

# **SMART KITCHEN USING IBM CLOUD**

Category: Internet Of Things

BY-

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# **1.INTRODUCTION**

The global smart kitchen appliances market size was valued at USD 9.87 billion in 2019 and is anticipated to expand at a CAGR of 19.1% over the forecast period. Rising consumer disposable income and increasing technological trends such as Internet of Things enabled devices are spurring the market growth. Increasing adoption of smart kitchen appliances in residential as well as commercial sectors across the world is also one of the prominent factors driving the market growth.

## **2.PROJECT DESCRIPTION**

In this project we have created a model for a smart kitchen

The main features of this project are

### **1. Measuring the cylinder weight**

By measuring the cylinder weight we can identify the status of the cylinder, is the amount of lpg gas present in the cylinder is high, medium, and low. And if the cylinder becomes empty we will get an sms message stating that 'The cylinder is empty'.

### **2. Detecting the gas leakage in the cylinder**

Once the gas leakage is detected we will get an sms stating that 'There is a gas leakage in the cylinder'.

### **3.Measuring the jar weight(smart jar)**

By measuring the jar weight we can identify whether the jar is full, medium, or low. And if the jar is empty we will get an sms stating that 'The jar is empty'.

## **3.FEATURES**

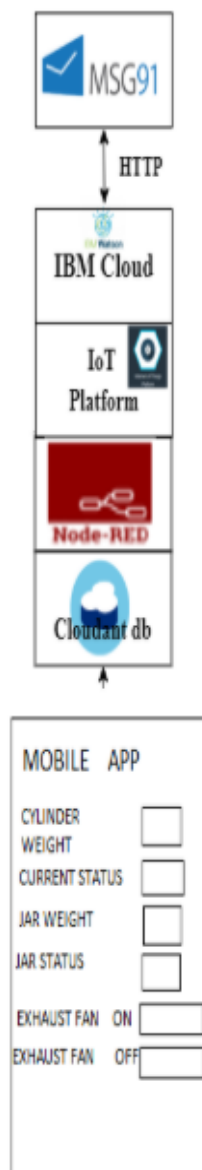
1.We can replace all the regular storage jars with the smart jars, which sends an alert when the jar gets empty or the measured sensor value is below the threshold.

2.These jars communicate with the controller through Nrf communication.

3.The cylinder is attached with a leakage sensor that detects the leakage from the cylinder and sends a notification if any leakage is detected.

- 4.If any leakage is detected the exhaust fans are automatically switched ON.
- 5.Cylinder weight is also measured and sends an alert when it is empty, based on the empty cylinder weight.
- 6.All these parameters can be monitored by both Mobile App and Web App.

## 4.BLOCK DAIGRAM



## **5.THE PYTHON IDLE CODE-**

```
import time
import sys
import ibmiotf.application
import ibmiotf.device
import requests
from cloudant.client import Cloudant
from cloudant.error import CloudantException
from cloudant.result import Result, ResultByKey
url = "https://www.fast2sms.com/dev/bulk"
#Provide your IBM Watson Device Credentials
organization = "kg0p6r"
deviceType = "raspberrypi"
deviceId = "project-15"
authMethod = "token"
authToken = "123456789"
def myCommandCallback(cmd):
    print("Command received: %s" % cmd.data)#Commands
    if cmd.data['command']=='exhauston':
        print("EXHAUST ON IS RECEIVED")
    elif cmd.data['command']=='exhaustoff':
        print("EXHAUST OFF IS RECEIVED")
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()
deviceCli.connect()
cylinder_weight=10
jar_weight=1000
```

```

cyl_empty=0
jar_empty=0
while True:
    cylinder_weight=cylinder_weight-1
    jar_weight=jar_weight-14
    if(cylinder_weight>0 and cylinder_weight<=3):
        current_status="low"
    elif(cylinder_weight>3 and cylinder_weight<=7):
        current_status="medium"
    elif(cylinder_weight>7 and cylinder_weight<=10):
        current_status="high"
    else:
        cylinder_weight=0
        status="empty"
        if(cyl_empty==0):
            querystring =
{"authorization":"CEBM7ZYzfkWlyPrtnmJNoH3xAGFLjhsX06ceg5UuiqQp2dS4RVMpPyG
0vdxQOq5N1ktTiLhrERac6wWU","sender_id":"FSTSMS","message":"The cylinder is
empty","language":"english","route":"p","numbers":"7541057457,9952162247,7530015671
,9500377352"}
            headers = {'cache-control': "no-cache"}
            response = requests.request("GET", url, headers=headers,
params=querystring)
            print(response.text)
            cyl_empty=1
        if(jar_weight>0 and jar_weight<=300):
            jar_status="low"
        elif(jar_weight>300 and jar_weight<=700):
            jar_status="medium"
        elif(jar_weight>700 and jar_weight<=1000):
            jar_status="high"
        else:
            jar_weight=0
            jar_status="empty"
            if(jar_empty==0):
                querystring =
{"authorization":"CEBM7ZYzfkWlyPrtnmJNoH3xAGFLjhsX06ceg5UuiqQp2dS4RVMpPyG

