SMART KITCHEN USING IBM CLOUD

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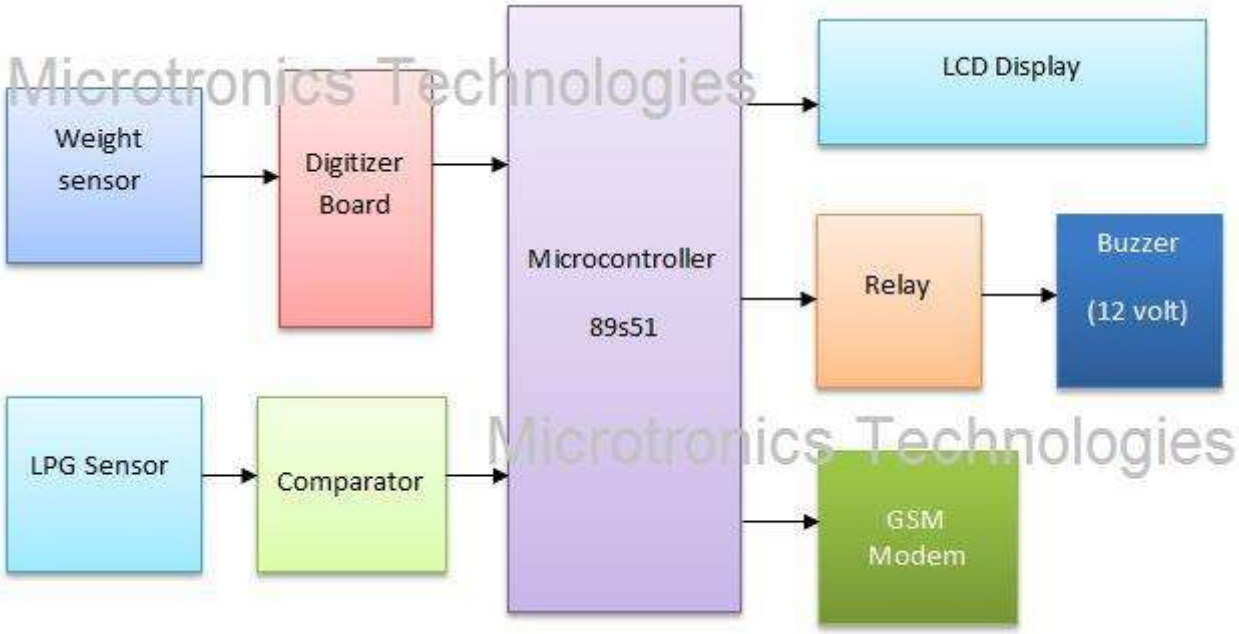
on

INTERNET OF THINGS

INTRODUCTION

Abstract— Now a days, things are changing rapidly in the world. Many machines are developed which made human life easier. Now, peoples are so much busy in their work. People think that there should be a technology that will reduce their work load. Internet of Thing fulfils this requirement of people. People regularly go in kitchen for cooking the food. But it will become a dangerous situation if there is leakage in gas cylinder. Our aim is to reduce the risks in Kitchen using Internet of Things. We proposed the design and construction of an SMS based Gas Leakage Alert System. Gas sensor were used to detect gas leakages in a kitchen; its outputs are then interfaced with an ATmega32 microcontroller programmed in assembly language. The GSM phone is configured to send gas leakage alerts in the form of a short message service (SMS). We can get this and much more safety feature that can be integrated with the automation system includes temperature sensor, weight sensor. Our system provides results in the form of SMS. The system enables monitoring of gas leakages in kitchen and thereby leads to a faster response time in the events of a leakage condition.

Index Terms— Gas leaks, gas sensors, temperature sensors, weight sensors, microcontroller, SMS alert



Requirements:

software:

Arduino IDE
IBM Cloud Account
IBM IOT Platform
MIT App Inventor
NOdeRed

Hardware:

16 *2 LCD Display
GSM module
LPG sensor
Arduino uno R3
LED'S

IBM CLOUD:It is a cloud platform where we have features of IBM IOT platform.

URL for login/signup: cloud.ibm.com

NODE-RED : It uses HTTP/MQTT protocol to connect devices to IBM IOT platform

FAST2SMS : We use FAST 2SMS for sending message to mobile when the sensor value crosses the threshold.

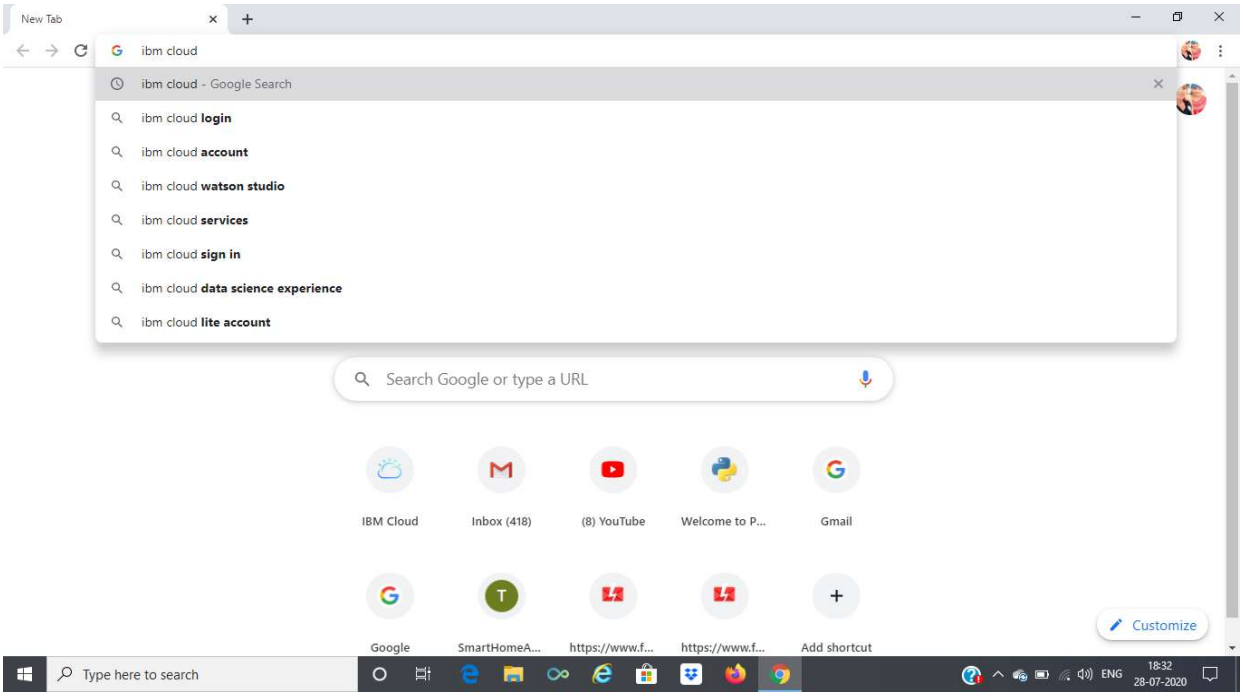
MIT APP INVENTOR : We use mit app inventor for displaying the sensor values in the mobile ap

