The upgraded code of 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; //assume success
$SW1_status = 0;
$SW2_status = 0;
$LED1_status = 0;
$LED2_status = 0;
if ($input)
{
   $json = json_decode($input, true); //check if it json input
   if (json_last_error() == JSON_ERROR_NONE)
   {
      if (isset($json["username"]) && isset($json["password"]) && isset($json["SW1"]) &&
isset($json["SW2"]) && isset($json["LED1"]) && isset($json["LED2"]))
      {
         $in_username = $json["username"];
         $in_password = $json["password"]; //if the expected fields are not null, get them
         $in_SW1 = $json["SW1"];
                        $in_SW2 = $json["SW2"];
         $in_LED1 = $json["LED1"];
         $in_LED2 = $json["LED2"];
         if ($stmt = $mysqli->prepare("SELECT password FROM Users WHERE pname = ? LIMIT
1"))
         {
            $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 SensorsAndActuators SET DeviceStatus=?
WHERE DevID = 'SW1'"))
                  { //update SW1
                     $stmt->bind_param('i', $in_SW1);
                     $stmt->execute();
                  }
                  else
                  {
                     $error = 1;
                  }
```

```
                $stmt->close();
                if (!$error && ($stmt = $mysqli->prepare("SELECT DeviceStatus FROM
SensorsAndActuators WHERE DevID = 'SW1'")))
                { //read SW1
                   $stmt->execute();
                   $stmt->bind_result($SW1_status);
                   $stmt->fetch();
                }
                else
                {
                   $error = 2;
                }
                $stmt->close();
                if ($stmt = $mysqli->prepare("UPDATE SensorsAndActuators SET DeviceStatus=?
WHERE DevID = 'SW2'"))
                { //update SW1
                   $stmt->bind_param('i', $in_SW2);
                   $stmt->execute();
                }
                else
                {
                   $error = 1;
                }
                $stmt->close();
                if (!$error && ($stmt = $mysqli->prepare("SELECT DeviceStatus FROM
SensorsAndActuators WHERE DevID = 'SW2'")))
                { //read SW1
                   $stmt->execute();
                   $stmt->bind_result($SW2_status);
                   $stmt->fetch();
                }
                else
                {
                   $error = 2;
                }
                $stmt->close();
                if (!$error && ($stmt = $mysqli->prepare("SELECT DeviceStatus FROM
SensorsAndActuators WHERE DevID = 'LED1'")))
                { //read LED1
                   $stmt->execute();
                   $stmt->bind_result($LED1_status);
                   $stmt->fetch();
                }
                else
                {
                   $error = 3;
                }
                $stmt->close();
```

```
                    if (!$error && ($stmt = $mysqli->prepare("SELECT DeviceStatus FROM
SensorsAndActuators WHERE DevID = 'LED2'")))
                    { //read LED1
                       $stmt->execute();
                       $stmt->bind_result($LED2_status);
                       $stmt->fetch();
                    }
                    else
                    {
                       $error = 3;
                    }
                    $stmt->close();
                 }
                 else
                 {
                    $error = 4;
                 }
              }
              else
              {
                 $error = 5;
              }
           }
           else
           {
              $error = 6;
           }
        }
        else
        {
           $error = 7;
        }
     }
     else
     {
        $error = 8;
     }
}
else
{
   $error = 9;
}
if ($error)
{
   $out_json['success'] = 0; //flag failure

}
$out_json['SW1'] = $SW1_status;
$out_json['SW2'] = $SW2_status;
```

```
$out_json['LED1'] = $LED1_status;
$out_json['LED2'] = $LED2_status;
$out_json['error'] = $error; //provide error (if any) number for debugging
echo json_encode($out_json); //encode the data in json format

