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A4 Batch

**EXPERIMENT NO : 13**

**TITLE :**

**Develop a Real time application like smart home with following requirements: When the user enters into the house the required appliances like fan, light should be switched ON. Appliances should also get controlled remotely by a suitable web interface. The objective of this application is that student should construct complete Smart application in groups.**

**CODE:**

**HTML Code**

**<html>**

**<title>Home Automation Demo</title>**

**<body bgcolor=#C7C7FF>**

**<center>**

**<h1 style="color:#FF0000">MicroEmbedded Technologies</h1> <h2 style="color:#00AF00">Home Appliance Control</h2> <form action="index.php">**

**Door Latch &nbsp<button type="submit" name="op" value="1"> OFF</button> &nbsp &nbsp <button type="submit" name="op" value="2"> ON</button> <br><br>**

**Light1 &nbsp<button type="submit" name="op" value="3"> OFF</button> &nbsp &nbsp <button type="submit" name="op" value="4"> ON</button> <br><br>**

**Fan1 &nbsp<button type="submit" name="op" value="5"> OFF</button> &nbsp &nbsp <button type="submit" name="op" value="6"> ON</button> <br><br>**

**Light2 &nbsp<button type="submit" name="op" value="7"> OFF</button> &nbsp &nbsp <button type="submit" name="op" value="8"> ON</button> <br><br>**

**Fan2 &nbsp<button type="submit" name="op" value="9"> OFF</button> &nbsp &nbsp <button type="submit" name="op" value="10"> ON</button> <br><br>**

**Light3 &nbsp<button type="submit" name="op" value="11"> OFF</button> &nbsp &nbsp <button type="submit" name="op" value="12"> ON</button> <br><br>**

**Fan3 &nbsp<button type="submit" name="op" value="13"> OFF</button> &nbsp &nbsp <button type="submit" name="op" value="14"> ON</button> <br><br>**

**Appliance 1 &nbsp<button type="submit" name="op" value="15">**

**OFF</button> &nbsp &nbsp <button type="submit" name="op" value="16">**

**ON</button> <br><br>**

**Appliance 2 &nbsp<button type="submit" name="op" value="17"> OFF</button> &nbsp &nbsp <button type="submit" name="op" value="18"> ON</button> <br><br>**

**<!--input type="submit" value="Submit"-->**

**</form>**

**</center>**

**</body>**

**</html>**

**PHP Code**

**<!DOCTYPE html>**

**<?php**

**$op = $\_GET['op'];**

**shell\_exec("/usr/local/bin/gpio -g mode 6 out");** **#FAN1**

**shell\_exec("/usr/local/bin/gpio -g mode 16 out"); #FAN2**

**shell\_exec("/usr/local/bin/gpio -g mode 21 out");**

**shell\_exec("/usr/local/bin/gpio -g mode 22 out"); #Mains2**

**shell\_exec("/usr/local/bin/gpio -g mode 23 out"); #Light1**

**shell\_exec("/usr/local/bin/gpio -g mode 24 out");**

**shell\_exec("/usr/local/bin/gpio -g mode 25 out"); #Light3**

**shell\_exec("/usr/local/bin/gpio -g mode 5 out");**

**shell\_exec("/usr/local/bin/gpio -g mode 27 out"); #Mains1**

**#Door Latch**

**#Light2**

**#FAN3**

**switch($op){**

**case 1: shell\_exec("/usr/local/bin/gpio -g write 21 0");#Door Latch OFF break;**

**case 2: shell\_exec("/usr/local/bin/gpio -g write 21 1");#Door Latch ON break;**

**case 3: shell\_exec("/usr/local/bin/gpio -g write 23 0");#Light 1 break;**

**case 4: shell\_exec("/usr/local/bin/gpio -g write 23 1"); break;**

**case 5: shell\_exec("/usr/local/bin/gpio -g write 6 0");#FAN1 break;**

**case 6: shell\_exec("/usr/local/bin/gpio -g write 6 1"); break;**

**case 7: shell\_exec("/usr/local/bin/gpio -g write 24 0");#Light2 break;**

**case 8: shell\_exec("/usr/local/bin/gpio -g write 24 1"); break;**

**case 9: shell\_exec("/usr/local/bin/gpio -g write 16 0");#FAN2 break;**

**case 10: shell\_exec("/usr/local/bin/gpio -g write 16 1"); break;**

**case 11: shell\_exec("/usr/local/bin/gpio -g write 25 0");#Light3 break;**

**case 12: shell\_exec("/usr/local/bin/gpio -g write 25 1"); break;**

**case 13: shell\_exec("/usr/local/bin/gpio -g write 5 0");#FAN3 break;**

**case 14: shell\_exec("/usr/local/bin/gpio -g write 5 1"); break;**

**case 15: shell\_exec("/usr/local/bin/gpio -g write 27 0");#Mains1 break;**

**case 16: shell\_exec("/usr/local/bin/gpio -g write 27 1"); break;**

**case 17: shell\_exec("/usr/local/bin/gpio -g write 22 0");#Mains2**

**break;**

**case 18: shell\_exec("/usr/local/bin/gpio -g write 22 1"); break;**

**default:shell\_exec("/usr/local/bin/gpio -g write 21 0"); shell\_exec("/usr/local/bin/gpio -g write 22 0"); shell\_exec("/usr/local/bin/gpio -g write 23 0"); shell\_exec("/usr/local/bin/gpio -g write 24 0");**

