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Certification Page

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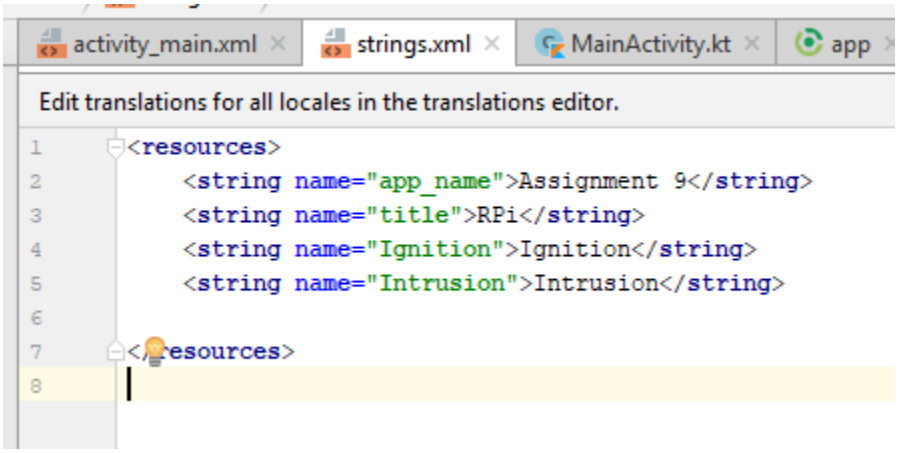
1) Reconfiguring Android display layout




```
<?xml version="1.0" encoding="utf-8"?>
<!-- SwipeRefreshLayout is the main layout which is used to enable pull-down refresh -
->
<android.support.v4.widget.SwipeRefreshLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/swipeLayout"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context="edu.utexas.firstproject.MainActivity">

    <android.support.constraint.ConstraintLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent">

        <TextView
            android:id="@+id/title"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_marginEnd="8dp"
            android:layout_marginStart="8dp"
            android:layout_marginTop="36dp"
            android:fontFamily="sans-serif"
            android:text="@string/title"
            android:textColor="@android:color/background_dark"
            android:textSize="36sp"
            android:textStyle="bold"
            app:layout_constraintEnd_toEndOf="parent"
            app:layout_constraintStart_toStartOf="parent"
            app:layout_constraintTop_toTopOf="parent"
            />

        <TableLayout
            android:layout_width="0dp"
            android:layout_height="0dp"
            android:layout_marginStart="8dp"
            android:layout_marginEnd="8dp"
            android:layout_marginBottom="8dp"
```

```
android:layout_marginTop="128dp"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintBottom_toBottomOf="parent">


<TableRow>

    <TextView
        android:id="@+id/txtSwitch"
        android:layout_width="114dp"
        android:layout_height="42dp"
        android:fontFamily="sans-serif"
        android:text="@string/Ignition"
        android:textColor="@android:color/black"
        android:textSize="30sp"
        android:textStyle="bold" />

    <TextView
        android:id="@+id/txtSwitch2"
        android:layout_width="246dp"
        android:layout_height="42dp"
        android:fontFamily="sans-serif"
        android:text="@string/Intrusion"
        android:textAlignment="viewEnd"
        android:textColor="@android:color/black"
        android:textSize="30sp"
        android:textStyle="bold" />
</TableRow>

<TableRow
    android:layout_width="match_parent"
    android:layout_height="match_parent">

    <android.support.v7.widget.SwitchCompat
        android:id="@+id/switchLed2"
        android:layout_width="wrap_content"
        android:layout_height="match_parent"
        android:fontFamily="sans-serif"
        android:textSize="30sp"
        android:textStyle="bold"
        android:theme="@style/SwitchCompatStyle"
        tools:checked="true" />

    <TextView
        android:id="@+id/ledSwitchText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:fontFamily="sans-serif"
        android:textAlignment="textEnd"
        android:textColor="@android:color/background_dark"
        android:textSize="30sp"
        android:textStyle="bold" />

    <android.support.v7.widget.SwitchCompat
        android:id="@+id/switchLed"
        android:layout_width="wrap_content"
        android:layout_height="match_parent"
        android:fontFamily="sans-serif"
        android:textAlignment="textEnd"
        android:textSize="30sp"
```

```
                    android:textStyle="bold"
                    android:theme="@style/SwitchCompatStyle"
                    tools:checked="true" />

            </TableRow>
        </TableLayout>


    </android.support.constraint.ConstraintLayout>
</android.support.v4.widget.SwipeRefreshLayout>
```