?>
```

The upgraded code of sync_android_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; //assume success
$SW1_status = 0;
$SW2_status = 0;
$LED1_status = 0;
$LED2_status = 0;
if ($input)
{
   $json = json_decode($input, true); //check if it json input
   if (json_last_error() == JSON_ERROR_NONE)
   {
      if (isset($json["username"]) && isset($json["password"]) && isset($json["SW1"]) &&
isset($json["LED1"]) && isset($json["SW2"]) && isset($json["LED2"]))
      {
         $in_username = $json["username"];
         $in_password = $json["password"]; //if the expected fields are not null, get them
         $in_SW1 = $json["SW1"];
         $in_SW2 = $json["SW2"];
         $in_LED1 = $json["LED1"];
         $in_LED2 = $json["LED2"];
         if ($stmt = $mysqli->prepare("SELECT password FROM Users WHERE pname = ? LIMIT
1"))
         {
            $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 SensorsAndActuators SET DeviceStatus=?
WHERE DevID = 'SW1'"))
                  { //update SW1
```

```
                $stmt->bind_param('i', $in_SW1);
                $stmt->execute();
            }
            else
            {
                $error = 1;
            }
            $stmt->close();
            if (!$error && ($stmt = $mysqli->prepare("SELECT DeviceStatus FROM
SensorsAndActuators WHERE DevID = 'SW1'")))
            { //read SW1
                $stmt->execute();
                $stmt->bind_result($SW1_status);
                $stmt->fetch();
            }
            else
            {
                $error = 2;
            }
            $stmt->close();
            if ($stmt = $mysqli->prepare("UPDATE SensorsAndActuators SET DeviceStatus=?
WHERE DevID = 'SW2'"))
            { //update SW1
                $stmt->bind_param('i', $in_SW2);
                $stmt->execute();
            }
            else
            {
                $error = 1;
            }
            $stmt->close();
            if (!$error && ($stmt = $mysqli->prepare("SELECT DeviceStatus FROM
SensorsAndActuators WHERE DevID = 'SW2'")))
            { //read SW1
                $stmt->execute();
                $stmt->bind_result($SW2_status);
                $stmt->fetch();
            }
            else
            {
                $error = 2;
            }
            $stmt->close();
            if (!$error && ($stmt = $mysqli->prepare("SELECT DeviceStatus FROM
SensorsAndActuators WHERE DevID = 'LED1'")))
            { //read LED1
                $stmt->execute();
                $stmt->bind_result($LED1_status);
                $stmt->fetch();
```

```
                }
                else
                {
                    $error = 3;
                }
                $stmt->close();
                if (!$error && ($stmt = $mysqli->prepare("SELECT DeviceStatus FROM
SensorsAndActuators WHERE DevID = 'LED2'")))
                { //read LED1
                    $stmt->execute();
                    $stmt->bind_result($LED2_status);
                    $stmt->fetch();
                }
                else
                {
                    $error = 3;
                }
                $stmt->close();
            }
            else
            {
                $error = 4;
            }
        }
        else
        {
            $error = 5;
        }
    }
    else
    {
        $error = 6;
    }
}
else
{
    $error = 7;
}
}
else
{
    $error = 8;
}
if ($error)
```

```
{
   $out_json['success'] = 0; //flag failure

}
$out_json['SW1'] = $SW1_status;
$out_json['SW2'] = $SW1_status;
$out_json['LED1'] = $LED1_status;
$out_json['LED2'] = $LED1_status;
$out_json['error'] = $error; //provide error (if any) number for debugging
echo json_encode($out_json); //encode the data in json format

?>
```

The upgraded code of p2_t8.py

```
#!/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.setmode(GPIO.BCM) #set the pins according to BCM scheme
GPIO.setup(4,GPIO.OUT) #configure BCM Pin #4 as OUTPUT
GPIO.setup(6,GPIO.OUT) #configure BCM Pin #6 as OUTPUT
GPIO.setup(17,GPIO.IN) #configure BCM Pin #17 as INPUT
GPIO.setup(22,GPIO.IN) #configure BCM Pin #17 as INPUT
i=0; n=3; delay=5  #limit number of tries to 5 (initially set it to 1 for debugging)
while i<n:
        LED1=GPIO.input(4) #read what BCM Pin #4 is set to (LED1)
        LED2=GPIO.input(6) #read what BCM Pin #6 is set to (LED2)
        SW1=GPIO.input(17) #read the status of BCM Pin #17 (SW1)
        SW2=GPIO.input(22) #read the status of BCM Pin #22 (SW2)
        data = {'username': 'Test', 'password': 'Tester3', 'SW1': SW1, 'SW2': SW2, 'LED1': LED1,
'LED2': LED2}
        res = requests.post("https://team2project3342.online/scripts/sync_rpi_data.php", json=data)
        #in case of errors (especially, syntax) , you may want to print res.text and comment out the
statements below
        r = res.json()
        ts = datetime.datetime.now() #get the time stamp
        print "==============Server Response at " + str(ts) + "=============="
        if r['success']==1:
                print "+++++Server request 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)
                if LED2!=r['LED2']:
                        print "Changing LED status as requested by the server"
                        if r['LED2']==1:
```

```
                                GPIO.output(6,GPIO.HIGH)
                            else: GPIO.output(6,GPIO.LOW)
                print "The status of LED1 is " + str(r['LED1'])
                print "The status of LED2 is " + str(r['LED2'])
                print "The status of SW1 is " + str(r['SW1'])
                print "The status of SW2 is " + str(r['SW2'])
        else:
                print ">>>>> Server request failed - Error #" + str(r['error'])
        time.sleep(delay) #wait for delay seconds before sending another request
        i+=1
GPIO.cleanup()
```