```

```
0vdxQOq5N1ktTiLhrERac6wWU","sender_id":"FSTSMS","message":"The jar is
```

```
empty","language":"english","route":"p","numbers":"7541057457,9952162247,7530015671,9500377352"}  
    headers = {'cache-control': "no-cache"}  
    response = requests.request("GET", url, headers=headers,  
params=querystring)  
    print(response.text)  
    jar_empty=1  
    gasleak=0  
    gasleak=gasleak+1  
    if(gasleak==40):  
        print('gas leak is detected')  
        querystring =  
{"authorization":"CEBM7ZYzfkWlyPrtnmJNoH3xAGFLjhsX06ceg5UiqQp2dS4RVMpPyG  
0vdxQOq5N1ktTiLhrERac6wWU","sender_id":"FSTSMS","message":"There is a gas  
leak","language":"english","route":"p","numbers":"7541057457,9952162247,7530015671,9  
500377352"}  
        headers = {'cache-control': "no-cache"}  
        response = requests.request("GET", url, headers=headers, params=querystring)  
        print(response.text)  
        jar_empty=1  
  
else:  
    print('no gas leak')  
  
    data =  
{'cylinder_weight':cylinder_weight,'jar_weight':jar_weight,'current_status':current_status,'ja  
r_status':jar_status}  
    #print (data)  
    def myOnPublishCallback():  
        print ("Published cylinder_weight = %s " % cylinder_weight, "jar_weight = %s " %  
jar_weight, "current_status = %s" % current_status,"jar_status = %s" % jar_status, "to IBM  
Watson")  
        success = deviceCli.publishEvent("smart_kitchen", "json", data, qos=0,
```

```

on_publish=myOnPublishCallback)
    if not success:
        print("Not connected to IoT")
    time.sleep(2)
    deviceCli.commandCallback = myCommandCallback
    client = Cloudant("fcf055c3-9b00-418e-a955-a88fd70d32d0-bluemix",
"a10a022499db0fcd47dce369b941bb895d640c859923fae1fd2806ea5cbe4721",url="http://fcf055c3-9b00-418e-a955-a88fd70d32d0-bluemix:a10a022499db0fcd47dce369b941bb895d640c859923fae1fd2806ea5cbe4721@fcf055c3-9b00-418e-a955-a88fd70d32d0-bluemix.cloudantnosqldb.appdomain.cloud")
    client.connect()
    database_name = "project15"
    my_database = client.create_database(database_name)
    if my_database.exists():
        print(f"{database_name}' successfully created.")

record_data={'cylinder_weight':cylinder_weight,'jar_weight':jar_weight,'current_status':current_status,'jar_status':jar_status}
    new_document = my_database.create_document(record_data)
    if new_document.exists():
        print(f"Document successfully created.")
    result_collection = Result(my_database.all_docs,include_docs=True)
    print(f"Retrieved minimal document:\n{result_collection[0]}\n")

# Disconnect the device and application from the cloud
deviceCli.disconnect()

```

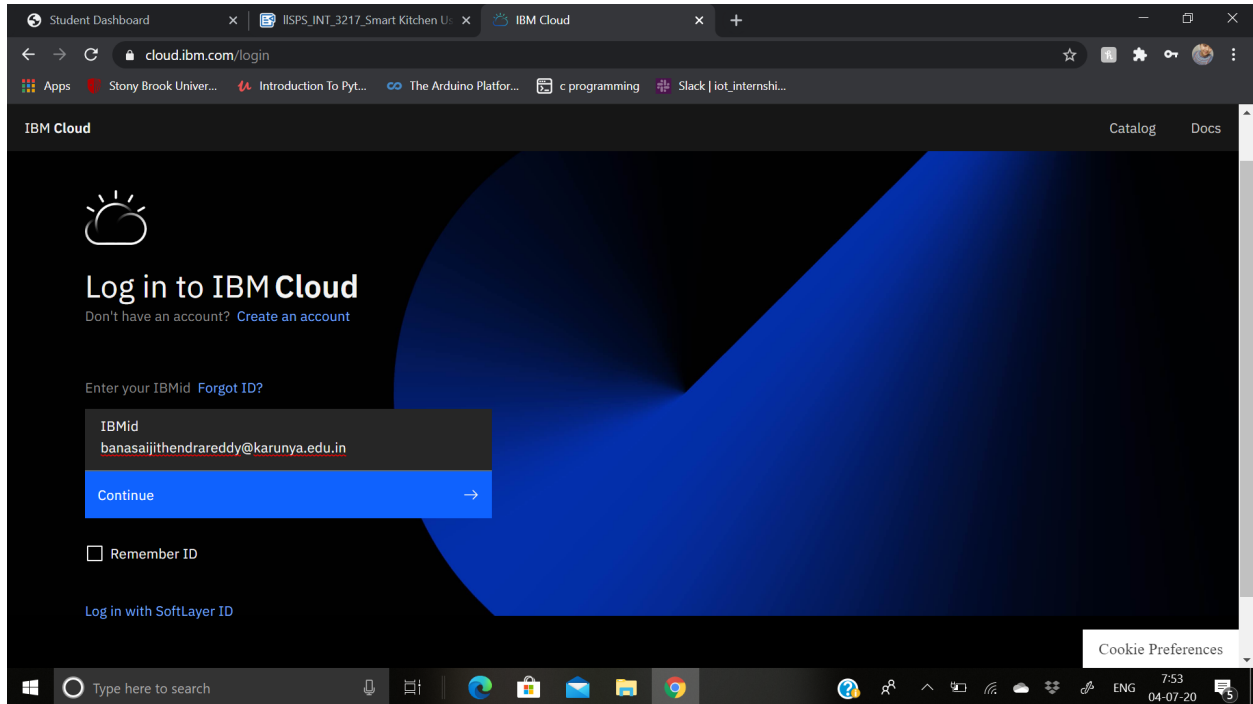
THE LINK TO NODE RED-

[https://node-red-uodf.eu-gb.mybluemix.net/?\\_ga=2.152525369.141832829.1593542549-94931584.1593542549](https://node-red-uodf.eu-gb.mybluemix.net/?_ga=2.152525369.141832829.1593542549-94931584.1593542549)



## 6.WEB APPLICATION

### CREATING IBM CLOUD SERVICES-



Student Dashboard x IISPS\_INT\_3217\_Smart Kitchen U... x IBM Cloud x +

cloud.ibm.com

Apps Stony Brook Univer... Introduction To Pyt... The Arduino Platfor... c programming Slack | iot\_internshi...

IBM Cloud Search resources and offerings... Catalog Docs Support Manage Jithendra Redd...

## Dashboard

Upgrade Customize Create resource +

### Resource summary

8 Resources

Cloud Foundry apps	1
Cloud Foundry services	1
Services	3
Apps	1
Developer tools	2

Add resources +

### Planned maintenance

View all

Clear skies!  
You can view your scheduled maintenance events here.

### For you

News View all

### Recent support cases

View all

Type here to search

Student Dashboard x IISPS\_INT\_3217\_Smart Kitchen U... x Resource list - IBM Cloud x +

cloud.ibm.com/resources

Apps Stony Brook Univer... Introduction To Pyt... The Arduino Platfor... c programming Slack | iot\_internshi...

