**SMART KITCHEN USING IOT**

INTODUCTION:

OVERVIEW:

The applications of Information communication technology have brought a sea change in human life. The present day society is moving towards the adaptation of the digital environment. The earlier ‘internet of computers’ transformed into ‘internet of people’ by introduction of social websites. The next wave is mobile computing. The different generations of internet connection have made it possible for faster accessibility accompanied by better quality. The further advancement of this technology is the ‘Internet of Things’ through which, the interoperability and intelligence can be achieved. This is possible through communication between certain devices that are connected through the internet, wireless sensor networks and smart phones.These devices in the system are able to perceive, process and deliver the product as per the programming. The technologies such as sensors, Cloud Computing, Networking Technology and Nanotechnology have been used. The applications of IoT can be observed in number of areas in various kitchens.

**PURPOSE:**

Kitchen is the unique place, called the main hub or the heart of the home or hotel industries. It is the place where one of the basic needs i.e. food is prepared. It is the common centre of social activities of all the family members who share their feelings or emotions. It is equipped with all basic amenities. Smart Kitchen is a technologically advanced system that incorporates interactive services. It is a built in system which consists of a dangerous items like electric stove, Gas cylinders, Fridge, oil and etc. The reader and tags to provide all the necessary information regarding the safety level of all the items in kitchen. In this paper the different technologies, and applications involved in IoT, in different fields and a special mention regarding its role in Smart Kitchen has been discussed

**LITERATURE SURVEY**

**Existing problem:**

Intelligent System for Domestic Gas Appliances using IOT. In our day-to-day life there is  serious threat about leakage which leads to suffocation when inhaled,  when ignited leads to explosion and causes a number of deaths.

**PROPOSED SOLUTION**

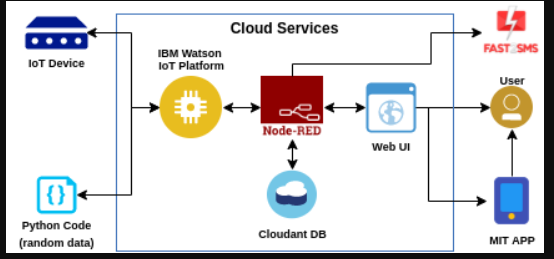
This project is about designing a LPG leakage monitoring system which is proposed for home safety. This system detects the leakage of the LPG and alerts the consumer about the leak by SMS and as an emergency measure the system will turnoff the power supply, while activating the  alarm.

**FEATURES OF OUR PROJECT:**

* We can replace all the regular storage jars with smart jars, which send an alert when the jar gets empty or the measured sensor value is below the threshold.
* These jars communicate with the controller through Nrf communication.
* The cylinder is attached with a leakage sensor that detects the leakage from the cylinder and sends a notification if any leakage is detected.
* If any leakage is detected the exhaust fans are automatically switched ON.
* Cylinder weight is also measured and sends an alert when it is empty, based on the empty cylinder weight.
* All these parameters can be monitored by both Mobile App and Web App.

**THEORITICAL ANALYSIS**

**Block Diagram:**

****

**Hardware/Software Designing:**

**Software Designing**

* Python code for taking initial values for jars and cylinder and leakage sensors
* We also used manual fan on and fan oof used when we detect leakage.
* Designing of nodes for web application in nodered service
* Designing blocks in mit app inventor for android application
* Storing the data in cloudant service
* Using fastsms services to send alert messages to our phone by URL

**EXPERIMENTAL INVESTIGATION:**

First of all our project it is smart kitchen using iot. Here we replaces jars with smart jars and by using leakage sensor but as we are using software so we actually take some threshold values for it in our code .and our jarweight and cylinderweights are send or display to web application and mobile app .so to generate random values like sensor data(we have a python code and this is connected to ibmiot platform with the installed libraries ,and we have to display this in UI interface(web application) . we have nodered service ,sensor data is given to ibmiot node in node red and by connecting this to cloudant node we can get this data or store this data in cloudantdb and from this ibmiot node connecting to fuction node we can display the sensor data in UI interface(web application)and to get the data in moblie app we use the help of mit app inventor we designed the interface for mobile app and designed the blocks and with this we can get sensor data to mobile app. We also used fastsms service to receive alert messages to our mobile

**Python (source code)**

**import time**

import sys

import ibmiotf.application

import ibmiotf.device

import random

import json

#Provide your IBM Watson Device Credentials

organization = "fxocv2"

deviceType = "iotdevice"

deviceId = "1001"

authMethod = "token"

authToken = "7382651854"

# Initialize the device client.

#taking predefined values for jarweight and cylinderweight assuming 40 and 35 values respevtively.