The code of Projectv3.py, which is the android app on kivy.

```
import time
import kivy
from kivy.app import App
from kivy.uix.button import Button
from kivy.uix.boxlayout import BoxLayout
from kivy.uix.label import Label
from kivy.uix.switch import Switch
from kivy.clock import Clock
from functools import partial
import requests

class BoxLayoutApp(App):

    #def __init__(self, **kwargs):
        #super(BoxLayoutApp,self).__init__(**kwargs)
    def build(self):
        self.superBox = BoxLayout(orientation ='vertical')

        self.VB1 = BoxLayout(orientation ='vertical')

        self.lbl1 = Label(text="Monitoring System")
        self.VB1.add_widget(self.lbl1)

        localtime = time.asctime(time.localtime(time.time()))
        self.lbl2 = Label(text=localtime)
        self.VB1.add_widget(self.lbl2)

        self.HB1 = BoxLayout(orientation ='horizontal')

        self.lbl3 = Label(text="Status SW1:")
        self.HB1.add_widget(self.lbl3)

        self.sw1=Switch(active=False,
                disabled=True)
```

```
self.HB1.add_widget(self.sw1)
#self.sw1.bind(active=switch_callback1)

self.HB2 = BoxLayout(orientation ='horizontal')
self.lbl4 = Label(text="Status SW2:")
self.HB2.add_widget(self.lbl4)

self.sw2=Switch(active=False,
            disabled=True)
self.HB2.add_widget(self.sw2)
#self.sw2.bind(active=switch_callback2)

self.HB3 = BoxLayout(orientation ='horizontal')
self.lbl5 = Label(text="Status LED1:")
self.HB3.add_widget(self.lbl5)

self.led1=Switch(active=False,
             disabled=False)
self.HB3.add_widget(self.led1)
self.led1.bind(active=switch_callback3)

self.HB4 = BoxLayout(orientation ='horizontal')
self.lbl6 = Label(text="Status LED2:")
self.HB4.add_widget(self.lbl6)

self.led2=Switch(active=False,
             disabled=False)
self.HB4.add_widget(self.led2)
self.led2.bind(active=switch_callback4)

self.HB5 = BoxLayout(orientation ='horizontal')
self.lbl7 = Label(text="Alarm1")
self.HB5.add_widget(self.lbl7)

self.settings5=Switch(active=False)
self.HB5.add_widget(self.settings5)
self.settings5.bind(active=self.switch_callback5)

self.lbl71=Label(text="On since: ")
self.HB5.add_widget(self.lbl71)
self.btn5 = Button(text="acknowledge")
self.btn5.bind(on_press=self.pressed2)
self.HB5.add_widget(self.btn5)

self.HB6 = BoxLayout(orientation ='horizontal')
self.lbl8 = Label(text="Alarm2")
self.HB6.add_widget(self.lbl8)

self.settings6=Switch(active=False)
```

```
        self.HB6.add_widget(self.settings6)
        self.settings6.bind(active=self.switch_callback6)

        self.lbl81=Label(text="On since: ")
        self.HB6.add_widget(self.lbl81)

        self.btn6 = Button(text="acknowledge")
        self.btn6.bind(on_press=self.pressed3)
        self.HB6.add_widget(self.btn6)

        self.HB7 = BoxLayout(orientation ='horizontal')
        self.btn7 = Button(text="Dispense Norepinephrine")
        self.btn7.bind(on_press=self.pressed1)
        self.HB7.add_widget(self.btn7)
        self.btn8 = Button(text="Dispense Nitroglycerin")
        self.btn8.bind(on_press=self.pressed)
        self.HB7.add_widget(self.btn8)
        self.btn9 = Button(text="Dispense Auto")
        self.btn9.bind(on_press=self.presseda)
        self.HB7.add_widget(self.btn9)

        self.superBox.add_widget(self.VB1)
        self.superBox.add_widget(self.HB1)
        self.superBox.add_widget(self.HB2)
        self.superBox.add_widget(self.HB3)
        self.superBox.add_widget(self.HB4)
        self.superBox.add_widget(self.HB5)
        self.superBox.add_widget(self.HB6)
        self.superBox.add_widget(self.HB7)

        #schedule the JSONrequest function to trigger every 5 seconds to read/write database
        event = Clock.schedule_interval(partial(self.JSONrequest),5)

        return self.superBox

    def JSONrequest(self, *largs):
        if(self.sw1.active==True):
            SW1=1
        else:
            SW1=0
        if(self.sw2.active==True):
            SW2=1
        else:
            SW2=0
        if(self.led1.active==True):
            LED1=1
        else:
            LED1=0
        if(self.led2.active==True):
```

```
        LED2=1
    else:
        LED2=0
    data={'username':'Test', 'password':'Tester3','SW1':SW1,'LED1':LED1,'SW2':SW2,'LED2':LED2}
    res=requests.post("http://team2project3342.online/scripts/sync_android_data.php",json=data)
    print(res)
    r=res.json()
    if(SW1!=r['SW1']):
        print("Changing SW1 status to the value in the database.")
        if self.sw1.active==True:
            self.sw1.active=False
            self.led1.active=False
        else:
            self.sw1.active=True
    if(SW2!=r['SW2']):
        print("Changing SW2 status to the value in the database.")
        if self.sw2.active==True:
            self.sw2.active=False
            self.led2.active=False
        else:
            self.sw2.active=True
    return

def pressed(self,instance):
    print ("you picked " + instance.text)
    self.led2.active=True

def pressed1(self,instance):
    print ("you picked " + instance.text)
    self.led1.active=True

def presseda(self,instance):
    print ("you picked " + instance.text)
    if self.sw1.active==True:
        self.led1.active=True
    else:
        self.led1.active=False
    if self.sw2.active==True:
        self.led2.active=True
    else:
        self.led2.active=False

def pressed2(self,instance):
    print ("you acknowleged Alarm1")
    self.settings5.active=False
    print("turning alarm1 off")
def pressed3(self,instance):
    print ("you acknowleged Alarm2")
    self.settings6.active=False
```

```
        print("turning alarm1 off")
    def switch_callback5(self, switchObject, switchValue):
        print('Value of Alarm1: ', switchValue)
        if self.settings5.active==True:
            ltm = time.asctime(time.localtime(time.time()))
            self.lbl71.text+=ltm
        else:
            self.lbl71.text = "On since: "
    def switch_callback6(self, switchObject, switchValue):
        print('Value of Alarm2: ', switchValue)
        if self.settings6.active==True:
            ltm = time.asctime(time.localtime(time.time()))
            self.lbl81.text+=ltm
        else:
            self.lbl81.text = "On since: "

def switch_callback1(switchObject, switchValue):
        print('Value of SW1: ', switchValue)
def switch_callback2(switchObject, switchValue):
        print('Value of SW2: ', switchValue)
def switch_callback3(switchObject, switchValue):
        print('Value of LED1: ', switchValue)
def switch_callback4(switchObject, switchValue):
        print('Value of LED2: ', switchValue)

#class myApp(App):
#    def build(self):
 #       return BoxLayout()

if __name__=="__main__":
    myApp=BoxLayoutApp()
    myApp.run()
   # myApp().run()
```