---

build.gradle

```
apply plugin: 'com.android.application'

apply plugin: 'kotlin-android'

apply plugin: 'kotlin-android-extensions'

android {
    compileSdkVersion 28
    defaultConfig {
        applicationId "edu.utexas.firstproject"
        minSdkVersion 19
        targetSdkVersion 28
        versionCode 1
        versionName "1.0"
        testInstrumentationRunner "android.support.test.runner.AndroidJUnitRunner"
    }
    buildTypes {
        release {
            minifyEnabled false
            proguardFiles getDefaultProguardFile('proguard-android.txt'), 'proguard-
rules.pro'
        }
    }
}

dependencies {
    implementation fileTree(dir: 'libs', include: ['*.jar'])
    implementation"org.jetbrains.kotlin:kotlin-stdlib-jdk7:$kotlin_version"
    implementation 'com.android.support:appcompat-v7:28.0.0-alpha1'
    implementation 'com.android.support.constraint:constraint-layout:1.1.3'
    testImplementation 'junit:junit:4.12'
    androidTestImplementation 'com.android.support.test:runner:1.0.2'
    androidTestImplementation 'com.android.support.test.espresso:espresso-core:3.0.2'
}
```

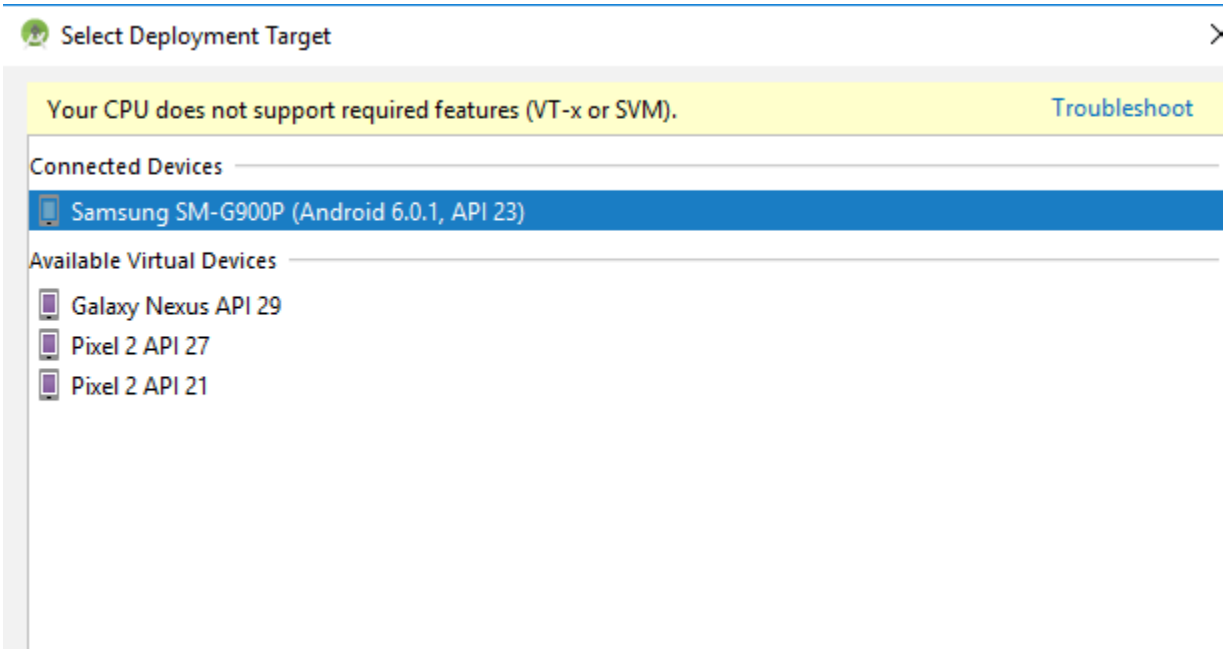
2) Kotlin code: MainActivity.kt

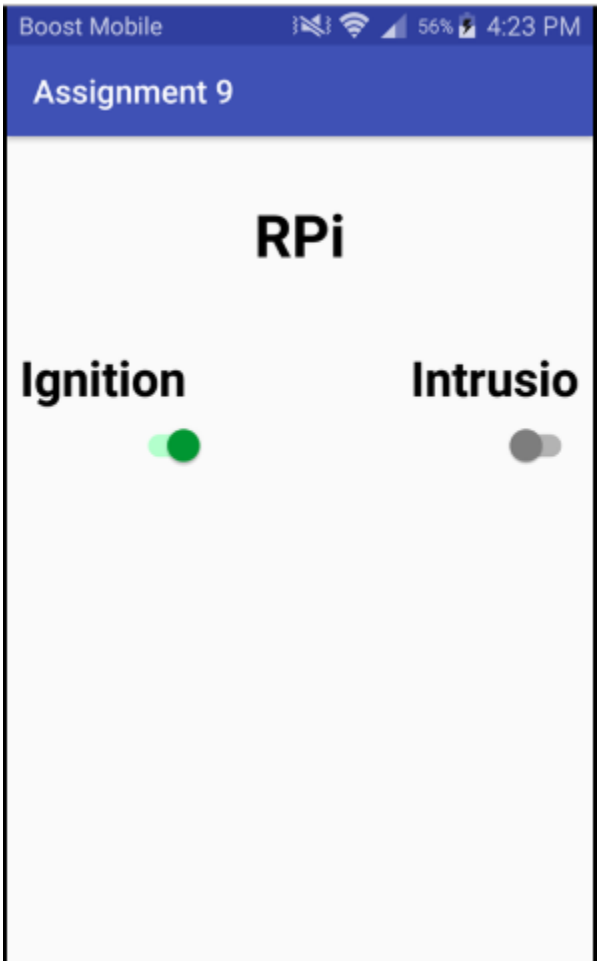
3)
```
package edu.utexas.firstproject

import android.support.v7.app.AppCompatActivity
import android.os.Bundle
```

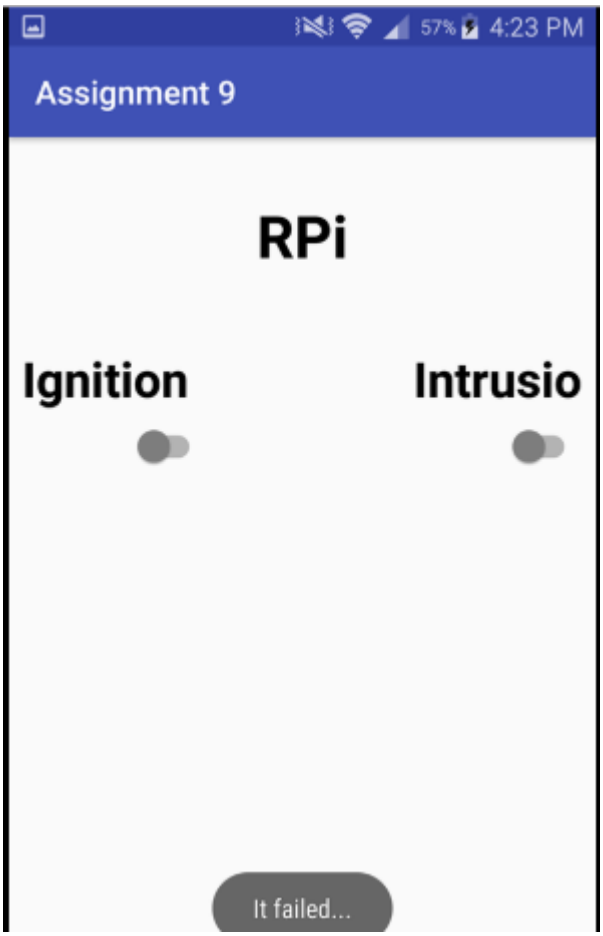
```
import android.support.v4.widget.SwipeRefreshLayout
import android.support.v7.widget.SwitchCompat
import android.widget.CompoundButton
import android.widget.Toast
import com.android.volley.Request
import com.android.volley.Response
import com.android.volley.toolbox.JsonObjectRequest
import com.android.volley.toolbox.Volley
import kotlinx.android.synthetic.main.activity_main.*
import org.json.JSONObject
class MainActivity : AppCompatActivity(),
        SwipeRefreshLayout.OnRefreshListener {

    private lateinit var ignitionSwitch: SwitchCompat
    private lateinit var intrusionSwitch: SwitchCompat
    private lateinit var swipeRefresh: SwipeRefreshLayout
    private var refreshSwitch: Boolean = true
    private val username: String = "ben"
    private val password: String = "benpass"