SETUP ENVIRONMENT

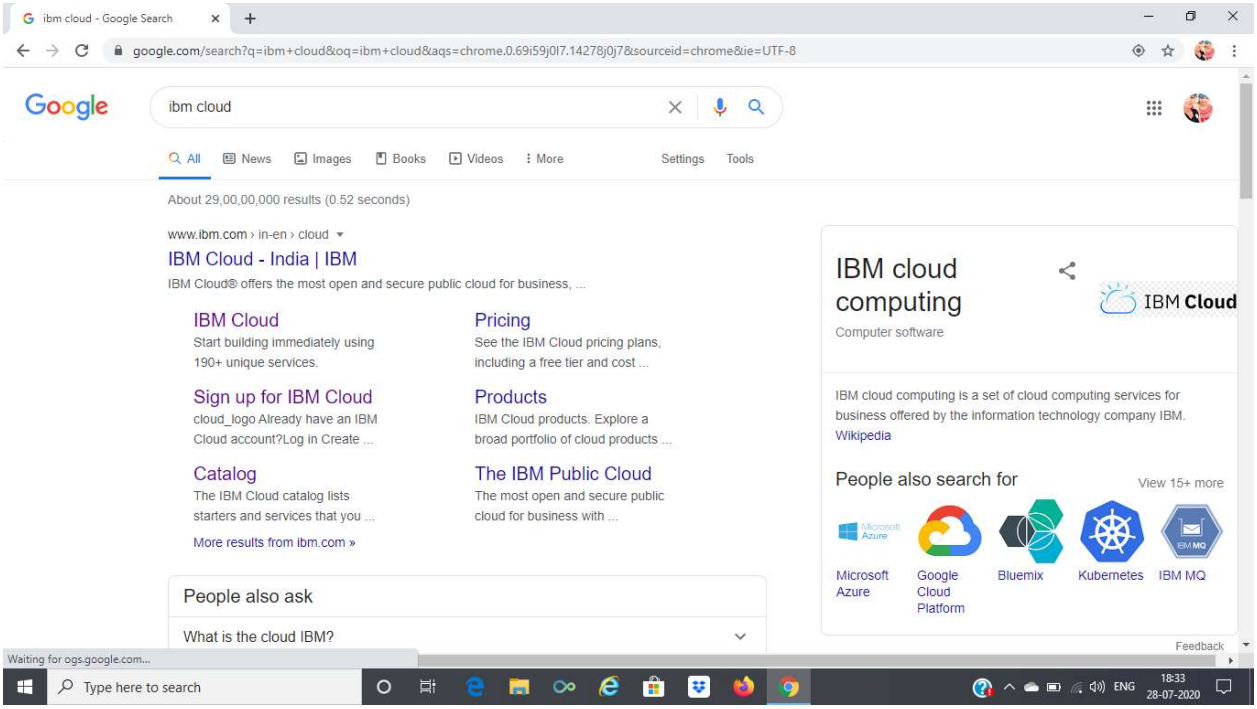
CREATING AN IBM ACCOUNT:

it is provides a full stack,public cloud platform with a varity of products in the catalog ,including compute, storage , and networkingoptions.

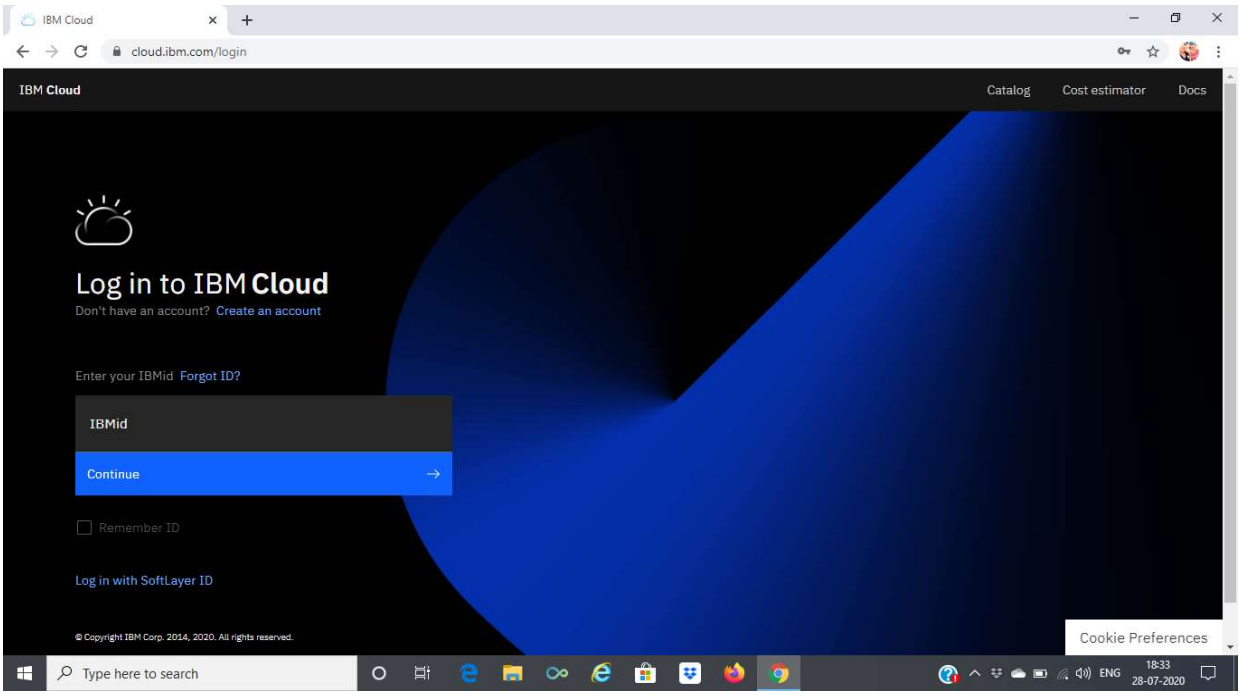
->Go to chrome click on search bar type ibm cloud and search ibm cloud



->click on the first link and enter the ibm cloud



->when u click on the first link you will be redirected to the login page of the ibm cloud