**shell\_exec("/usr/local/bin/gpio -g write 25 0");**

**shell\_exec("/usr/local/bin/gpio -g write 26 0");**

**shell\_exec("/usr/local/bin/gpio -g write 27 0");**

**shell\_exec("/usr/local/bin/gpio -g write 5 0");**

**shell\_exec("/usr/local/bin/gpio -g write 16 0");**

**}**

**include("page.html");**

**?>**

**Python Code**

**import time**

**import RPi.GPIO as GPIO**

**RUNNING = True**

**HIGH = 1**

**LOW =0**

**PIRPin = 4**

**DOORpin = 21**

**LIGHT1pin = 23**

**LIGHT2pin = 24**

**LIGHT3pin = 25**

| **FAN1pin** | **= 6** |
| --- | --- |
| **FAN2pin** | **= 16** |
| **FAN3pin** | **= 5** |
| **Mains1pin = 27** |  |
| **Mains2pin = 22** |  |

**def InitSystem():**

**GPIO.setmode(GPIO.BCM)**

**GPIO.setup(PIRPin,GPIO.IN,pull\_up\_down=GPIO.PUD\_UP)**

**GPIO.setup(DOORpin,GPIO.OUT)**

**GPIO.setup(LIGHT1pin,GPIO.OUT)**

**GPIO.setup(LIGHT2pin,GPIO.OUT)**

**GPIO.setup(LIGHT3pin,GPIO.OUT)**

**GPIO.setup(FAN1pin,GPIO.OUT)**

**GPIO.setup(FAN2pin,GPIO.OUT)**

**GPIO.setup(FAN3pin,GPIO.OUT)**

**GPIO.setup(Mains1pin,GPIO.OUT)**

**GPIO.setup(Mains2pin,GPIO.OUT)**

**return**

**def DetectPerson():**

**#while True:**

**input\_state = GPIO.input(PIRPin)**

**time.sleep(0.3)**

**if input\_state == 0:**

**return LOW**

**else:**

**return HIGH**

**try:**

| **print "\n\n** | **Home Automation Testing\n\n"** |
| --- | --- |
| **print "-----------------------------------------------** | **\n"** |
| **InitSystem()** |  |
| **count =0;** |  |
| **count\_flag =0** |  |
| **door\_flag =0** |  |
| **elapsed =0** |  |

**start = time.time()**

**while RUNNING:**

**state = DetectPerson()**

**if state == HIGH:**

**if count\_flag == 1:**

**count\_flag =0**

**count+=1**

**print "Person Detected\n"**

**else:**

**count\_flag = 1**

**#print "Waiting for Next Person. Time elapsed %d\n" %elapsed if count == 0:**

**GPIO.output(DOORpin,0)**

**GPIO.output(LIGHT1pin,0)**

**GPIO.output(LIGHT2pin,0)**

**GPIO.output(LIGHT3pin,0)**

**GPIO.output(FAN1pin,0)**

**GPIO.output(FAN2pin,0)**

**GPIO.output(FAN3pin,0)**

**GPIO.output(Mains1pin,0)**

**GPIO.output(Mains2pin,0)**

**door\_flag =1**

**elif count ==1:**

**if door\_flag == 1:**

**door\_flag =0**

**GPIO.output(DOORpin,1)**

**time.sleep(1)**

**GPIO.output(DOORpin,0)**

**elif count ==2:**

**GPIO.output(LIGHT1pin,1)**

**GPIO.output(FAN1pin,1)**

**elif count ==3:**

**GPIO.output(LIGHT2pin,1)**

**GPIO.output(FAN2pin,1)**

**elif count ==4:**

**GPIO.output(LIGHT3pin,1)**

**GPIO.output(FAN3pin,1)**

**else:**

**GPIO.output(Mains1pin,1)**

**GPIO.output(Mains2pin,1)**

**time.sleep(5)**

**count =0**

**elapsed = time.time() - start**

**if elapsed > 120:** **#2 min timeout**

**print "\nTimeout Occured. Restart Program"**

**break;**

* **If CTRL+C is pressed the main loop is broken except KeyboardInterrupt:**

**RUNNING = False print "\nStopping"**

* **Actions under 'finally' will always be called finally:**
  + **Stop and finish cleanly so the pins**
  + **are available to be used again GPIO.cleanup()**

**OUTPUT:**