    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
        ignitionSwitch = switchLed2 as SwitchCompat
        intrusionSwitch = switchLed as SwitchCompat
        swipeRefresh = swipeLayout as SwipeRefreshLayout
        swipeRefresh.setOnRefreshListener(this)

        intrusionSwitch.isClickable = false

        ignitionSwitch.setOnCheckedChangeListener { _: CompoundButton,
                                                    checked: Boolean ->
            if (refreshSwitch) update()
        }
        update()
    }
    override fun onRefresh() {
        update()
        swipeRefresh.isRefreshing = false
    }
    private fun update() {
        // Get status of SW1 and LED1
        val SW1_status = if (intrusionSwitch.isChecked) 1 else 0
        val LED1_status = if (ignitionSwitch.isChecked) 1 else 0
        val url = "https://www.map3.hostingerapp.com/scripts/sync_app_data.php"
        val jsonObject = JSONObject().apply {
            put("username", username)
            put("password", password)
            put("SW1", SW1_status)
            put("LED1", LED1_status)
        }
        val jsonObjectRequest = JsonObjectRequest(Request.Method.POST, url,
                jsonObject,
                Response.Listener {
                    val success = it.get("success")
                    if (success == 1) {
                        // Set the statuses to the ones received
                        refreshSwitch = false
                        intrusionSwitch.isChecked = (it.get("SW1") == 1)
                        ignitionSwitch.isChecked = (it.get("LED1") == 1)
                        refreshSwitch = true
                        Toast.makeText(this, "It succeeded!",
```

```
                                Toast.LENGTH_LONG).show()
                        } else {
                            Toast.makeText(this, "It failed...",
                                    Toast.LENGTH_LONG).show()
                        }
                    },
                    Response.ErrorListener {
                        Toast.makeText(this, it.message,
                                Toast.LENGTH_LONG).show()
                    })
            Volley.newRequestQueue(this).add(jsonObjectRequest)
        }
    }
```