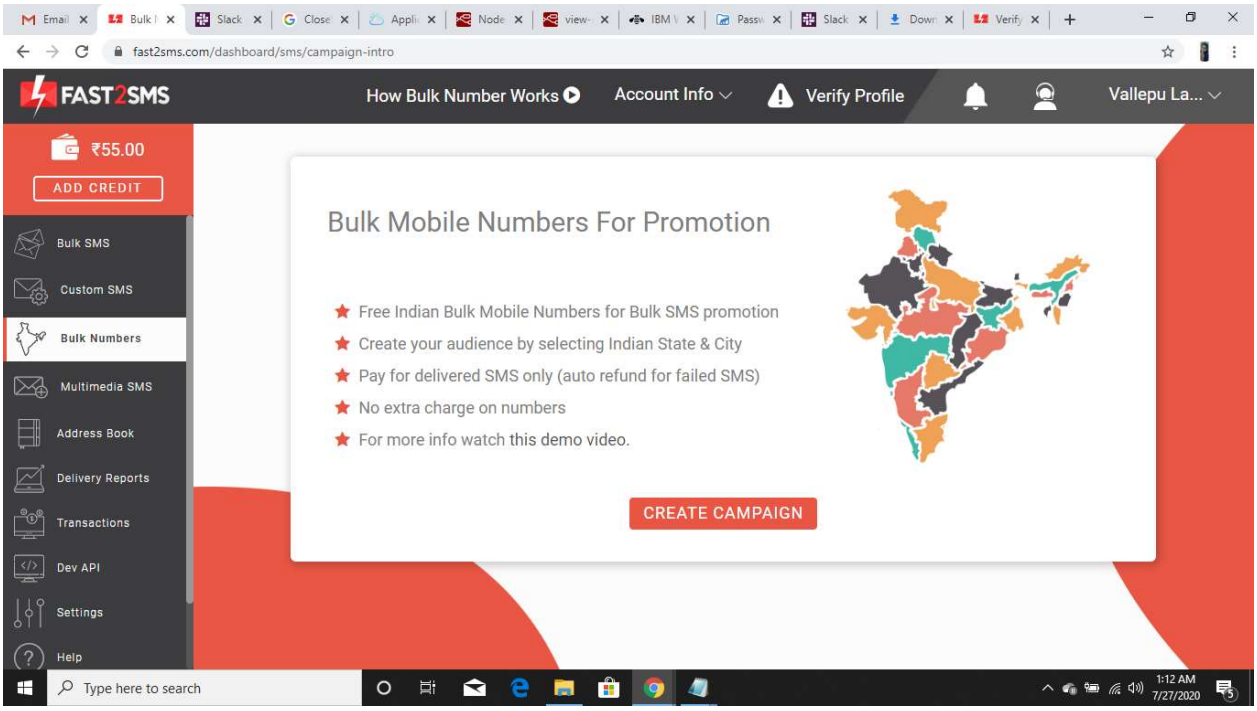
->there you need to create the login with your email id , phone and password details where the needed to submit
->now login to your ibm cloud account
->now you will be redirect to the dash board

Created FAST2SMS account:

it is used to send the non professional sms .it is mostly used for companies
->create a fast2sms account by submitting the required details

->and enter the required email and password details were to verify the account one should submmit the pan card and aadhar card details and upload the required files

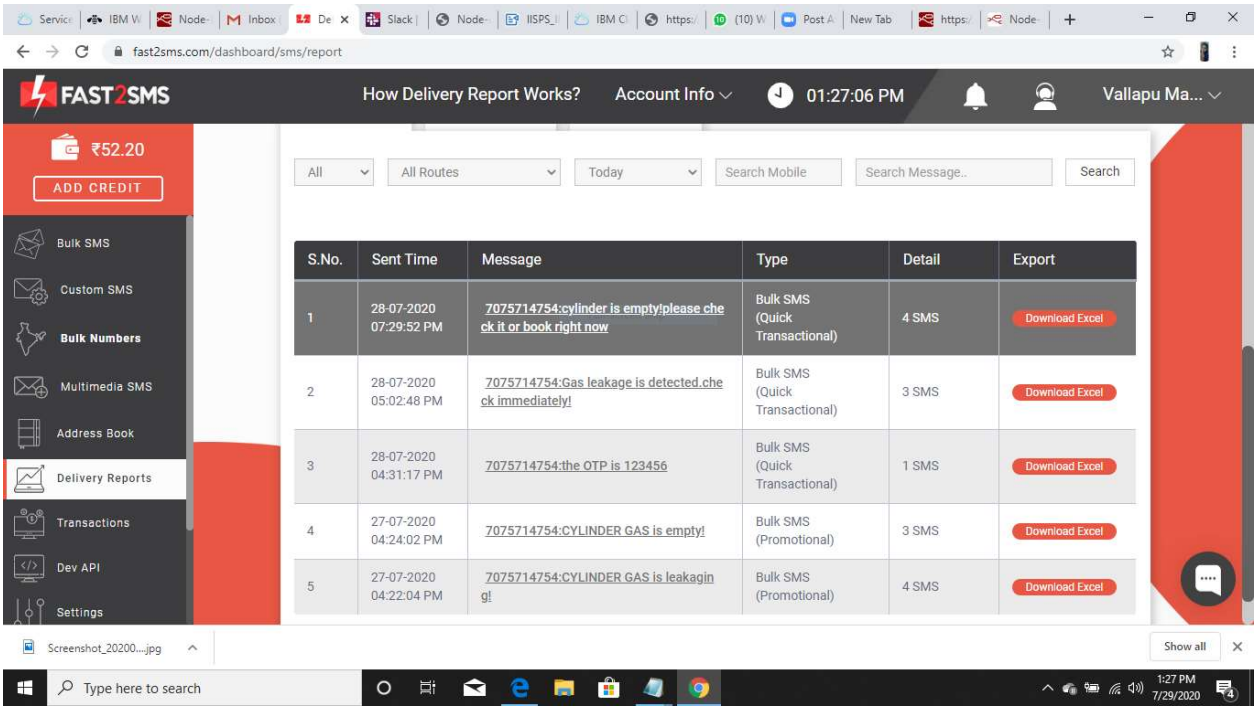
>create an account and send the request the message to the FAST2SMS and the FAST2SMS team will approve your message in 4to 12hour

