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2) PHP script to interact with Android:

/public_html/scripts/sync_app_data.php

```
                $stmt->bind_param('s', $in_username);
                $stmt->execute();
                $stmt->store_result(); //store_result to get num_rows etc.
$stmt->bind_result($db_password); //get the hashed password
$stmt->fetch();
                if ($stmt->num_rows == 1) { //if user exists, verify the password
                    if (password_verify($in_password, $db_password)) {
                        $stmt->close();
                        if ($stmt = $mysqli->prepare("UPDATE device set status=?
where devname = 'LED1'")) { //update LED1
                            $stmt->bind_param('i', $in_LED1);
                            $stmt->execute();
                        }

                        if ($stmt = $mysqli->prepare("UPDATE device set status=?
where devname = 'SW1'")) { //update SW1
                            $stmt->bind_param('i', $in_SW1);
                            $stmt->execute();
                        }

```

3) PHP script to interact with RPi:

/public_html/scripts/sync_rpi_data.php

```
<?php
require_once __DIR__ . '/../../required/db_connect.php';
$input = file_get_contents("php://input");
$error=0; $out_json = array(); $out_json['success'] = 1;
$SW1_status=0; $LED1_status=0;
if ($input) {
    $json = json_decode($input, true);
    if (json_last_error() == JSON_ERROR_NONE) {
        if (isset($json["username"]) && isset($json["password"]
        && isset($json["LED1"])) {
            $in_username = $json["username"];
            $in_password = $json["password"];
            $in_SW1 = $json["SW1"];
            $in_LED1 = $json["LED1"];
            if ($stmt=$mysqli->prepare("SELECT password FROM wel
$stmt->bind_param('s', $in_username);
```

4) Python program on RPi to test the script

```
#!/usr/bin/python3
import requests
import datetime
LED1=1
SW1=1
ts=datetime.datetime.now()
print ("Sending the following to the server at" + str(ts) )
print ("Set LED1 to " + str(LED1))
print ("Set SW1 to " + str(SW1))

data = {'username': 'ben', 'password': ' benpass', 'LED1':LED1, 'SW1':SW1}
res = requests.post("https://map3.hostingerapp.com/scripts/sync_app_data.php",
r = res.json()
ts = datetime.datetime.now()
print ("==============Server Response at " + str(ts) + "==============")
if r['success']==1:
                print ("+++++Server request successful: ")
                print ("The status of LED1 is " + str(r['LED1']))
                print ("The status of SW1 is " + str(r['SW1']))
```

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

```
pi@raspberrypi:~ $ ./p1_t8.py
Sending the following to the server at2019-06-28 15:18:57.340177
Set LED1 to 1
==============Server Response at 2019-06-28 15:18:57.924573==============
+++++Server request successful:
The status of LED1 is 1
The status of SW1 is 1
pi@raspberrypi:~ $
```

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

```
pi@raspberrypi:~ $ nano p1_t8.py
pi@raspberrypi:~ $ ./p1_t8.py
Sending the following to the server at2019-06-28 18:26:21.011177
Set LED1 to 0
Set SW1 to 1
==============Server Response at 2019-06-28 18:26:21.440506==============
+++++Server request successful:
The status of LED1 is 0
The status of SW1 is 1
pi@raspberrypi:~ $
```

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

5) Python program on RPi to interact with the server:

```
#!/usr/bin/python
import requests #import JSONRequests library
import time #import time library for sleep function
import datetime #import datetime library for timestamp
import RPi.GPIO as GPIO #import GPIO library
GPIO.cleanup()
GPIO.setmode(GPIO.BCM) #set the pins according to BCM scheme
GPIO.setup(4,GPIO.OUT) #configure BCM Pin #4 as OUTPUT
GPIO.setup(17,GPIO.IN) #configure BCM Pin #17 as INPUT
i=0; n=5; delay=20 #limit number of tries to 5 (initially set it to 1 for debug$
while i<n:
        LED1=GPIO.input(4) #read what BCM Pin #4 is set to (LED1)
        SW1=GPIO.input(17) #read the status of BCM Pin #17 (SW1)
        data = {'username': 'ben', 'password': 'benpass', 'SW1': SW1, 'LED1': LS
        res = requests.post("https://map3.hostingerapp.com/scripts/sync_rpi_dat$
#       print(res.text)
#in case of errors (especially, syntax) , you may want to print res.text and co$
        r = res.json()
        print res.text
```

```
 GNU nano 2.7.4                    File: p2_t8.py                         Modified

        print "==============Server Response at " + str(ts) + "=============="
        if r['success']==1:
                print "+++++Server reques[ successful: "
                if LED1!=r['LED1']:
                        print "Changing LED status as requested by the server"
                        if r['LED1']==1:
                                GPIO.output(4,GPIO.HIGH)
                        else: GPIO.output(4,GPIO.LOW)
                        print "The status of LED1 is " + str(r['LED1'])
                        print "The status of SW1 is " + str(r['SW1'])
        else: print ">>>>> Server request failed - Error #" + str(r['error'])
        time.sleep(delay) #wait for delay seconds before sending another reques
        i+=1
GPIO.cleanup()
```

```
pi@raspberrypi:~ $ ./p2_t8.py
./p2_t8.py:6: RuntimeWarning: No channels have been set up yet - nothing
n up!  Try cleaning up at the end of your program instead!
  GPIO.cleanup()
{"success":1,"SW1":0,"LED1":1,"error":0}
==============Server Response at 2019-06-28 19:36:44.617223==============
+++++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 2019-06-28 19:37:05.183404==============
+++++Server request successful:
{"success":1,"SW1":0,"LED1":1,"error":0}
==============Server Response at 2019-06-28 19:37:25.742551==============
+++++Server request successful:
{"success":1,"SW1":0,"LED1":1,"error":0}
==============Server Response at 2019-06-28 19:37:46.306864==============
+++++Server request successful:
{"success":1,"SW1":1,"LED1":1,"error":0}
==============Server Response at 2019-06-28 19:38:06.916274==============
+++++Server request successful:
pi@raspberrypi:~ $
```

+ Options

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

```
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()
{"success":1,"SW1":1,"LED1":0,"error":0}
==============Server Response at 2019-06-28 19:44:14.518549==============
+++++Server request successful:
Changing LED status as requested by the server
The status of LED1 is 0
The status of SW1 is 1
{"success":1,"SW1":1,"LED1":0,"error":0}
==============Server Response at 2019-06-28 19:44:34.990412==============
+++++Server request successful:
{"success":1,"SW1":0,"LED1":0,"error":0}
==============Server Response at 2019-06-28 19:44:55.462305==============
+++++Server request successful:
{"success":1,"SW1":0,"LED1":0,"error":0}
==============Server Response at 2019-06-28 19:45:15.936907==============
+++++Server request successful:
```

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