3) Emulating a phone:



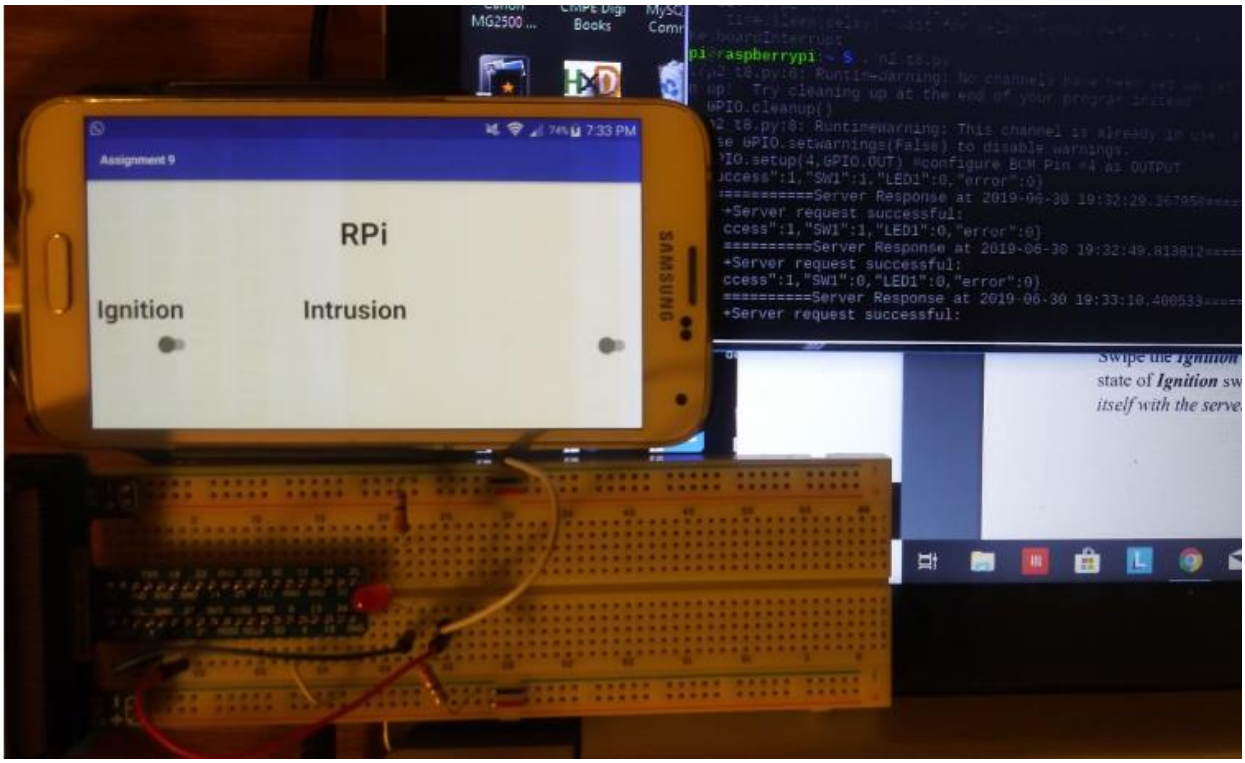

Boost Mobile
56%
4:23 PM
Assignment 9
RPi
Ignition