IBM Cloud Search resources and offerings... Catalog Docs Support Manage Jithendra Redd...

Filter by name or IP address... Filter by group or org... Filter... Filter... Filter...

Devices (0)	
VPC infrastructure (0)	
Clusters (0)	
Cloud Foundry apps (1)	
Node RED UOEDF	banasaijithendrareddy@karunya.edu... London Started
Cloud Foundry services (1)	
node-red-uodf-cloudant-159370908...	banasaijithendrareddy@karunya.edu... London Provisioned
Services (3)	
Continuous Delivery	Default London Active
Internet of Things Platform-d5	Default London Active
node-red-uodf-cloudant-159370908...	Default London Active
Storage (0)	

Type here to search

Student Dashboard | IISPS\_INT\_3217\_Smart Kitchen U... | Resource list - IBM Cloud

cloud.ibm.com/resources

Apps | Stony Brook Univer... | Introduction To Pyt... | The Arduino Platfor... | c programming | Slack | iot\_internshi...

IBM Cloud | Search resources and offerings... | Catalog | Docs | Support | Manage | Jithendra Redd...

Filter by name or IP address... | Filter by group or org... | Filter... | Filter... | Filter...

Services (3)

Internet of Things Platform-d5	Default	London	Active	—	
node-red-uoedf-cloudant-159370908...	Default	London	Active	—	

Storage (0)

Network (0)

Cloud Foundry enterprise environments (0)

Functions namespaces (0)

Apps (1)

Node RED UOEDF	Default	Global	—	—	
----------------	---------	--------	---	---	--

Developer tools (2)

VMware (0)

Schematics workspaces (0)

FEEDBACK

Type here to search | 7:54 04-07-20

Student Dashboard | IISPS\_INT\_3217\_Smart Kitchen U... | Service Details - IBM Cloud

cloud.ibm.com/services/cloudantnosqldb/crn%3Av1%3Abluemix%3Apublic%3Acloudantnosqldb%3Aeu-gb%3Aa%2Fc631c79eedc144b2a0a3d72423747a...

Apps | Stony Brook Univer... | Introduction To Pyt... | The Arduino Platfor... | c programming | Slack | iot\_internshi...

IBM Cloud | Search resources and offerings... | Catalog | Docs | Support | Manage | Jithendra Redd...

Resource list / node-red-uoedf-cloudant-1593709087173 Active Add tags Details Actions...

Manage | Overview | Dashboard | Capacity | Docs | Launch Dashboard

Service credentials | Plan | Connections

CRN crn:v1:bluemix:public:cloudantnosqldb:eu-gb:a/c631c79eedc144b2a0a3d72423747a5d:92cf3f45-1f2d-4474-9008-8327181dd1b0::

Location London

External Endpoint <https://fcf055c3-9b00-418e-a955-a88fd70d32d0-bluemix.cloudant.com>

External Endpoint (preferred) <https://fcf055c3-9b00-418e-a955-a88fd70d32d0-bluemix.cloudantnosqldb.appdomain.cloud>

Authentication methods IBM Cloud IAM and Cloudant credentials

Activity Tracker event types Management Save

FEEDBACK

Type here to search | 7:54 04-07-20



**IBM Watson IoT Platform**

banasaijithendrareddy@karunya.edu.in  
ID: kg0p6r

**Browse Devices**

All Devices Diagnose

This table shows a summary of all devices that have been added. It can be filtered, organized, and searched on using different criteria. To get started, you can add devices by using the Add Device button, or by using API.

Search by Device ID

Device Simulator

Device ID	Status	Device Type	Class ID	Date Added
project-15	Connected	raspberrypi	Device	1 Jul 2020 13:13

Items per page 50 | 1-1 of 1 item

1 of 1 page

Cookie Preferences

FOR STORING THE DATAS IN THE CLOUD -

**IBM Watson IoT Platform**

banasaijithendrareddy@karunya.edu.in  
ID: kg0p6r

**Device Drilldown - project-15**

← Back

Recent Events

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
smart_kitchen	{"cylinder_weight":0,"jar_weight":664,"current_s...	json	a few seconds ago
smart_kitchen	{"cylinder_weight":0,"jar_weight":678,"current_s...	json	a few seconds ago
smart_kitchen	{"cylinder_weight":0,"jar_weight":692,"current_s...	json	a few seconds ago
smart_kitchen	{"cylinder_weight":0,"jar_weight":706,"current_s...	json	a few seconds ago
smart_kitchen	{"cylinder_weight":0,"jar_weight":720,"current_s...	json	a few seconds ago

Cookie Preferences

Service Details - IBM Cloud Cloudant Dashboard IBM Watson IoT Platform Cloudant Dashboard

fcf055c3-9b00-418e-a955-a88fd70d32d0-bluemix.cloudant.com/dashboard.html

Apps Baba Ghulam Shah... YouTube Gmail

## Databases

Database name Create Database {} JSON

### Your Databases

Name	Size	# of Docs	Partitioned	Actions
nodereduodf	69.9 KB	4	No	
project15	107.6 KB	317	No	

Showing 1-2 of 2 databases. Databases per page 20 1

Log Out

Service Details - IBM Cloud Cloudant Dashboard - data IBM Watson IoT Platform Cloudant Dashboard

fcf055c3-9b00-418e-a955-a88fd70d32d0-bluemix.cloudant.com/dashboard.html#database/project15/\_all\_docs