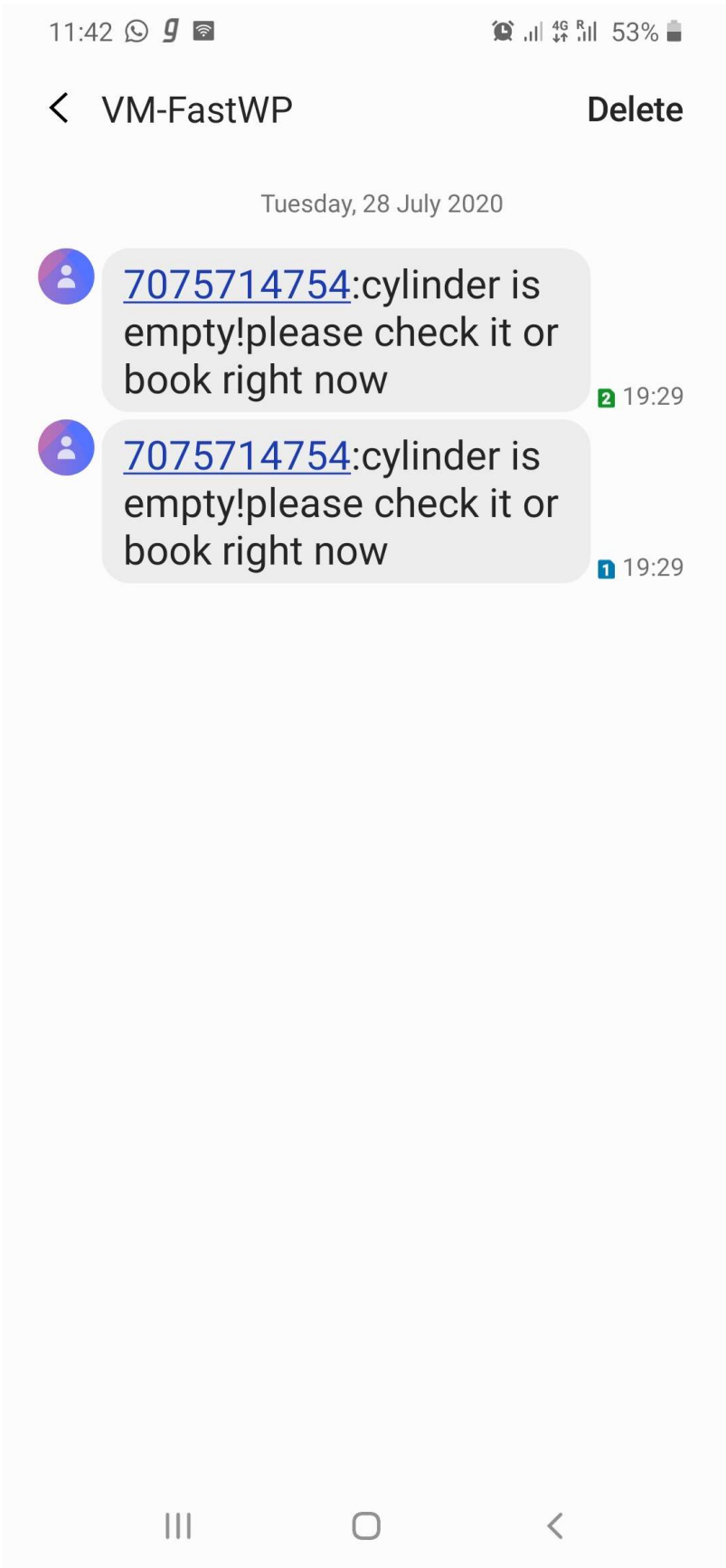


->After the submission click on bulk sms and then click on quick transcational and add the new message or type any message in the text box and contact numbers and select Sender ID as FSTSMS

->now click on send then app will send the messages to the contact numbers which are mentioned in the Quick transcational

->Deliver report shows the total information about what messages are sent

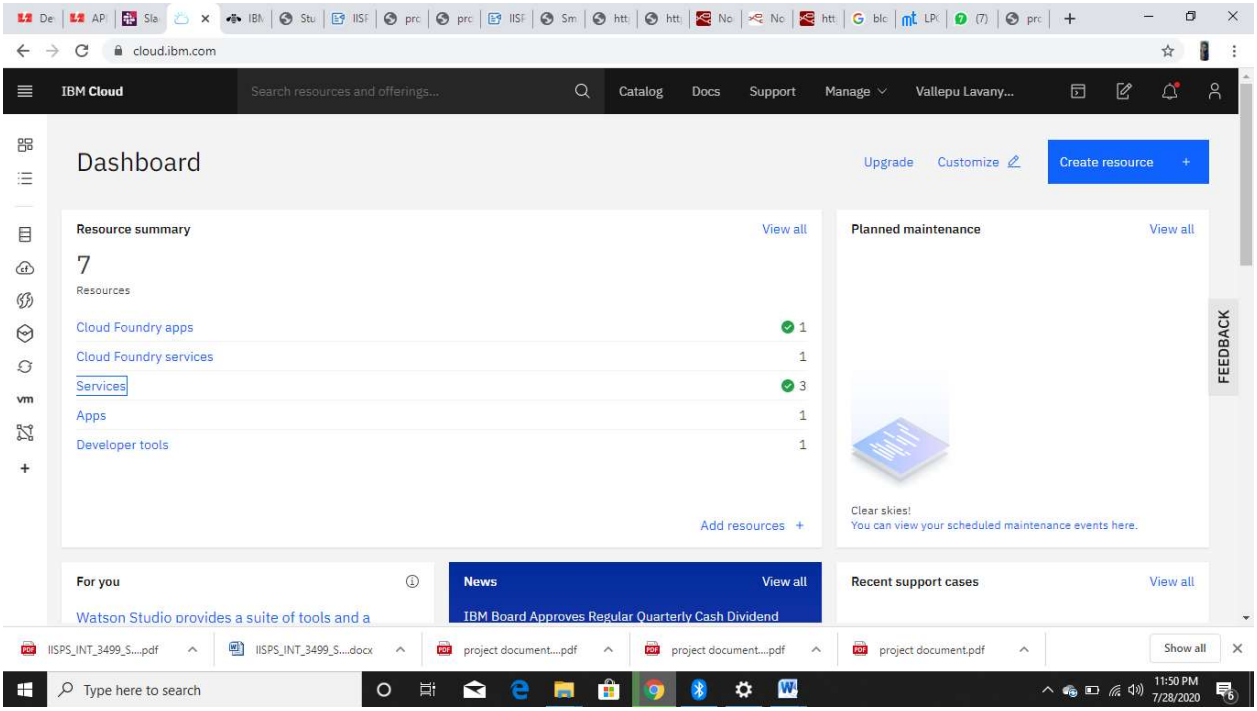

fast2sms.com/dashboard/sms/report
FAST2SMS
How Delivery Report Works?
Account Info
01:27:06 PM
Vallapu Ma...
₹52.20
ADD CREDIT
Bulk SMS
Custom SMS
Bulk Numbers
Multimedia SMS
Address Book
Delivery Reports
Transactions
Dev API
Settings
All
All Routes
Today
Search Mobile
Search Message..
Search
S.No. | Sent Time | Message | Type | Detail | Export
1 | 28-07-2020 07:29:52 PM | 7075714754:cylinder is empty!please check it or book right now | Bulk SMS (Quick Transactional) | 4 SMS | Download Excel
2 | 28-07-2020 05:02:48 PM | 7075714754:Gas leakage is detected.check immediately! | Bulk SMS (Quick Transactional) | 3 SMS | Download Excel
3 | 28-07-2020 04:31:17 PM | 7075714754:the OTP is 123456 | Bulk SMS (Quick Transactional) | 1 SMS | Download Excel
4 | 27-07-2020 04:24:02 PM | 7075714754:CYLINDER GAS is empty! | Bulk SMS (Promotional) | 3 SMS | Download Excel
5 | 27-07-2020 04:22:04 PM | 7075714754:CYLINDER GAS is leakaging! | Bulk SMS (Promotional) | 4 SMS | Download Excel
Screenshot_20200....jpg
Show all
Type here to search
1:27 PM
7/29/2020


11:42
53%
VM-FastWP
Delete
Tuesday, 28 July 2020
7075714754:cylinder is empty!please check it or book right now
19:29
7075714754:cylinder is empty!please check it or book right now
19:29