#here we are assuming after 20 loops the leakage sensor will be detected.

jar=40

cy=35

lek=0

fan="off"

leak="off"

i=0

def myCommandCallback(cmd):

print("Command received: %s" % cmd.data['command'])

if cmd.data['command']=='fanon':

print("Fan ON IS RECEIVED")

elif cmd.data['command']=='fanoff':

print("Fan OFF IS RECEIVED")

if cmd.command == "setInterval":

if 'interval' not in cmd.data:

print("Error - command is missing required information: 'interval'")

else:

interval = cmd.data['interval']

elif cmd.command == "print":

if 'message' not in cmd.data

print("Error - command is missing required information: 'message'")

else:

print(cmd.data['message'])

try:

deviceOptions = {"org": organization, "type": deviceType, "id": deviceId, "auth-method": authMethod, "auth-token": authToken}

deviceCli = ibmiotf.device.Client(deviceOptions)

#..............................................

except Exception as e:

print("Caught exception connecting device: %s" % str(e))

sys.exit()

# Connect and send a datapoint "hello" with value "world" into the cloud as an event of type "greeting" 10 times

deviceCli.connect()

#we are assuming after cy=0 and jar=0 then the cylinder and jar status as empty.

while True:

cy=cy-1

jar=jar-1

lek=lek+1

if(cy==0):

print("cylinder is empty")

cy=35

if(jar==0):

print("jar is empty")

jar=40

#here we assumed after 20 loops cylinder will be leaked.and sensor will be detected.becoz as we are not using any sensor.

if(lek==20):

print("gas is leaking so switch on the fan")

lek=0

data = {"d":{ 'cylinderweight' : cy, 'jarweight' : jar, 'leakagesensor' : lek }}

print (data)

def myOnPublishCallback():

print ("Published cylinderweight = %s %%" % cy,"jarweight = %s %%" % jar, "leakagesensor = %s %%" % lek, "to IBM Watson")

success = deviceCli.publishEvent("Data", "json", data, qos=0, on\_publish=myOnPublishCallback)

if not success:

print("Not connected to IoTF")

time.sleep(1)

deviceCli.commandCallback = myCommandCallback

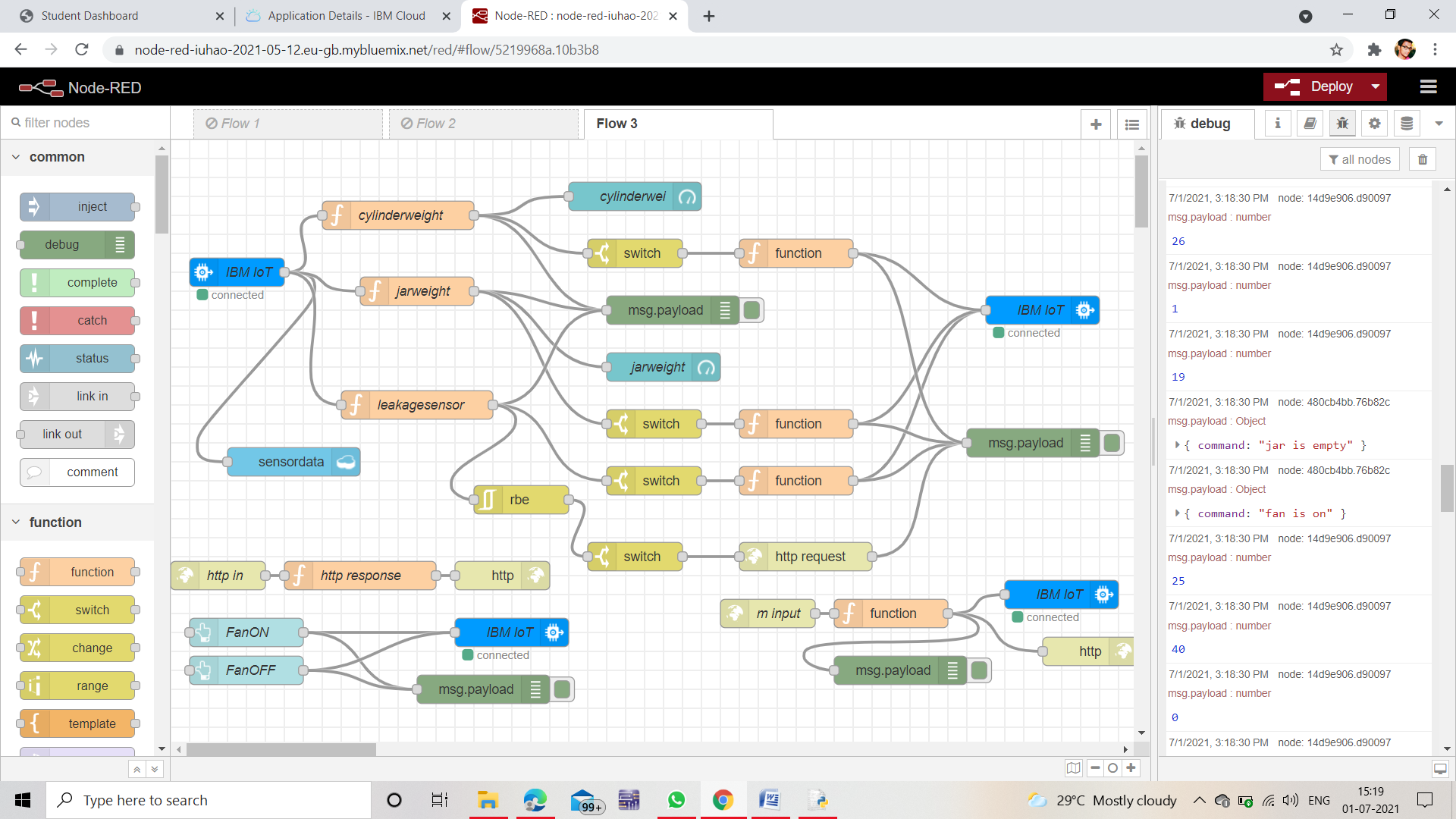
# Disconnect the device and application from the cloud

deviceCli.disconnect()