Apps Baba Ghulam Shah... YouTube Gmail

## project15

Document ID Options {} JSON

All Documents Query Permissions Changes Design Documents

Table Metadata {} JSON Create Document

id	key	value
0dc1d262adeb54e92c0bf626b0...	0dc1d262adeb54e92c0bf626b0...	{"rev": "1-2bc6113c87a527b9f..."}
0dc1d262adeb54e92c0bf626b0...	0dc1d262adeb54e92c0bf626b0...	{"rev": "1-ee5fe1df2a4068a1cd..."}
0dc1d262adeb54e92c0bf626b0...	0dc1d262adeb54e92c0bf626b0...	{"rev": "1-1a7b4c19571bb072b..."}
11e7b3768fca7fc8f18539792c...	11e7b3768fca7fc8f18539792c...	{"rev": "1-d70aedff3a37148427..."}
11e7b3768fca7fc8f18539792c...	11e7b3768fca7fc8f18539792c...	{"rev": "1-d70aedff3a37148427..."}
11e7b3768fca7fc8f18539792c...	11e7b3768fca7fc8f18539792c...	{"rev": "1-d70aedff3a37148427..."}
11e7b3768fca7fc8f18539792c...	11e7b3768fca7fc8f18539792c...	{"rev": "1-513fbf3a68809de219..."}
11e7b3768fca7fc8f18539792c...	11e7b3768fca7fc8f18539792c...	{"rev": "1-347dd2c2b48621979..."}
11e7b3768fca7fc8f18539792c...	11e7b3768fca7fc8f18539792c...	{"rev": "1-755392c42d68ffe956..."}

Showing document 1 - 20. Documents per page: 20

Log Out

Browser tabs: New Tab, Service Details - IBM Cloud, Cloudant Dashboard - data, IBM Watson IoT Platform, Cloudant Dashboard

Address bar: [fcf055c3-9b00-418e-a955-a88fd70d32d0-bluemix.cloudant.com/dashboard.html#database/project15/0dc1d262adeb54e92c0bf626b061f644](https://fcf055c3-9b00-418e-a955-a88fd70d32d0-bluemix.cloudant.com/dashboard.html#database/project15/0dc1d262adeb54e92c0bf626b061f644)

Navigation: Apps, Baba Ghulam Shah..., YouTube, Gmail

Project: project15 > 0dc1d262adeb54e92c0bf626b061f644 [JSON] [Book] [Bell]

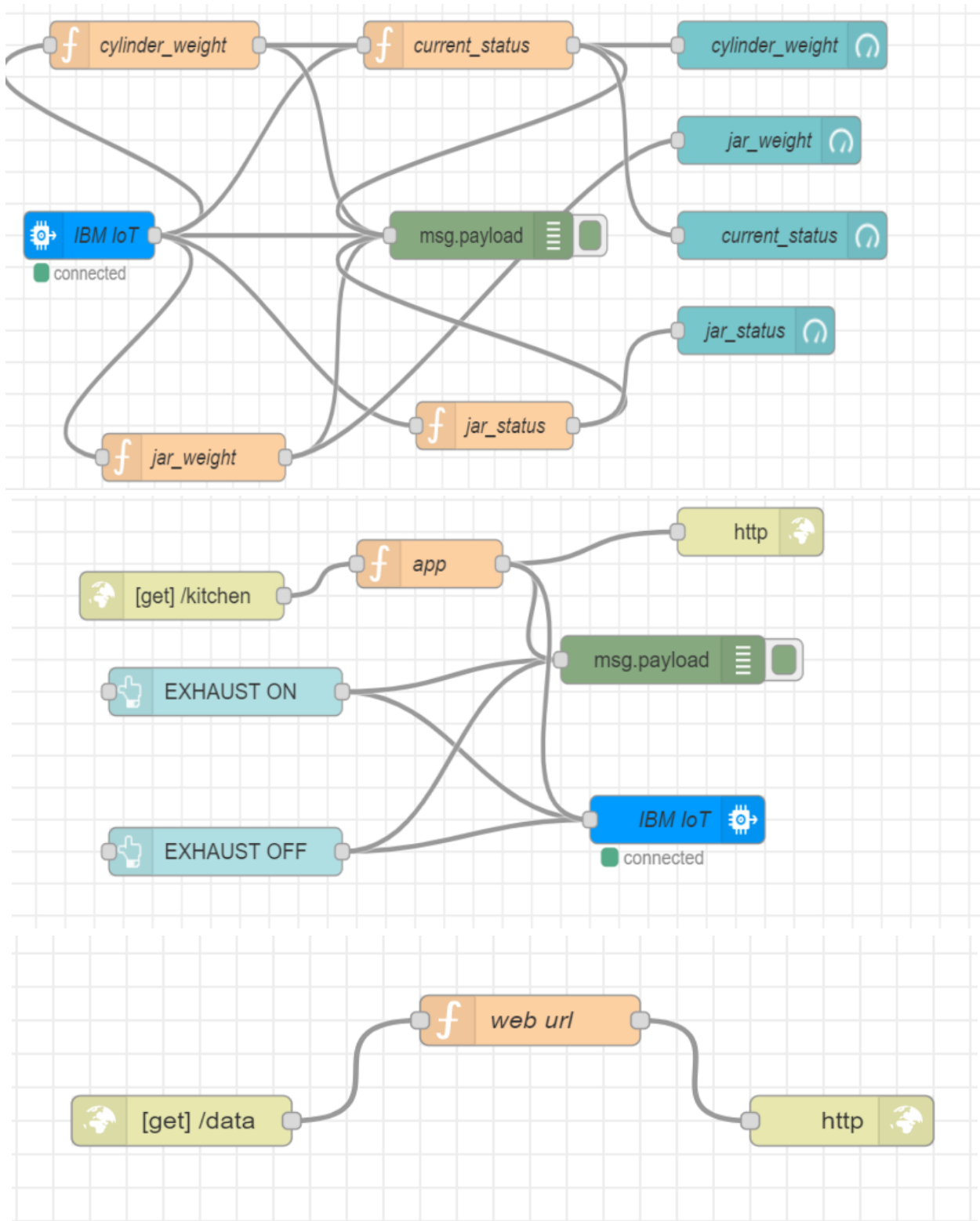
Actions: Save Changes, Cancel, Upload Attachment, Clone Document, Delete

```
1 {
2   "_id": "0dc1d262adeb54e92c0bf626b061f644",
3   "_rev": "1-2bc6113c87a527b9f72f4c7fbc3e12a8",
4   "cylinder_weight": 8,
5   "jar_weight": 972,
6   "current_status": "high",
7   "jar_status": "high"
8 }
```