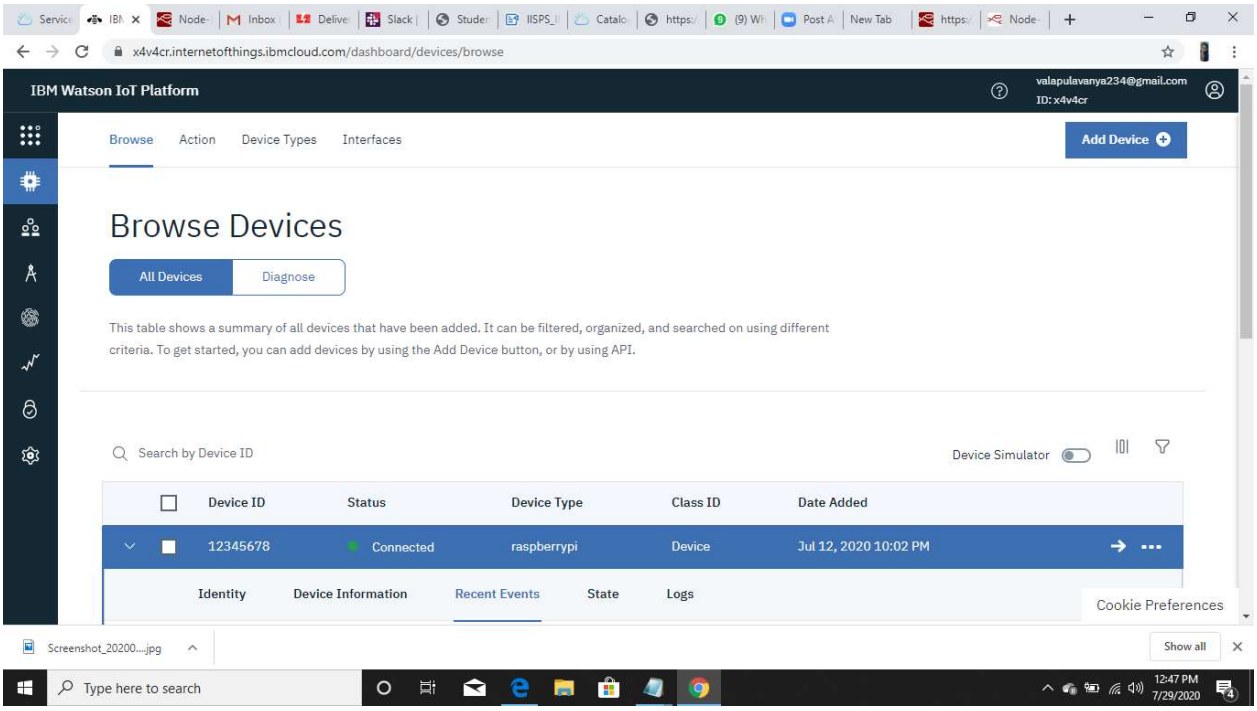
These are the messages sent by fast2sms to mobile application through quick transcational
this link is used to show the sent messages of fast2sms quick transactional messages with template id's by using our API Key:
https://www.fast2sms.com/dev/quick-templates?authorization=BtI4pw8vaiJ1hXYq3UHsIZDbFf5orOTymGSV2NMWLK7xCEcednx7LvdB3jHOhsRmCnJyXMQpaD02btG5

Creating A IBM Watson IOT Platform account and

->The below Dashboard picture shows the Resources summary means what services are developed and details of the services of the IBM Wats

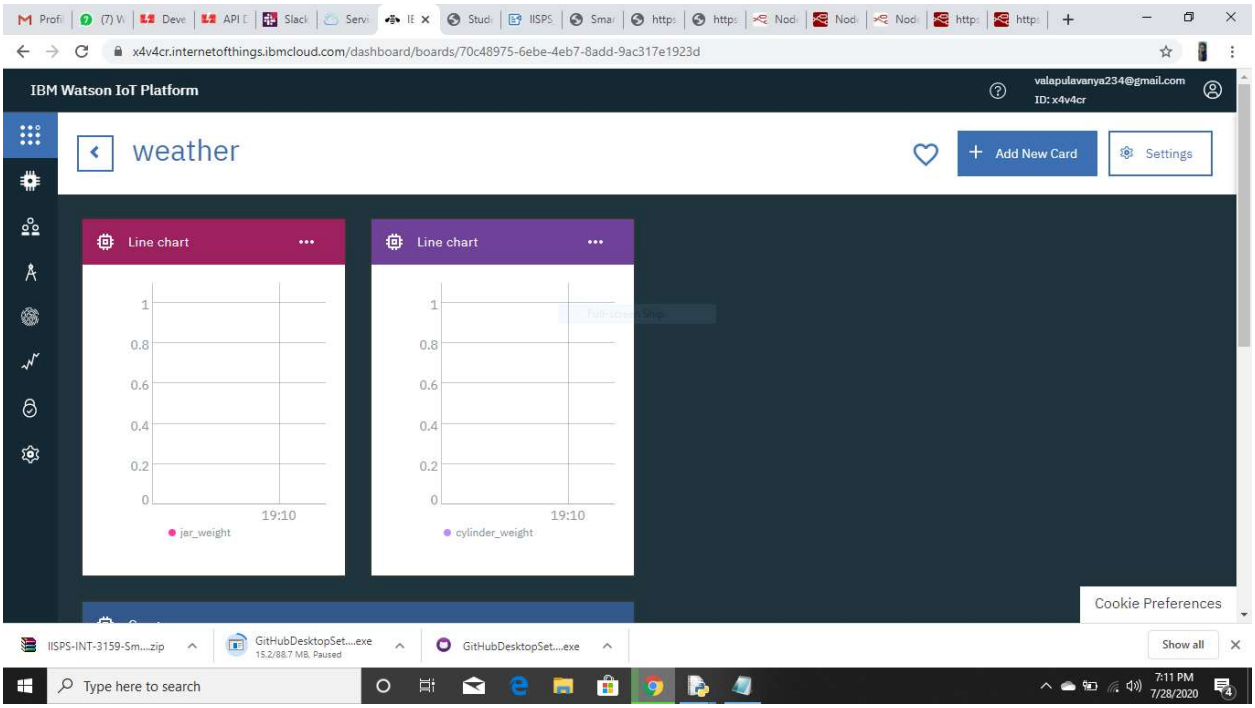


-> Click on the catalog on the dashboard.
-> Search for iot in the search bar provided.
-> Click on the Internet of Things Platform to launch the IoT platform.
->Then your IBM WATSON IOT Platform account is created