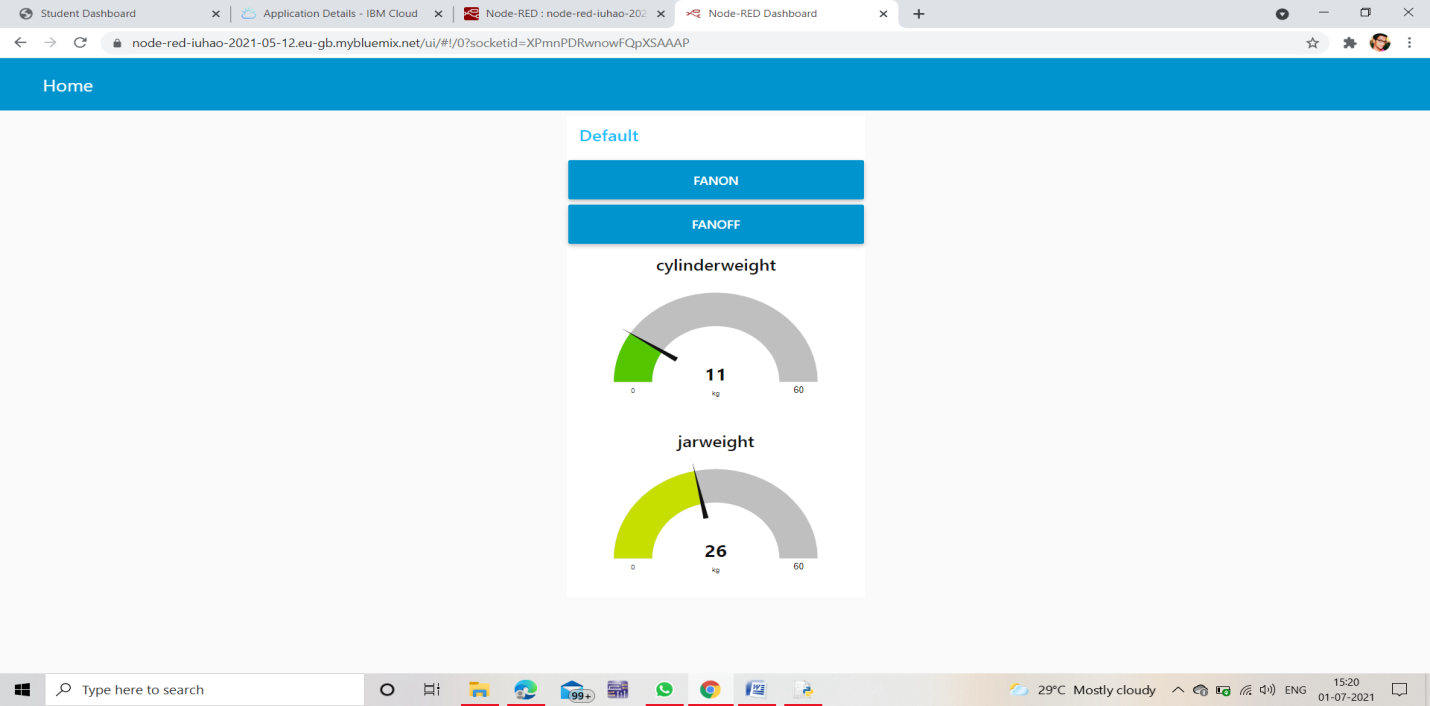
output of python code



**Designing of nodered flow to visualise sensor data in web application**

****

**Visualizing sensor data in web (ui) User Interface:**