Log Out

Windows taskbar: 20:21, 03-07-2020, ENG

## 7. NODE RED FLOW-





## 8. THE NODE RED SOURCE CODE

```
{{"id":"ef8b0c47.89464","type":"tab","label":"Flow
1","disabled":false,"info":"","{"id":"d6ba6dcc.080b4","type":"ibmiot
in","z":"ef8b0c47.89464","authentication":"apiKey","apiKey":"a0757bc6.3ac788","inputType":
:"evt","logicalInterface":"","ruleId":"","deviceId":"project-15","applicationId":"","deviceType":"ra
spberrypi","eventType":"smart_kitchen","commandType":"","format":"json","name":"IBM
IoT","service":"registered","allDevices":"","allApplications":"","allDeviceTypes":"","allLogicallyIn
terfaces":"","allEvents":"","allCommands":"","allFormats":"","qos":0,"x":70,"y":160,"wires":[["a6
6564a4.8f1fa8","a91f2b53.663ca8","39c79dcb.457bd2","38ccb347.3acd8c","8c332a56.df
1628"]]},{"id":"a66564a4.8f1fa8","type":"debug","z":"ef8b0c47.89464","name":"","active":true
,"tosidebar":true,"console":false,"tostatus":false,"complete":"payload","targetType":"msg","s
tatusVal":"","statusType":"auto","x":370,"y":160,"wires":[]},{"id":"a91f2b53.663ca8","type":"fu
nction","z":"ef8b0c47.89464","name":"cylinder_weight","func":"global.set('cylinder_weight',
msg.payload.cylinder_weight)\nmsg.payload=msg.payload.cylinder_weight\nreturn
msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","x":120,"y":40,"wires":[["a66564a4.8f1fa8
","e5cd5746.d40e78"]]},{"id":"39c79dcb.457bd2","type":"function","z":"ef8b0c47.89464","na
me":"jar_weight","func":"global.set('jar_weight',msg.payload.jar_weight)\nmsg.payload=
msg.payload.jar_weight\nreturn
msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","x":150,"y":300,"wires":[["a66564a4.8f1fa
8","36d098ac.05e038"]]},{"id":"8c332a56.df1628","type":"function","z":"ef8b0c47.89464","n
ame":"jar_status","func":"global.set('jar_status',msg.payload.jar_status)\nmsg.payload=
msg.payload.jar_status\nreturn
msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","x":380,"y":280,"wires":[["a66564a4.8f1fa
8","29e4490.d62d3b8"]]},{"id":"38ccb347.3acd8c","type":"function","z":"ef8b0c47.89464","n
ame":"current_status","func":"global.set('current_status',msg.payload.current_status)\nms
sg.payload=msg.payload.current_status\nreturn
msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","x":360,"y":40,"wires":[["a66564a4.8f1fa8
","73a29b42.0ad7b4"]]},{"id":"e5cd5746.d40e78","type":"ui_gauge","z":"ef8b0c47.89464","n
ame":"cylinder_weight","group":"19324344.bd6a0d","order":0,"width":0,"height":0,"gtype":"d
onut","title":"cylinder_weight","label":"kilograms","format":"{{value}}","min":0,"max":"100","co
lors":["#00b500","#e6e600","#ca3838"],"seg1":"","seg2":"","x":600,"y":40,"wires":[]},{"id":"36d0
98ac.05e038","type":"ui_gauge","z":"ef8b0c47.89464","name":"jar_weight","group":"3e78b3
30.9f7a4c","order":1,"width":0,"height":0,"gtype":"gage","title":"jar_weight","label":"grams","fo
rmat":"{{value}}","min":0,"max":"1000","colors":["#00b500","#e6e600","#ca3838"],"seg1":"","s
eg2":"","x":590,"y":100,"wires":[]},{"id":"73a29b42.0ad7b4","type":"ui_gauge","z":"ef8b0c47.8
```

```

9464","name":"current_status","group":"4e84342a.77d52c","order":0,"width":0,"height":0,"gt
ype":"gage","title":"current_status","label":"kilograms","format":"{{value}}","min":0,"max":10
0,"colors":["#00b500","#e6e600","#ca3838"],"seg1":"","seg2":"","x":600,"y":160,"wires":[]},{
id":"29e4490.d62d3b8","type":"ui_gauge","z":"ef8b0c47.89464","name":"jar_status","group":"
33a94f0e.61524","order":0,"width":0,"height":0,"gtype":"gage","title":"jar_status","label":"gra
ms","format":"{{value}}","min":0,"max":1000,"colors":["#00b500","#e6e600","#ca3838"],"se
g1":"","seg2":"","x":580,"y":220,"wires":[]},{id":"8e29eb85.d67248","type":"ui_button","z":"ef8b
0c47.89464","name":"","group":"bd555a02.900608","order":0,"width":0,"height":0,"passthru":
false,"label":"EXHAUST
ON","tooltip":"","color":"","bgcolor":"","icon":"","payload":"{\\command\\:\\exhauston\\}","payl
oadType":"str","topic":"","x":210,"y":440,"wires":[["58c1fd64.2c9984","1a95e5e9.f66bca"]]},{"
id":"bd6a9ffb.3c311","type":"ui_button","z":"ef8b0c47.89464","name":"","group":"84947f66.
e35c9","order":0,"width":0,"height":0,"passthru":false,"label":"EXHAUST
OFF","tooltip":"","color":"","bgcolor":"","icon":"","payload":"{\\command\\:\\exhauston\\}","payl
oadType":"str","topic":"","x":210,"y":540,"wires":[["58c1fd64.2c9984","1a95e5e9.f66bca"]]},{"
id":"58c1fd64.2c9984","type":"ibmiot
out","z":"ef8b0c47.89464","authentication":"apiKey","apiKey":"a0757bc6.3ac788","outputTy
pe":"evt","deviceId":"project-15","deviceType":"raspberrypi","eventCommandType":"smart_k
itchen","format":"json","data":"blink","qos":0,"name":"IBM
IoT","service":"registered","x":520,"y":520,"wires":[]},{id":"1a95e5e9.f66bca","type":"debug",
z":"ef8b0c47.89464","name":"","active":true,"tosidebar":true,"console":false,"tostatus":false,
"complete":false,"statusVal":"","statusType":"auto","x":510,"y":420,"wires":[]},{id":"b68d548
7.a08c48","type":"http
in","z":"ef8b0c47.89464","name":"","url":"/data","method":"get","upload":false,"swaggerDoc":
"",x":210,"y":680,"wires":[["319d53be.99b6bc"]]},{"id":"fc447542.5ea888","type":"http
response","z":"ef8b0c47.89464","name":"","statusCode":"","headers":{},"x":570,"y":680,"wires
":[]},{id":"319d53be.99b6bc","type":"function","z":"ef8b0c47.89464","name":"web
url","func":"msg.payload={\\cylinder_weight\\:global.get(\\cylinder_weight\\),\\current_st
atus\\:global.get(\\current_status\\),\\jar_weight\\:global.get(\\jar_weight\\),\\jar_status
\\:global.get(\\jar_status\\)}\\nreturn
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```