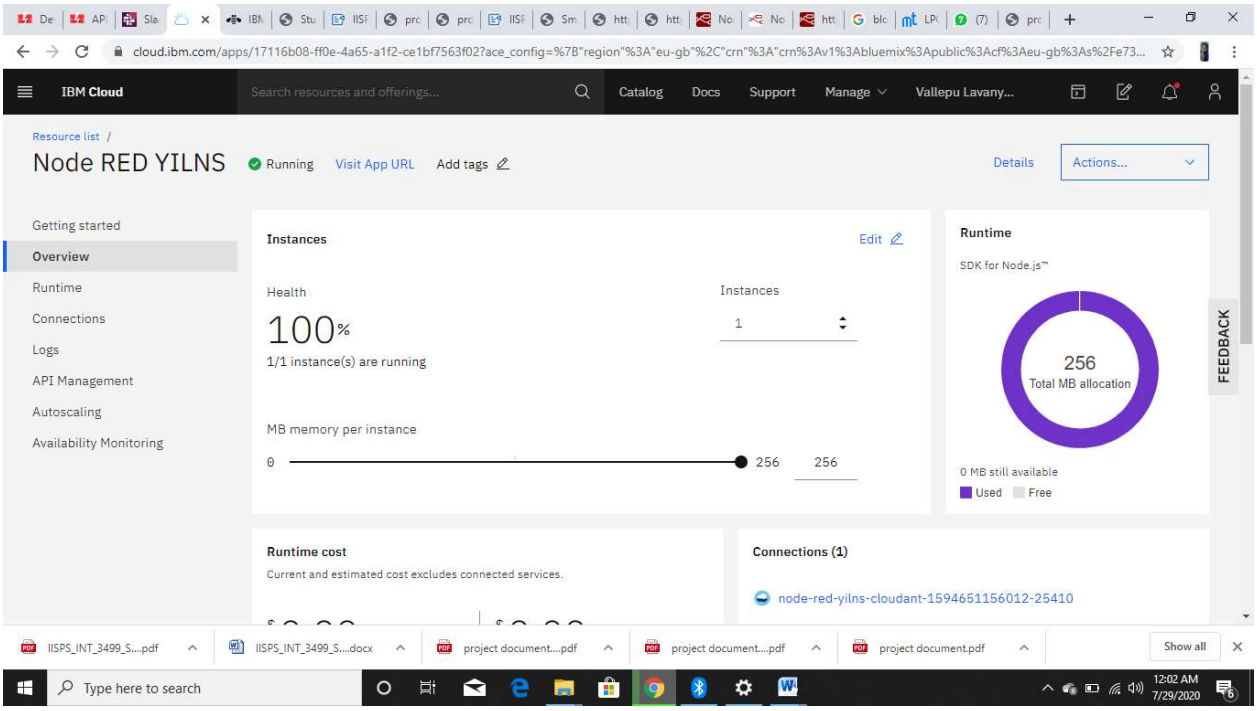
CREATING BOARDS ON IBM CLOUD ACCOUNT

->Go to boards on dashboard of ibm watson iot platform
->click on add new card /create card
-> these boards are used to show the values of python code output which is connected to our device like cylinder weight, status,jar status, jar weight, LIGHT ON/OFF status in the form of gauge ,line chart, status ,etc.....

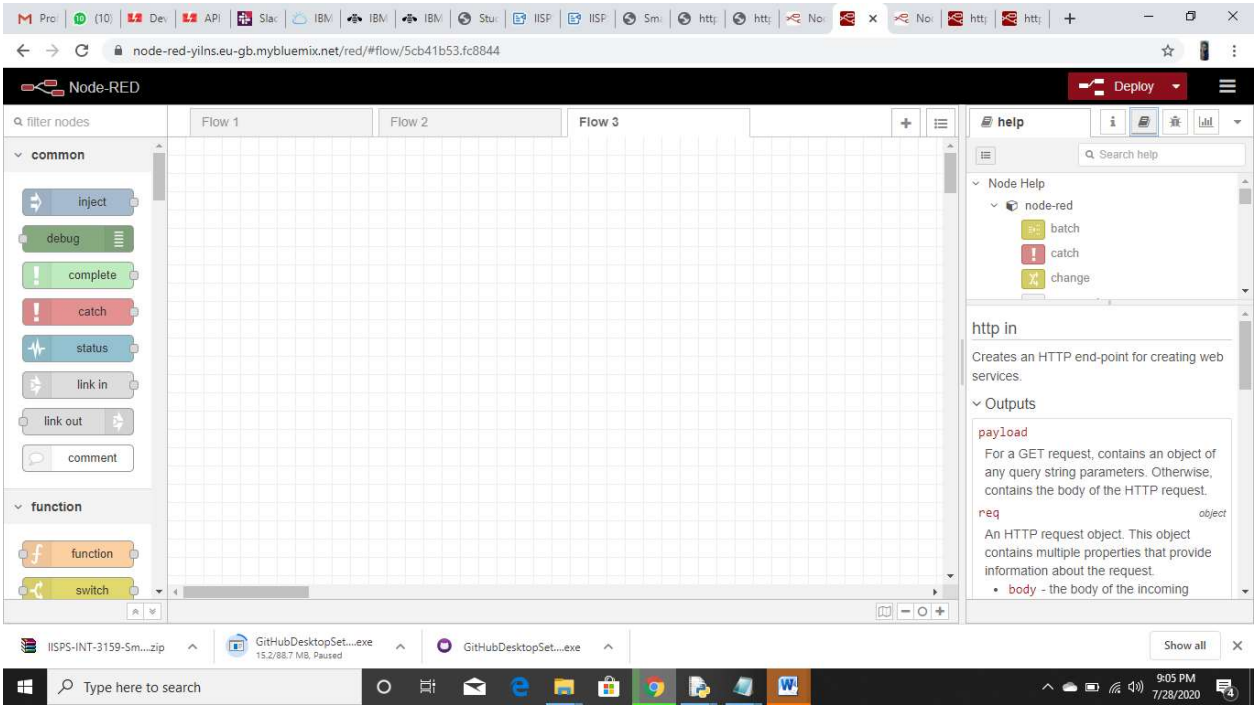


Created NODE-RED Application

->Now create a node red application to attach the python code to the node-red
->click on catalog in the ibm cloud account
-> Click on the software to find the application
->Search for node-red in the search bar provided.
-> Click on the node-red application to create.
->enter the details then u will get one page like



->Now click on Visit App url then node red application is created



Setup Hardware and develop the code

create of python code:

->create a python code to create a smart gas cylinder:

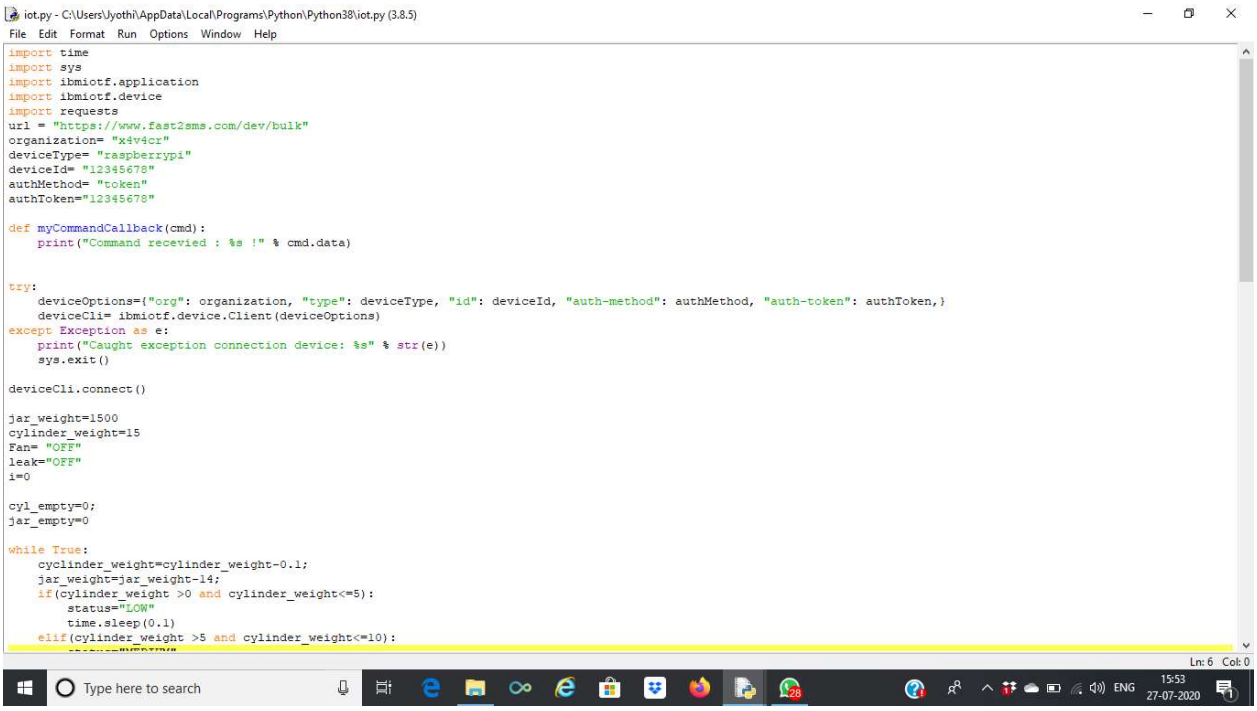
most the developers use python programming language for developing the IOT devices .the small IOT devices have low computational power and memory,so developers choose python scripting language.Nowadays most popular microcontrollers also use python language like micro python board and software package and other. python language is similar to pearl object-oriented programming language. with the precise syntax and readability ,pythonlanguage became more popular,it is an open source language and supports multiple operating systems including UNIX,MAC,DAS, and various versions of Microsoft Windos.

python plays a significant role in developing internet of the thigs,along with python we use different languages for deveoping IOT those are

.Assembly
.B#
.C
C++
.JAVA
.JAVASCRIPT
.PHP
.PYTHON
.RUST AND MAN MORE

->now add the required details ti create a smart kitchen

.Cylinder Weight
Cylinder Status
.Gas Leakage
.Jar status



now attach the device detals to the python code and run the code

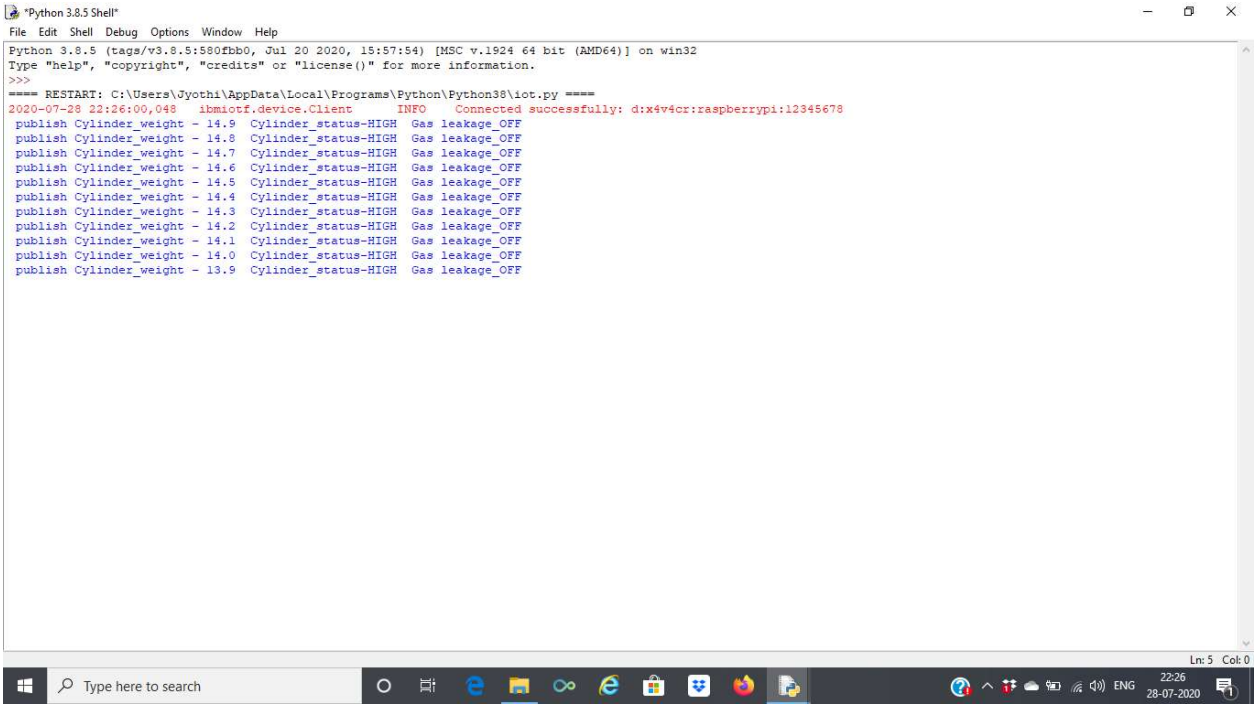
.now when u run the u code u will see the all the circumstances