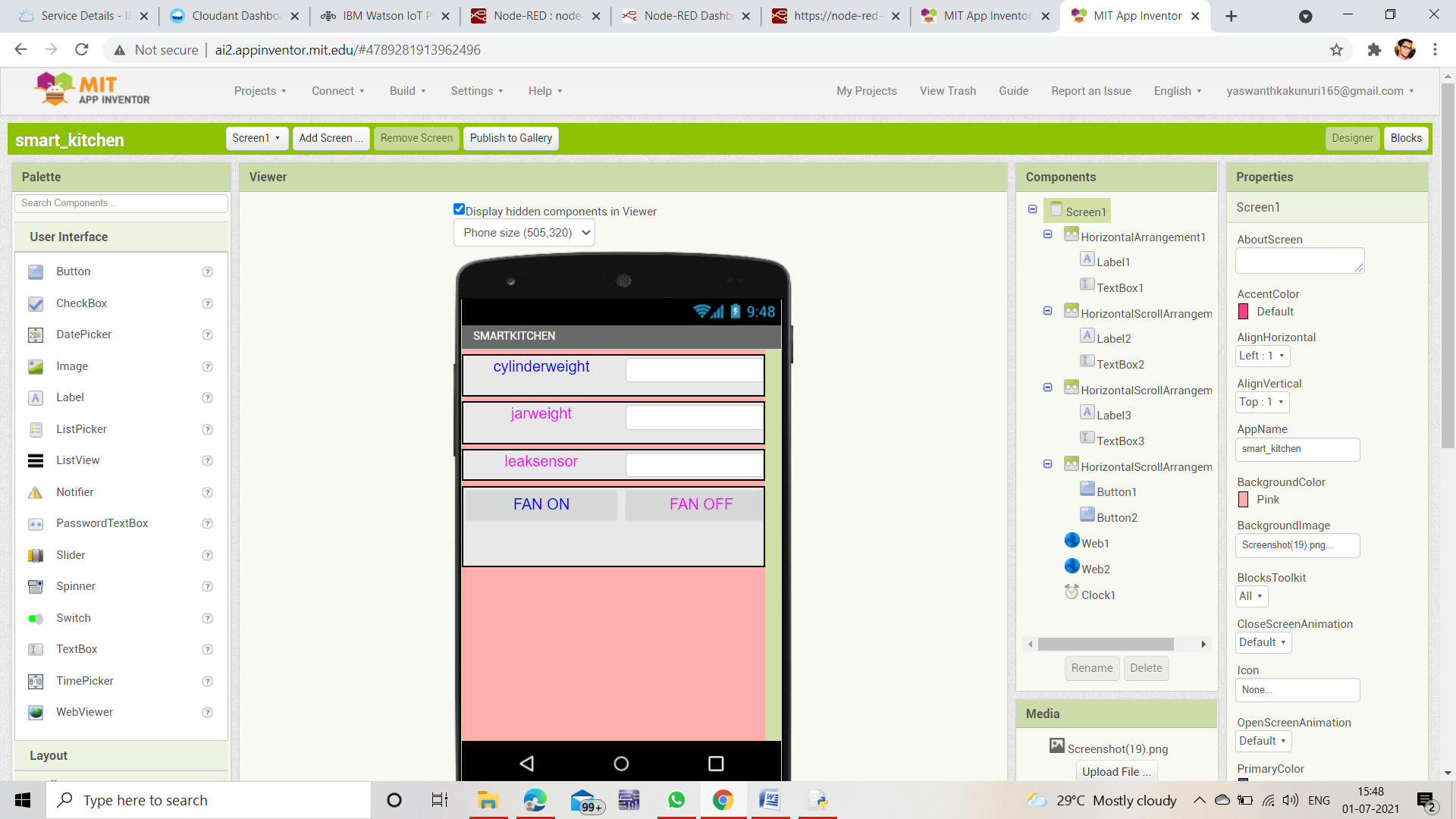
****

**RECEIVING ALERT MESSAGES BY UING FASTSMS SERVICES**

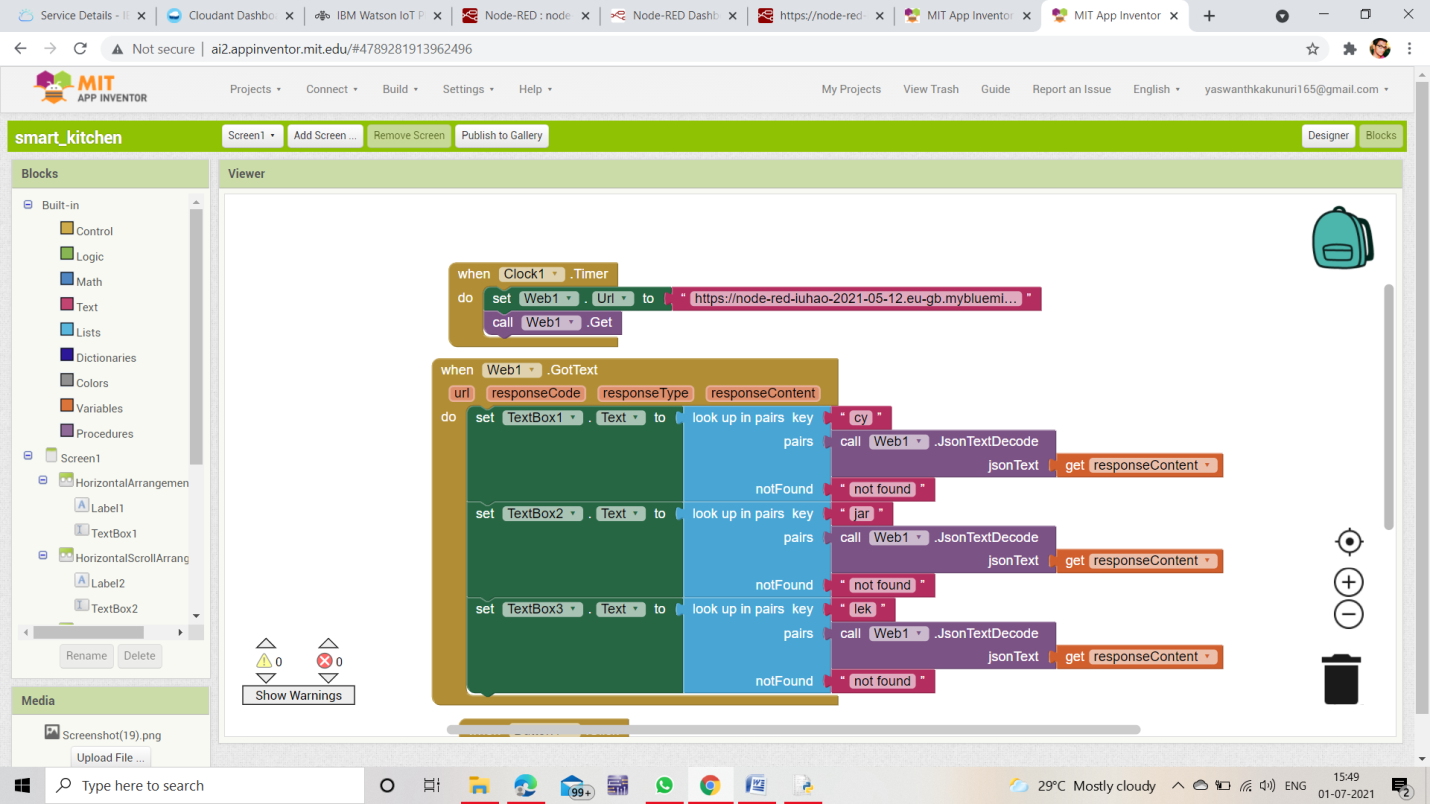
****

Designing app interface for the displaying the sensor data:

BY using mitapp inventer here we create an apk file by we receive data from node red payload

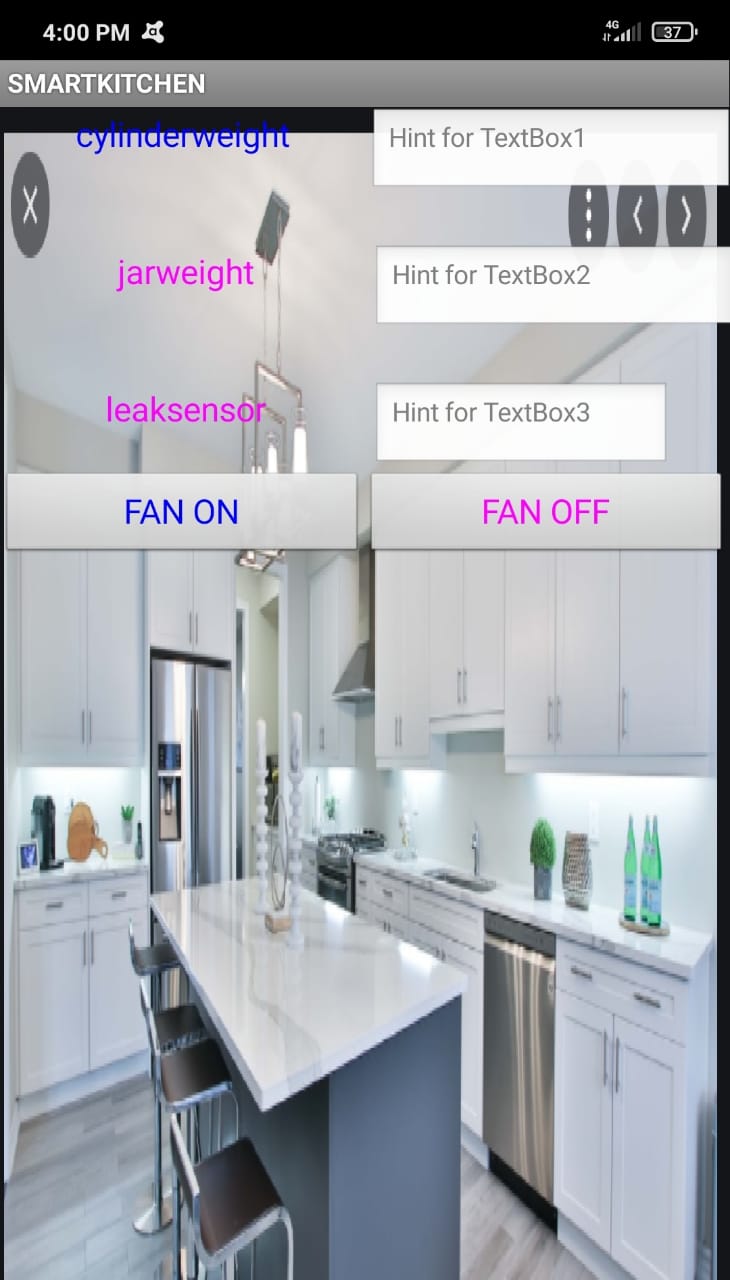


**Designing blocks in mit app inventor:**

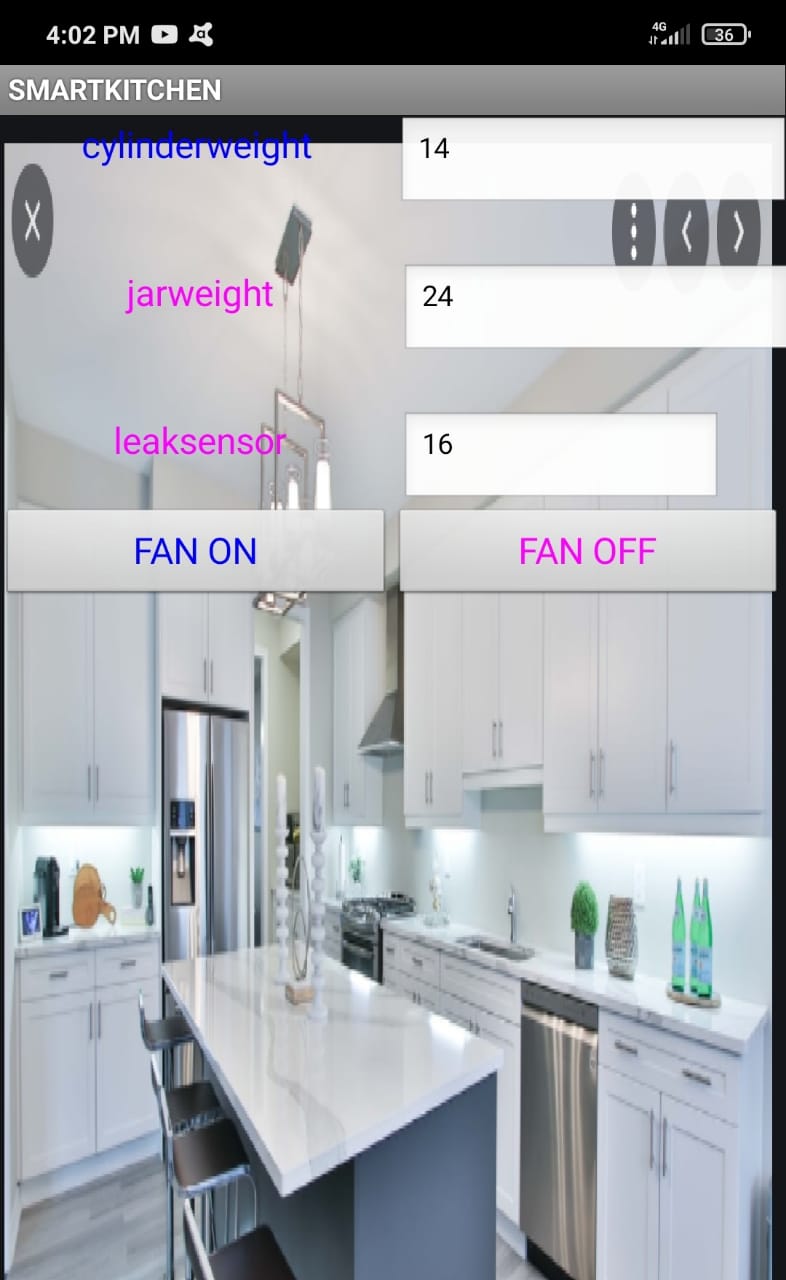
****



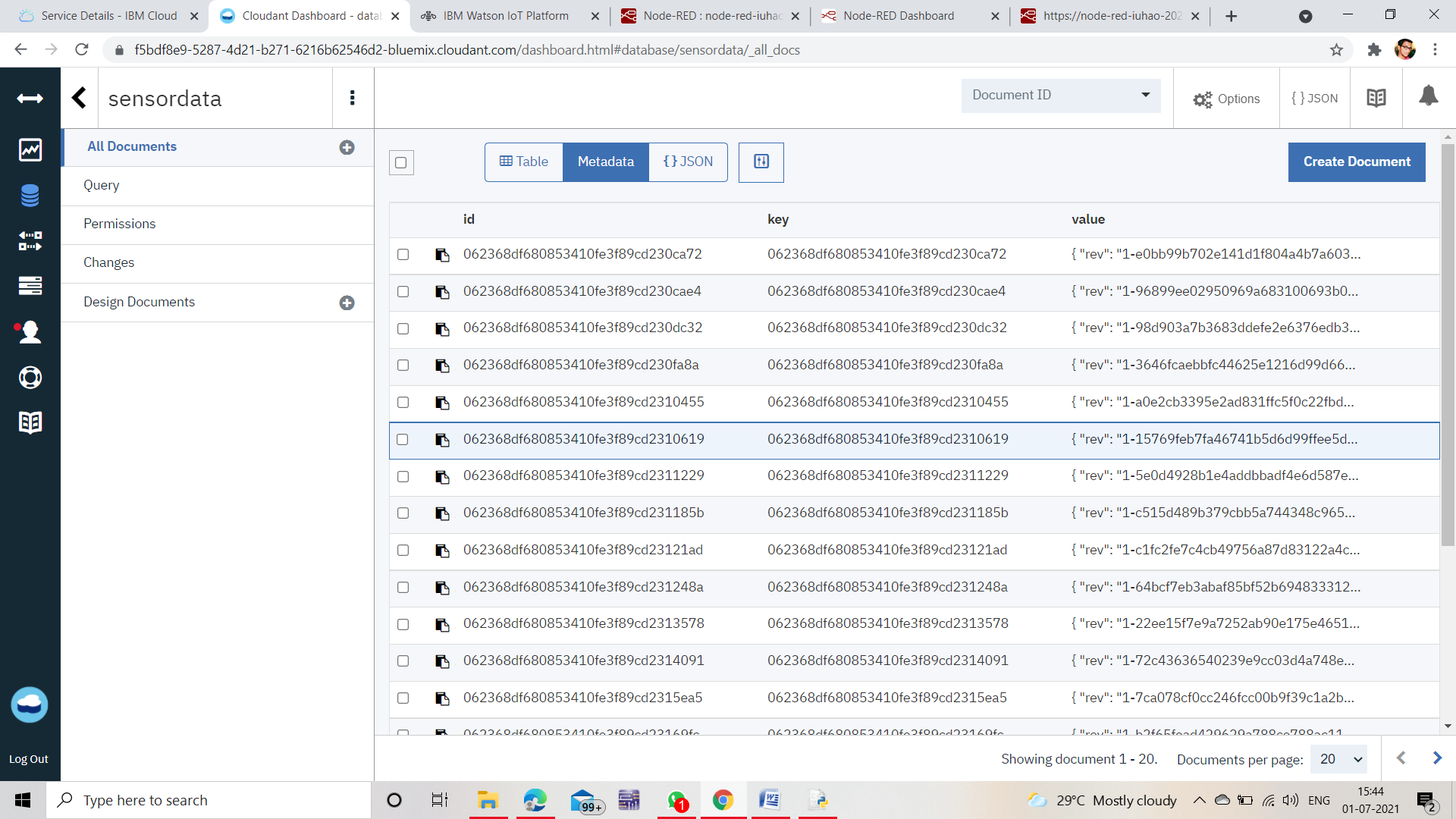
**Before hitting the url:**

****

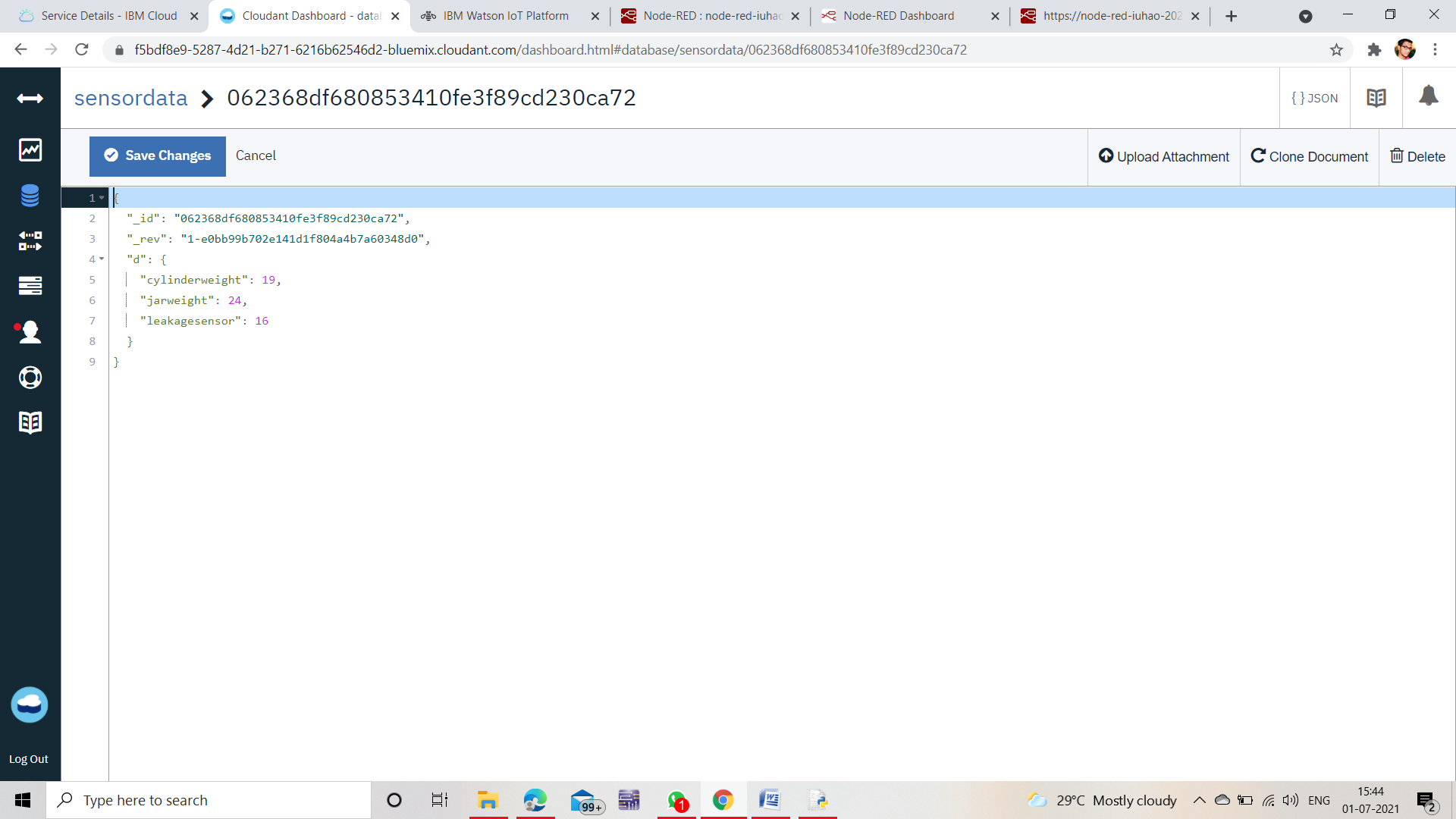
**After hitting the url:**

****

**Cloudant storage:(meta data)**

****

**Data storage in cloudant:**

****

**FLOW CHART**

**Initialize jar ,cylinder and leakage sensor values**

yes

**Alert of jar is empty**

**Jarwei<0**

no yes

**Cywei<0**

**Alert of cylinder isempty**

no

yes

Leak sensor>20

**Gas is leaking ,switch on fan**

**no**

**Result:**

The sensor data is received by the ibmplatform and the data is splited and visualized in ui interface(web application) and the app is designed to get the sensor values when we hit the url.

**Aplications:**

1. Monitoring the all sensors and its value for safty detection of gas leakage, temperature and Humidity of room,and daily usage of system to the user.

2. Exhaust fan switched on in case of abnormal readings

3. Stores the data related to the system like daily data monitoring Intelligent System for Domestic Gas Appliances using IOT. In our day-to-day life there is serious threat about leakage which leads to suffocation when inhaled, when ignited leads to explosion and causes a number of deaths. This project is about designing a LPG leakage monitoring system which is proposed for home safety. This system detects the leakage of the LPG and alerts the consumer about the leak by SMS and as an emergency measure the system will turnoff the power supply, while activating the alarm.