Intrusio

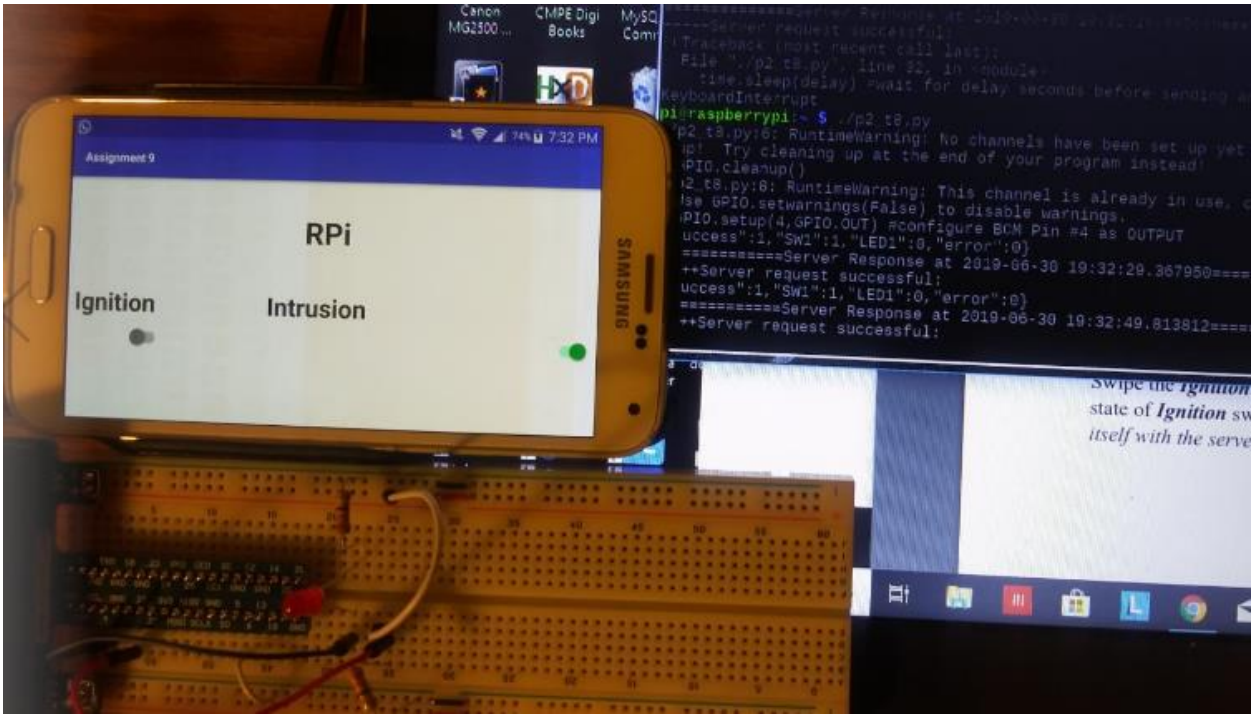

57%
4:23 PM
Assignment 9
RPi
Ignition
Intrusio
It failed...