```
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dth":"6","collapse":false},{"id":"4e84342a.77d52c","type":"ui_group","z":"","name":"current_st  
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","icon":"dashboard","disabled":false,"hidden":false}]
```

## 9.WEB APPLICATION USER INTERFACE

User Interface (UI) Design focuses on anticipating what users might need to do and ensuring that the interface has elements that are easy to access, understand, and use to facilitate those actions. UI brings together concepts from interaction design, visual design, and information architecture.

### Choosing Interface Elements

Users have become familiar with interface elements acting in a certain way, so try to be consistent and predictable in your choices and their layout. Doing so will help with task completion, efficiency, and satisfaction.

Interface elements include but are not limited to:

- **Input Controls:** buttons, text fields, checkboxes, radio buttons, dropdown lists, list boxes, toggles, date field
- **Navigational Components:** breadcrumb, slider, search field, pagination, slider, tags, icons
- **Informational Components:** tooltips, icons, progress bar, notifications, message boxes, modal windows
- **Containers:** accordion

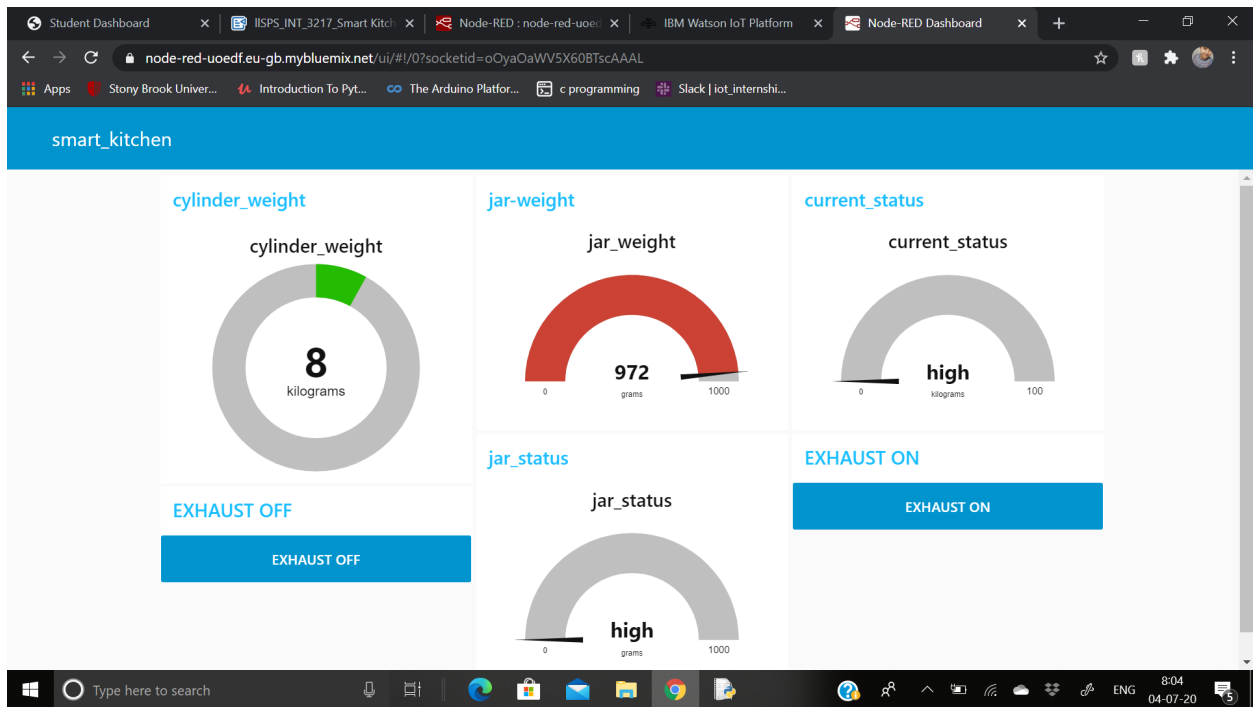
There are times when multiple elements might be appropriate for displaying content. When this happens, it's important to consider the trade-offs. For example, sometimes elements that can help save you space, put more of a burden on the user mentally by forcing them to guess what is within the dropdown or what the element might be.

### Best Practices for Designing an Interface

Everything stems from knowing your users, including understanding their goals, skills, preferences, and tendencies. Once you know about your user, make sure to consider

the following when designing your interface:

- **Keep the interface simple.** The best interfaces are almost invisible to the user. They avoid unnecessary elements and are clear in the language they use on labels and in messaging.
- **Create consistency and use common UI elements.** By using common elements in your UI, users feel more comfortable and are able to get things done more quickly. It is also important to create patterns in language, layout and design throughout the site to help facilitate efficiency. Once a user learns how to do something, they should be able to transfer that skill to other parts of the site.
- **Be purposeful in page layout.** Consider the spatial relationships between items on the page and structure the page based on importance. Careful placement of items can help draw attention to the most important pieces of information and can aid scanning and readability.
- **Strategically use color and texture.** You can direct attention toward or redirect attention away from items using color, light, contrast, and texture to your advantage.
- **Use typography to create hierarchy and clarity.** Carefully consider how you use typeface. Different sizes, fonts, and arrangement of the text to help increase scanability, legibility and readability.
- **Make sure that the system communicates what's happening.** Always inform your users of location, actions, changes in state, or errors. The use of various UI elements to communicate status and, if necessary, next steps can reduce frustration for your user.
- **Think about the defaults.** By carefully thinking about and anticipating the goals people bring to your site, you can create defaults that reduce the burden on the user. This becomes particularly important when it comes to form design where you might have an opportunity to have some fields pre-chosen or filled out.