**CONCLUSION:**

Our Smart Kitchen using IoT system with multiregional sensors has been designed, constructed and tested. The result obtained from the tests carried out shows that the system is capable of sending SMS alerts whenever there is gas concentration at the inputs of the gas sensors. Hence this system can be used in homes and public buildings such as hotels and restaurants. Smart kitchen provides you all the automation features that include safety features over gas leakage detection system. For this we are using gas sensors, temperature sensors, weight sensors. Gas sensors are used to detect the leakage of a gas in the system, weight sensors are used to detect the weight of the gas cylinder. Temperature sensors are used to detect the current room temperature. Server stores information and related data are stored in it; it also stores the information about the hardware, sensors, and also maintains the logs and status of system, also stores the room temperature and information about the users. Threshold values are set into the room, when it crosses that values it will send a notification to the user, about the leakage of a gas cylinder and leakage of a gas. Server can communicate with the user through android device. Through email and SMS server can sends a notification to the user which will display on the android devices. It can prevent the accident and hazards. The only way to access the information is if the user is far from the home. It is a cost effective and time-consuming solution. We can use this in various applications like home automation,

**FUTURE WORK:**

One of the modifications is to provide the system with a dual power supply i.e. include a battery power supply source in addition to the utility power supply. Design the sensors that can be used for more kitchen parameters. Apply various techniques to make the system more secure. Also we can increase some sensors.

**BIBLOGRAPY**

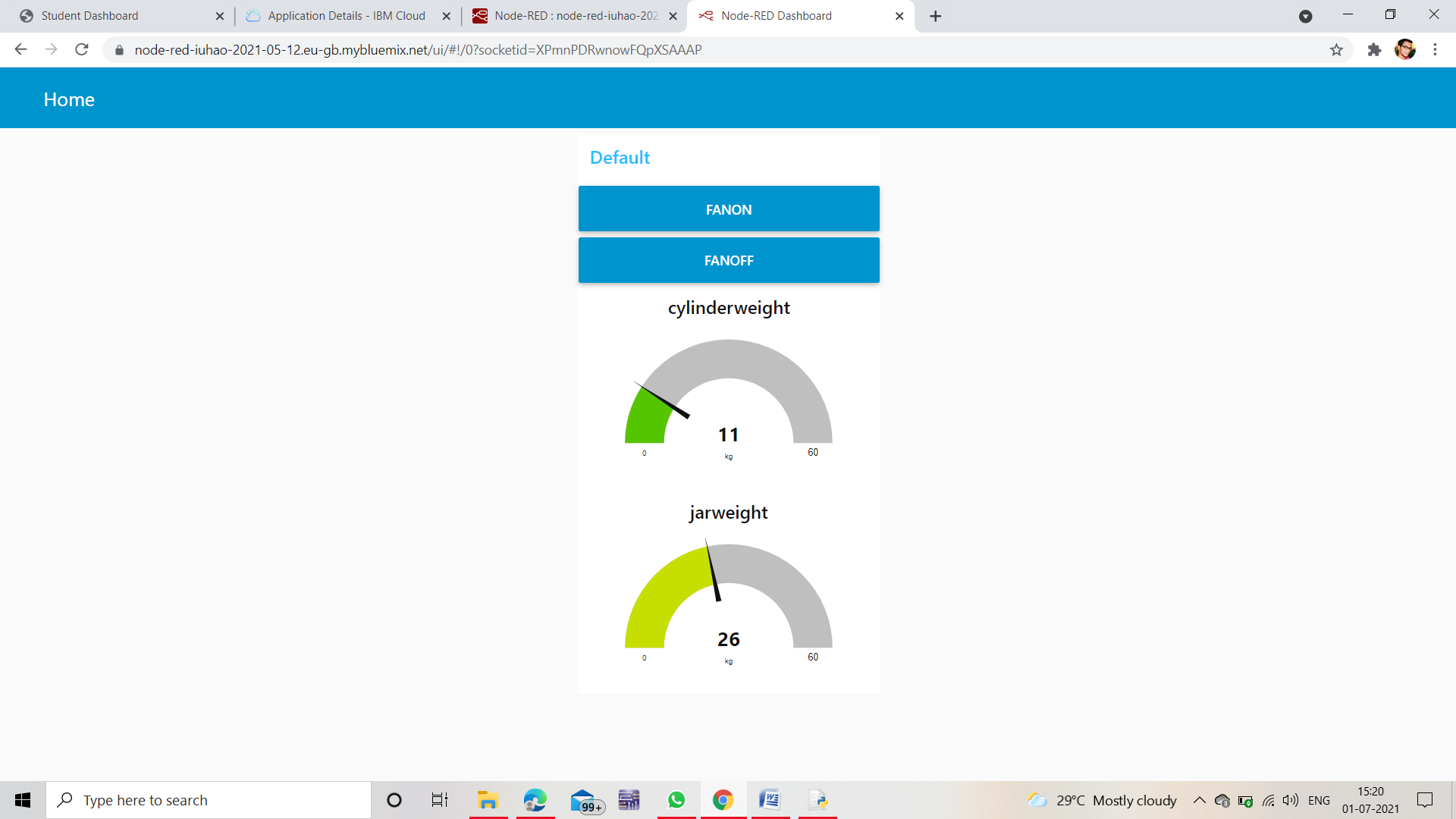
<http://www.ijcstjournal.org/volume-7/issue-2/IJCST-V7I2P4.pdf>

<https://www.researchgate.net/publication/326349806_Automation_and_Monitoring_Smart_Kitchen_Based_on_Internet_of_Things_IoT>

<http://ijarcet.org/wp-content/uploads/IJARCET-VOL-5-ISSUE-5-1297-1301.pdf>

Appendix:

**UI output screenshot:**

****