The code of index.php

```
<?php
require_once __DIR__ . '/../required/db_connect.php';
?>
<html>
    <head>
        <title>Team Project</title>
        <link rel="stylesheet" type="text/css" href="prjct.css"/>
    </head>
    <body>
        <div id="Header">
            <h1>Monitoring System</h1>
        </div>
```

```
<div id="body">
  <h3>Login</h3>
  <form id="form1" method="post" action="">
    <div>
      <label for="usernm">Username: </label>
      <input type="text" name="usernm" id="usernm" required><br><br>
    </div>
    <div>
      <label for="psswrd">Password: </label>
      <input type="password" name="psswrd" id="psswrd" required><br><br>
    </div>
    <button id="sub" type="Submit">Submit</button>
  </form>
</div>
<div id="check">
  <?php
  if(isset($_POST['usernm']) and isset($_POST['psswrd'])){
    $uname=$_POST['usernm'];
    $passwrd=$_POST['psswrd'];

    if($query = $mysqli->prepare("SELECT * FROM Users WHERE pname='$uname'")){
      $query->execute();
      $query->bind_result($username,$password);
      $count=0;
      while($query->fetch()){
        $count=$count+1;
      }
      if ($count == 1){
        if(password_verify($passwrd,$password)){
          $query->close();
          $id='9';
          date_default_timezone_set("America/Chicago");
          $date=date("Y-m-d H:i:s");
          $stmt=$mysqli->prepare("INSERT INTO
TransactionalLogs(TimestampInfo,MessageID,DataInformation) VALUES(?,?,?)");
          $stmt->bind_param('sss',$date,$id,$uname);
          $stmt->execute();
          $stmt->close();
          echo "<script type='text/javascript'>alert('Login Credentials verified')</script>";
          echo "<script> window.location.assign('welcome.php');</script>";
        }
        else{
        //echo "Login Credentials verified";
        echo "<script type='text/javascript'>alert('Login Credentials do not match')</script>";

        }
      }
      else{
      echo "<script type='text/javascript'>alert('Invalid Login Credentials')</script>";
```

```
                //echo "Invalid Login Credentials";
                }
            }
            else{
                echo "Error in if 2";
            }
        }
        ?>
    </div>
  </body>
</html>
```