```
{"cylinder_weight":0,"current_status":"low","jar_weight":818,"jar_status":"high"}
```

## **10.MIT APP INVENTER**

MIT App Inventor is a web application integrated development environment originally provided by Google, and now maintained by the Massachusetts Institute of Technology (MIT). It allows newcomers to computer programming to create application software(apps) for two operating systems (OS): Android, and iOS, which, as of 8 July 2019, is in final beta testing. It is free and open-source software released under dual licensing: a Creative Commons Attribution ShareAlike 3.0 Unported license, and an Apache License 2.0 for the source code.

It uses a graphical user interface (GUI) very similar to the programming languages Scratch (programming language) and the StarLogo, which allows users to drag and drop visual objects to create an application that can run on android devices, while a App-Inventor Companion (The program that allows the app to run and debug on) that works on iOS running devices are still under development. In creating App Inventor, Google drew upon significant prior research in educational computing, and work done within Google on online development environments.

App Inventor and the other projects are based on and informed by constructionist learning theories, which emphasize that programming can be a vehicle for engaging powerful ideas through active learning. As such, it is part of an ongoing movement in computers and education that began with the work of Seymour Papert and the MIT Logo Group in the 1960s, and has also manifested itself with Mitchel Resnick's work on Lego Mindstorms and StarLogo.

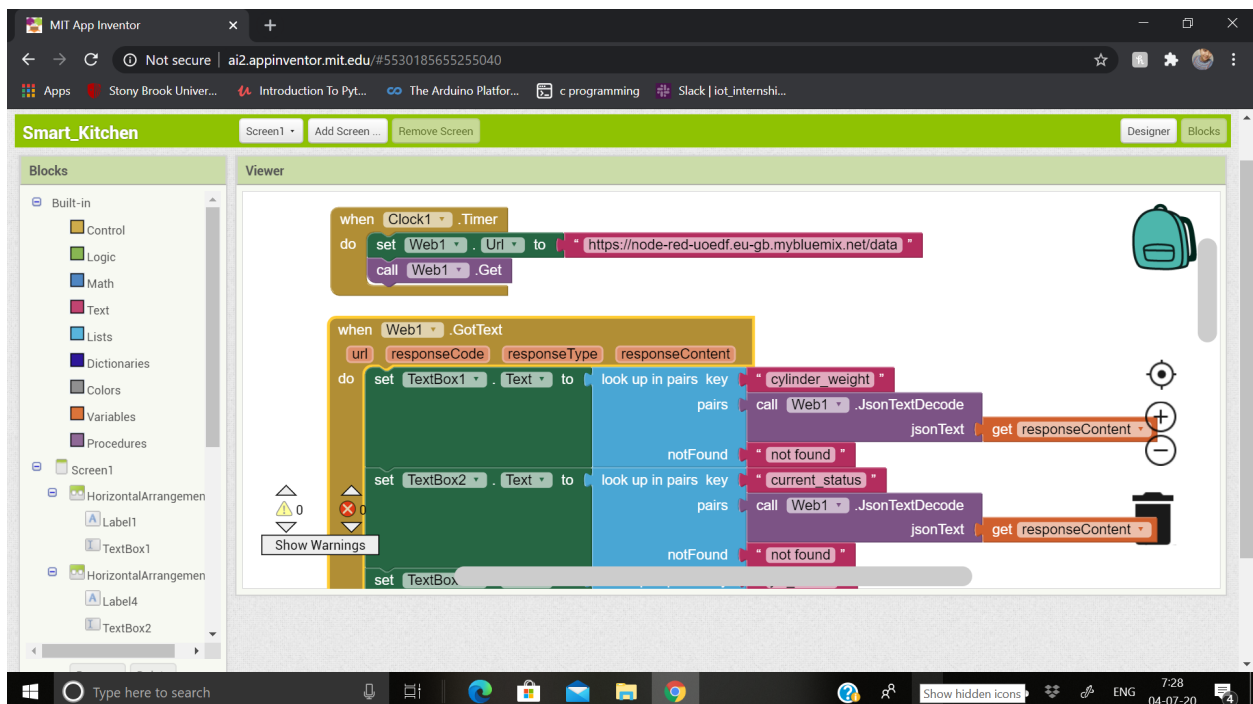
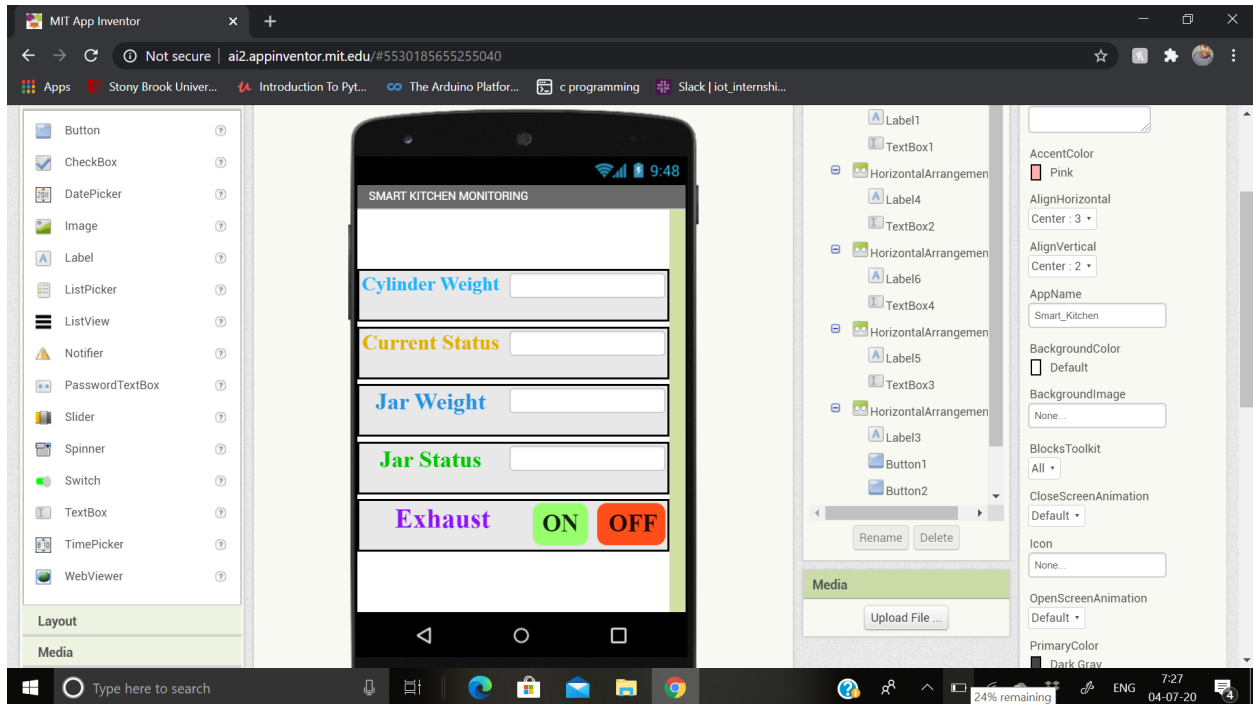
App Inventor also supports the use of cloud data via an experimental Firebase#Firebase Realtime Database component.

So in our project we have mad a mobile app to monitor the status of the components present in the kitchen. The following are the option which will be vivible in the mobile app:

1. Cylinder weight
2. Current status
3. Jar weight
4. Jar status
5. Exhaust - ON / OFF

So it is not necessary to use the web application to access the smart kitchen everytime.It can be used through the phone also.

The screenshots of the app is given below-







## 12.THE PYTHON IDE OUTPUT:-