4) Demo - Interaction with RPi: R

Set Sw1 = 0 and to 1on RPI

```
pi@raspberrypi:~ $ ./p2_t8.py
./p2_t8.py:6: RuntimeWarning: No channels have been set up yet - nothing to clea
n up!  Try cleaning up at the end of your program instead!
  GPIO.cleanup()
./p2_t8.py:8: RuntimeWarning: This channel is already in use, continuing anyway
  Use GPIO.setwarnings(False) to disable warnings.
  GPIO.setup(4,GPIO.OUT) #configure BCM Pin #4 as OUTPUT
{"success":1,"SW1":1,"LED1":0,"error":0}
==============Server Response at 2019-06-30 19:32:29.367950==============
+++++Server request successful:
{"success":1,"SW1":1,"LED1":0,"error":0}
==============Server Response at 2019-06-30 19:32:49.813812==============
+++++Server request successful:
{"success":1,"SW1":0,"LED1":0,"error":0}
==============Server Response at 2019-06-30 19:33:10.400533==============
+++++Server request successful:
{"success":1,"SW1":0,"LED1":0,"error":0}
==============Server Response at 2019-06-30 19:33:30.884443==============
+++++Server request successful:
```



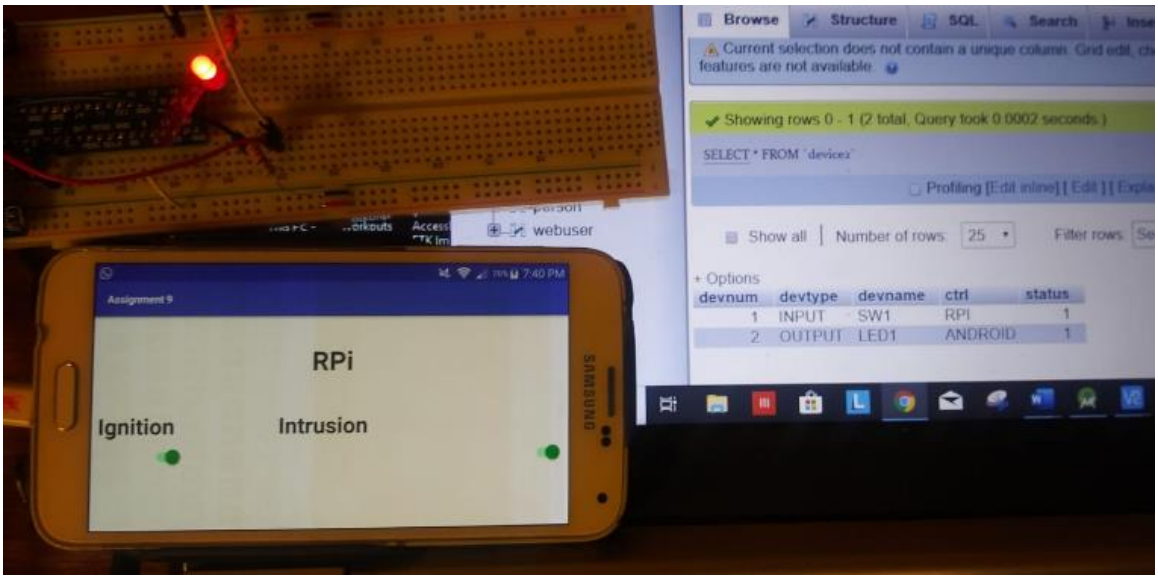


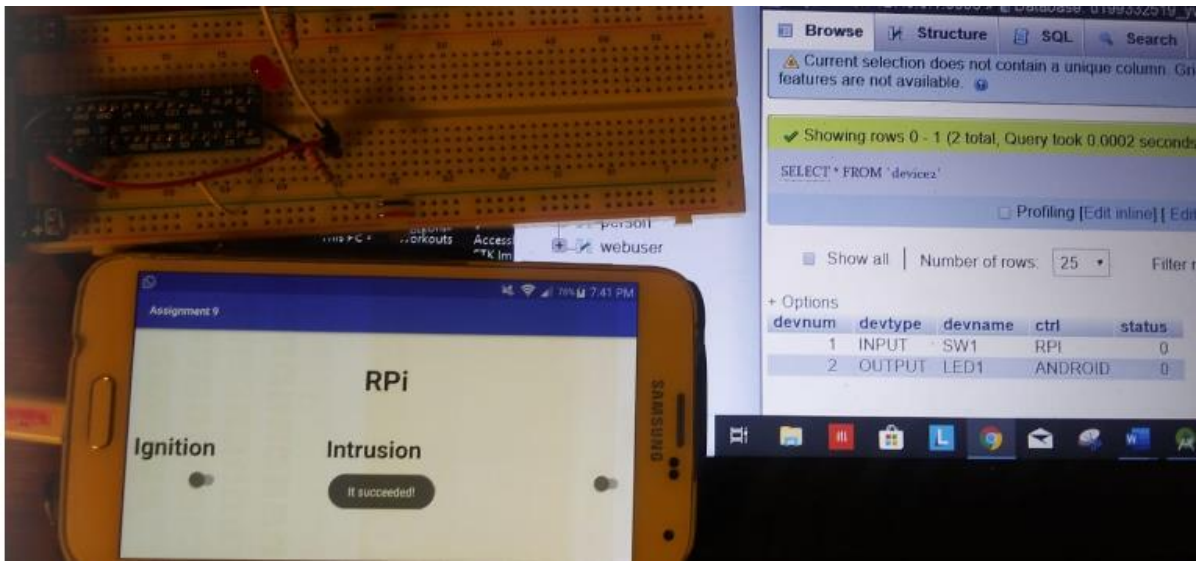
devnum	devtype	devname	ctrl	status
1	INPUT	SW1	RPI	0
2	OUTPUT	LED1	ANDROID	0

devnum	devtype	devname	ctrl	status
1	INPUT	SW1	RPI	1
2	OUTPUT	LED1	ANDROID	0

swipe the Ignition switch to ON, and verify that LED1 on RPi powers ON

```
{"success":1,"SW1":1,"LED1":0,"error":0}
==============Server Response at 2019-06-30 19:40:08.196586==============
+++++Server request successful:
{"success":1,"SW1":1,"LED1":1,"error":0}
==============Server Response at 2019-06-30 19:40:29.760896==============
+++++Server request successful:
Changing LED status as requested by the server
The status of LED1 is 1
The status of SW1 is 1
{"success":1,"SW1":0,"LED1":1,"error":0}
==============Server Response at 2019-06-30 19:40:50.219433==============
+++++Server request successful:
{"success":1,"SW1":0,"LED1":0,"error":0}
==============Server Response at 2019-06-30 19:41:10.685367==============
+++++Server request successful:
Changing LED status as requested by the server
The status of LED1 is 0
The status of SW1 is 0
{"success":1,"SW1":0,"LED1":0,"error":0}
==============Server Response at 2019-06-30 19:41:31.189977==============
+++++Server request successful:
```