The code of DBDevice.php

```
<?php
require_once __DIR__ . '/../required/db_connect.php';
?>
<?php
date_default_timezone_set("America/Chicago");
echo "Last update: " . date('m/d/y') . " " . date('h:i:sa') . "<br>";
echo "<h3>Status of Sensors and Acutators</h3>";
if ($stmt=$mysqli->prepare("SELECT * FROM SensorsAndActuators LIMIT 100")) {
   $stmt->execute();
   $stmt->bind_result($devid,$devtype,$devfun,$ctrl,$status);
   echo "<table><tr><td>Device Name</td><td>Status</td></tr>";
   while ($stmt->fetch()) {
      echo "<tr><td>$devid</td><td>$status</td></tr>";
   }
   echo "</table>";
   $stmt->close();
}
else {
   echo "error";
   $mysqli->close();
}
echo "====================================" . "<br>";
echo "<h3>Alarm Status</h3>";
if ($stmt=$mysqli->prepare("SELECT a1.AlarmID, a1.SinceTS,
a1.AcknowledgementStatus,c1.MessageDescription FROM ActiveAlarms a1 LEFT JOIN Alarms a2
ON a1.AlarmID=a2.AlarmID LEFT JOIN CannedMessages c1 ON a2.MessageID=c1.MessageID")) {
   $stmt->execute();
   $stmt->bind_result($alarmid,$since,$acknowl,$description);
   echo "<table><tr><td>Alarm</td><td>Description</td><td>Since</td><td>Acknowledged</td></
tr>";
   while ($stmt->fetch()) {
      if ($acknowl!=1){
         echo "<tr><td>$alarmid</td><td>$description</td><td>$since</td><td>$acknowl</td></tr>";
      }
```

```
    }
    echo "</table>";
    $stmt->close();
}
else {
    echo "error";
    $mysqli->close();
}
echo "====================================" . "<br>";
echo "<h3>Charts</h3>";
if($stmt = $mysqli->prepare("Select MessageID, TimestampInfo FROM TransactionalLogs WHERE
MessageID=13 OR MessageID=14 ORDER BY TimestampInfo")){
    $stmt->execute();
    $stmt->bind_result($idNum,$time);
}
$datat[]=array();
$datan[]=array();
while($stmt->fetch()){
    $datat[]=$time;
    $datan[]=$idNum;
}
?>
<script src='https://cdn.jsdelivr.net/npm/chart.js@2.8.0'></script>
<script>var ctx = document.getElementById('chart1').getContext('2d');
    var chart=newChart(ctx,{
        type:'line',
        data:{
            labels:$datat,
            datasets:[{label:'LED Tracking',
                data:$datan
            }]
        },
        options:{}
    });
</script>";
```