```
Python 3.7.7 Shell
File Edit Shell Debug Options Window Help

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no gas leak
Published cylinder_weight = 0 jar_weight = 0 current_status = low jar_status = empty to IRM Watson
'project15' successfully created.
Document successfully created.
Retrieved minimal document:
[['_id': '0dcld262adeb54e92c0bf626b061f644', 'key': '0dcld262adeb54e92c0bf626b061f644', 'value': {'_rev': '1-2bc6113c87a527b9f72f4c7fbc3e12a8'}], ['_id': '0dcld262adeb54e92c0bf626b061f644', '_rev': '1-2bc6113c87a527b9f72f4c7fbc3e12a8', 'cylinder_weight': 8, 'jar_weight': 972, 'current_status': 'high', 'jar_status': 'high''}]]

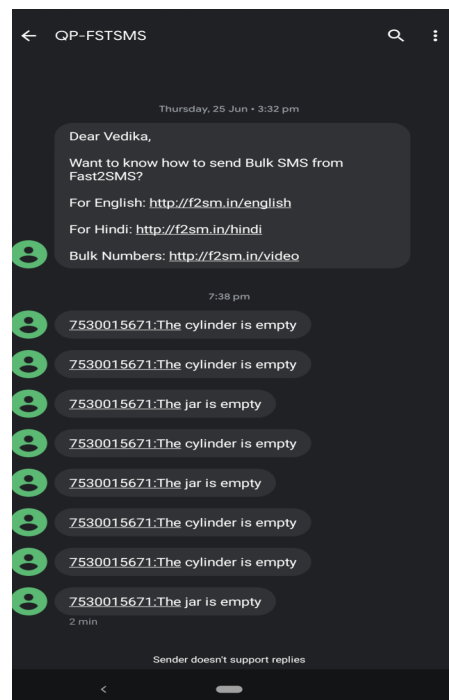
no gas leak
Published cylinder_weight = 0 jar_weight = 0 current_status = low jar_status = empty to IRM Watson
'project15' successfully created.
Document successfully created.
Retrieved minimal document:
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no gas leak
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[['_id': '0dcld262adeb54e92c0bf626b061f644', 'key': '0dcld262adeb54e92c0bf626b061f644', 'value': {'_rev': '1-2bc6113c87a527b9f72f4c7fbc3e12a8'}], ['_id': '0dcld262adeb54e92c0bf626b061f644', '_rev': '1-2bc6113c87a527b9f72f4c7fbc3e12a8', 'cylinder_weight': 8, 'jar_weight': 972, 'current_status': 'high', 'jar_status': 'high''}]]

no gas leak
Published cylinder_weight = 0 jar_weight = 0 current_status = low jar_status = empty to IRM Watson
'project15' successfully created.
Document successfully created.
Retrieved minimal document:
[['_id': '0dcld262adeb54e92c0bf626b061f644', 'key': '0dcld262adeb54e92c0bf626b061f644', 'value': {'_rev': '1-2bc6113c87a527b9f72f4c7fbc3e12a8'}], ['_id': '0dcld262adeb54e92c0bf626b061f644', '_rev': '1-2bc6113c87a527b9f72f4c7fbc3e12a8', 'cylinder_weight': 8, 'jar_weight': 972, 'current_status': 'high', 'jar_status': 'high''}]]

no gas leak
Published cylinder_weight = 0 jar_weight = 0 current_status = low jar_status = empty to IRM Watson
```

## 13.THE MESSAGE OUTPUT



## **14.ADVANTAGES AND DISADVANTAGES**

### **ADVANTAGES**

1. Smart appliances can make life easier
2. They look cool
3. Convenience
4. Less worry when your in a vacation
5. cooking becomes easier
6. Saftey

### **DISADVANTAGES**

1. Smart appliances cost more
2. Utilizes resource to build
3. More technical security threats

## **15. CONCLUSION**

Our system will detect the leakage of the gas, incase there is any leakage it will send a sms to the owner and it will turn on exhaust fan on. The system will continuously monitor the weight of the lpg gas and the weight of the jar .

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