
        System.out.println("Room number is valid");
    }
    else{
        System.out.println("Room number is not valid");
    }
```



```
    }
    public void checkNFCContent(){
        if(intNFCContent == (int) intNFCContent){
            System.out.println("Level is valid");
        }
        else{
            System.out.println("Level is not valid");
        }
    }
}
```