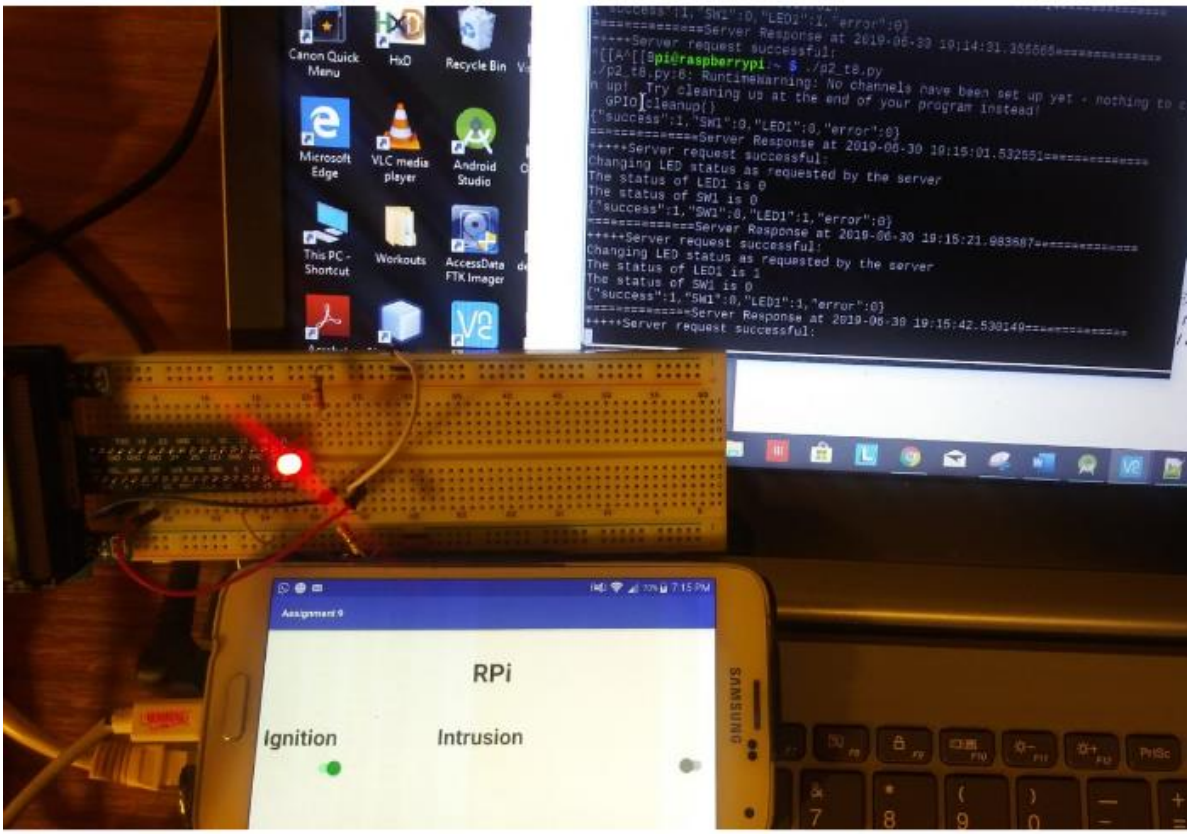




Turn On Ignition

devnum	devtype	devname	ctrl	status
1	INPUT	SW1	RPI	0
2	OUTPUT	LED1	ANDROID	1

```
File  Edit  Tabs  Help
./p2_t8.py:6: RuntimeWarning: No channels have been set up yet - not
n up!  Try cleaning up at the end of your program instead!
  GPIO.cleanup()
{"success":1,"SW1":0,"LED1":0,"error":0}
==============Server Response at 2019-06-30 19:15:01.532551=========
+++++Server request successful:
Changing LED status as requested by the server
The status of LED1 is 0
The status of SW1 is 0
{"success":1,"SW1":0,"LED1":1,"error":0}
==============Server Response at 2019-06-30 19:15:21.983687=========
+++++Server request successful:
Changing LED status as requested by the server
The status of LED1 is 1
The status of SW1 is 0
{"success":1,"SW1":0,"LED1":1,"error":0}
==============Server Response at 2019-06-30 19:15:42.530149=========
+++++Server request successful:
{"success":1,"SW1":0,"LED1":1,"error":0}
==============Server Response at 2019-06-30 19:16:03.125042=========
+++++Server request successful:
{"success":1,"SW1":0,"LED1":1,"error":0}
==============Server Response at 2019-06-30 19:16:23.593096=========
+++++Server request successful:
```



Turn On Intrusion

```
    time.sleep(delay) #wait for delay seconds before sending a
KeyboardInterrupt
pi@raspberrypi:~ $ ./p2_t8.py
/p2_t8.py:6: RuntimeWarning: No channels have been set up yet
 up!  Try cleaning up at the end of your program instead!
  GPIO.cleanup()
/p2_t8.py:8: RuntimeWarning: This channel is already in use,
  Use GPIO.setwarnings(False) to disable warnings.
  GPIO.setup(4,GPIO.OUT) #configure BCM Pin #4 as OUTPUT
{"success":1,"SW1":0,"LED1":0,"error":0}
==========Server Response at 2019-06-30 19:03:47.770944===
+++++Server request successful:
{"success":1,"SW1":1,"LED1":0,"error":0}
==========Server Response at 2019-06-30 19:04:08.227588===
+++++Server request successful:
{"success":1,"SW1":1,"LED1":0,"error":0}
==========Server Response at 2019-06-30 19:04:33.777164===
+++++Server request successful:
{"success":1,"SW1":1,"LED1":0,"error":0}
==========Server Response at 2019-06-30 19:04:54.233813===
+++++Server request successful:
{"success":1,"SW1":1,"LED1":0,"error":0}
==========Server Response at 2019-06-30 19:05:14.719832===
+++++Server request successful:
```

devnum	devtype	devname	ctrl	status
1	INPUT	SW1	RPI	1
2	OUTPUT	LED1	ANDROID	0

3) Emulating a phone:

I was not able to emulate the phone