**PRACTICAL – 9**

**Write a program to understand the use of Firebase with Raepberry Pie to control sensors.**

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|  | **Hardware requirements :**   * Raspberry Pi Board ( we use Raspberry Pi3 board ) + Accessories * DHT11 Temperature and Humidity Sensor with Resistor 4.7 K Ohm ( or SHT31 ) * Some coding skills.   **What is Firebase?**  Firebase is Backend as a Service ( BaaS ) by Google. Firebase gives you many tools to develop high-quality apps, grow your user base, and earn more money. We cover the essentials so you can monetize your business and focus on your users.  In This Project. We are focus on Realtime Database first  https://1.bp.blogspot.com/-7S93VjUYmKE/WizpaZXlt6I/AAAAAAAAv38/vJ3cGC-O7U8NbqBsR-zCk0Q3fR4xLjVswCK4BGAYYCw/s640/Screen%2BShot%2B2017-12-10%2Bat%2B2.54.14%2BPM.png  **Real Time Database**  The Firebase Realtime Database is a cloud-hosted NoSQL database that lets you store and sync data between your users in realtime.  Updated data syncs across connected devices in milliseconds, and data remains available if your app goes offline, providing a great user experience regardless of network connectivity.  Add New Project  https://3.bp.blogspot.com/-xuSdECL2sMs/WjI9qCvy4nI/AAAAAAAAwEI/spoIZET_mpMZxk597wJpr8NES6Oidk1YQCLcBGAs/s640/Firebase_add-new-project.png  Add Project Name  https://1.bp.blogspot.com/-SoWzuCfWEXI/WjI9qOySnzI/AAAAAAAAwEE/F7nzVwHHexgdLzfTA6VSOC83seGVwxQnACLcBGAs/s400/Firebase_add-project.png  Menu Database  https://4.bp.blogspot.com/-PAdvVwJp6HM/WjI9rD1yJVI/AAAAAAAAwEU/lSqAn4rpOCUb2N9n68Z12__226Zwd06kwCLcBGAs/s640/firebase_realtime-database.png  Change Rules  // These rules require authentication  {    "rules": {      ".read": "auth != null",      ".write": "auth != null"    }  }  Change to this  Warning !!!  This is for test first. Anyone can read and write your database without authentication.  // These rules are not require authentication  {  "rules": {  ".read": true ,  ".write": true  }  }  https://3.bp.blogspot.com/-Kjygrru141E/WjI9qMvlllI/AAAAAAAAwEA/nJ_HwPju4XkQzZWf2NmtZMYvmrOAigiXQCLcBGAs/s640/firebase-rules.png  Your Realtime Database is ready to use. and show URL Link for your firebase realtime database. ( https://raspberrypi-3d41f.firebaseio.com/ )  https://3.bp.blogspot.com/-3V4H-X-_UzI/WjI9q1fsfwI/AAAAAAAAwEQ/EDugRCbK0i0SR7psomamZ_kFS8n1X7y7wCLcBGAs/s640/firebase_database.png  Now Make Raspberry Pi sent data to Firebase Realtime Database  https://2.bp.blogspot.com/-TSHuYnX5MuY/WLZiR4tASgI/AAAAAAAAnrU/DCEMDYMoNjM-agZYYNO8ouba3XNk0lQVwCLcB/s640/raspberrypi_dht_oled.png  Hardware requirement:   * Raspberry Pi Board ( we use Raspberry Pi3 board ) + Accessories * DHT11 Temperature and Humidity Sensor with Resistor 4.7 K Ohm ( or DHTxx ) * I2C OLED Display ( 128 x 64 0.96' SSD1306 chip ) for Option ( [Install OLED Library](https://raspberrypi4u.blogspot.com/2017/01/raspberry-pi-oled-i2c.html) )   **Install DHT Python Library**  $  git clone https://github.com/adafruit/Adafruit\_Python\_DHT.git  $  cd Adafruit\_Python\_DHT  $  sudo apt-get install build-essential python-dev python-openssl  $  sudo python setup.py install  **Install Firebase Python Library**  $  sudo pip install requests==1.1.0  $  sudo pip install python-firebase Python Source Code on Github <https://github.com/amphancm/Raspberrypi_Firebase>  Code  dht-firebase.py ( without OLED Display)  dht-firebase-oled.py ( need OLED display )  and Minecraftia.ttf is font for OLED.  Code:   |  | | --- | |  | | import RPi.GPIO as GPIO | |  | from time import sleep | |  | import datetime | |  | from firebase import firebase | |  | import Adafruit\_DHT | |  |  | |  | import urllib2, urllib, httplib | |  | import json | |  | import os | |  | from functools import partial | |  |  | |  | GPIO.setmode(GPIO.BCM) | |  | GPIO.cleanup() | |  | GPIO.setwarnings(False) | |  |  | |  | # Sensor should be set to Adafruit\_DHT.DHT11, | |  | # Adafruit\_DHT.DHT22, or Adafruit\_DHT.AM2302. | |  | sensor = Adafruit\_DHT.DHT11 | |  |  | |  | # Example using a Beaglebone Black with DHT sensor | |  | # connected to pin P8\_11. | |  | pin = 4 | |  |  | |  | # Try to grab a sensor reading. Use the read\_retry method which will retry up | |  | # to 15 times to get a sensor reading (waiting 2 seconds between each retry). | |  | humidity, temperature = Adafruit\_DHT.read\_retry(sensor, pin) | |  |  | |  |  | |  | firebase = firebase.FirebaseApplication('https://YOUR\_FIREBASE\_URL.firebaseio.com/', None) | |  | #firebase.put("/dht", "/temp", "0.00") | |  | #firebase.put("/dht", "/humidity", "0.00") | |  |  | |  | def update\_firebase(): | |  |  | |  | humidity, temperature = Adafruit\_DHT.read\_retry(sensor, pin) | |  | if humidity is not None and temperature is not None: | |  | sleep(5) | |  | str\_temp = ' {0:0.2f} \*C '.format(temperature) | |  | str\_hum = ' {0:0.2f} %'.format(humidity) | |  | print('Temp={0:0.1f}\*C Humidity={1:0.1f}%'.format(temperature, humidity)) | |  |  | |  | else: | |  | print('Failed to get reading. Try again!') | |  | sleep(10) | |  |  | |  | data = {"temp": temperature, "humidity": humidity} | |  | firebase.post('/sensor/dht', data) | |  |  | |  |  | |  | while True: | |  | update\_firebase() | |  |  | |  | #sleepTime = int(sleepTime) | |  | sleep(5) | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  |   https://2.bp.blogspot.com/-JcPernpaB8U/WLZ8WJgaEGI/AAAAAAAAnrk/ZzTQe71jmJczyaaa0jfUuphaQe8WXxvQQCLcB/s400/RaspberryPi_DHT_OLED.jpg |
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