.now go to the ibm cloud

.go to devices

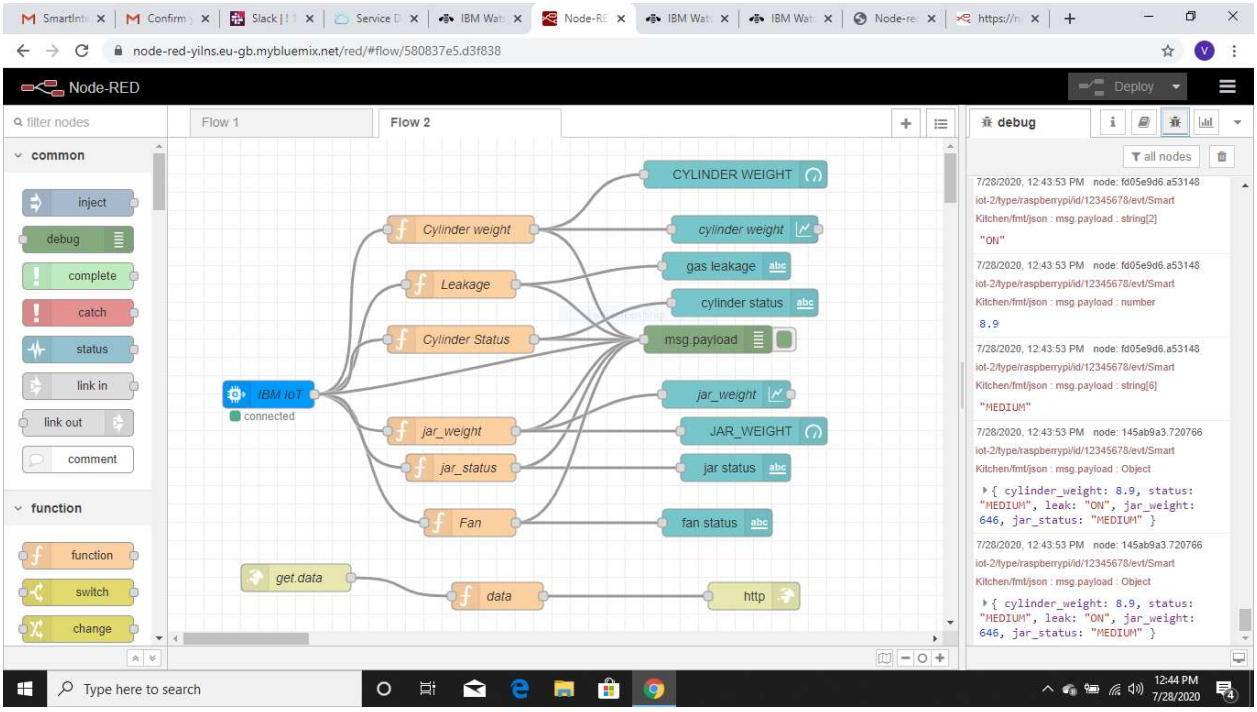
.and click on device type

.will see the code run under



CONFIGURE A WEB APP

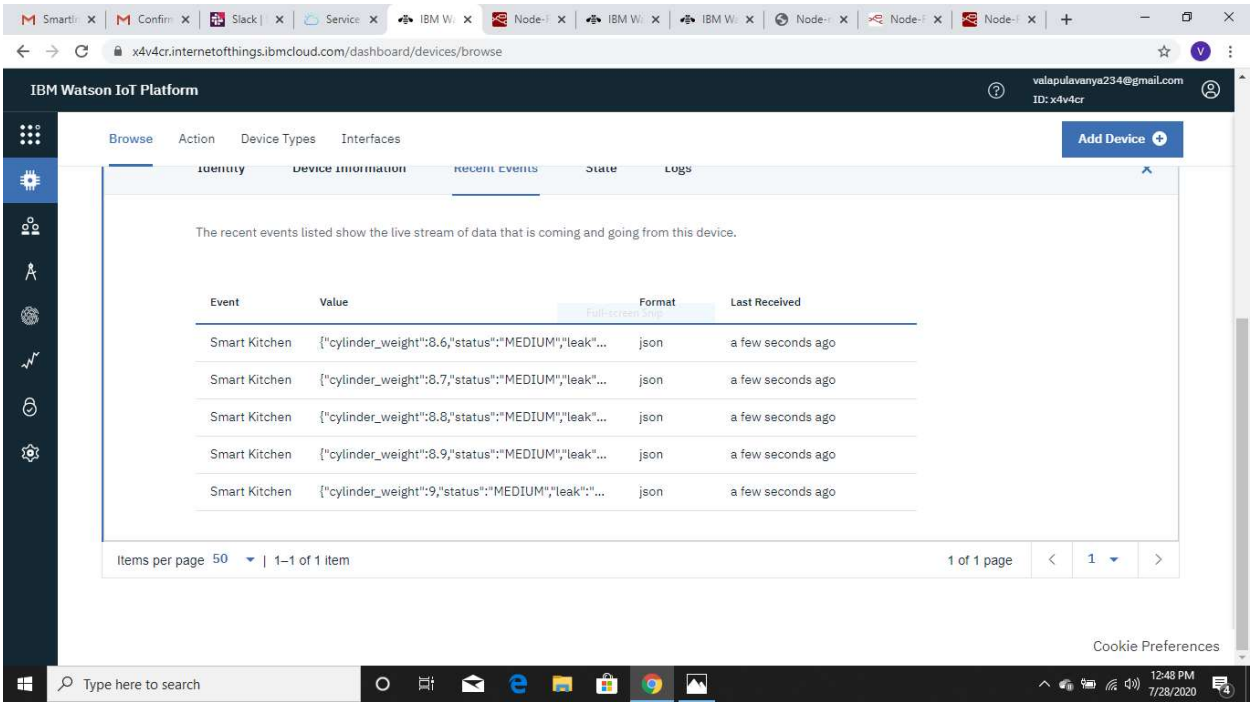
CONFIGURE A WEB APP
Created A NODE-RED flow to get data from the Device

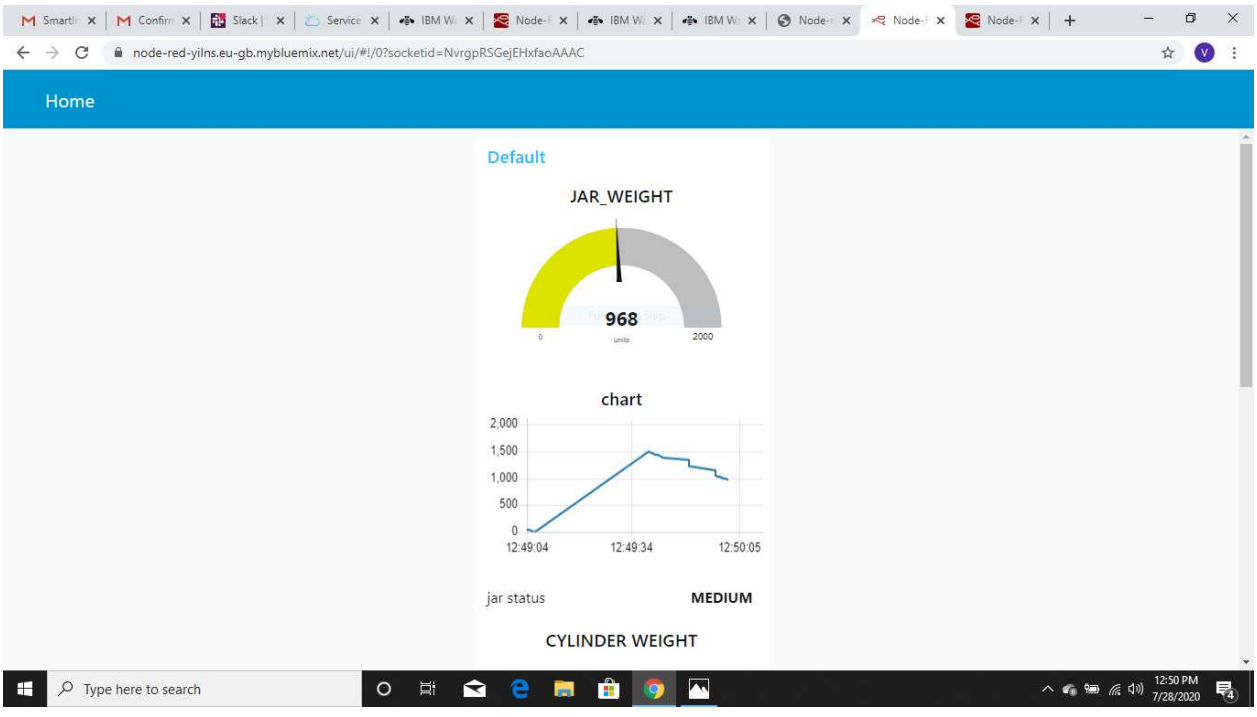


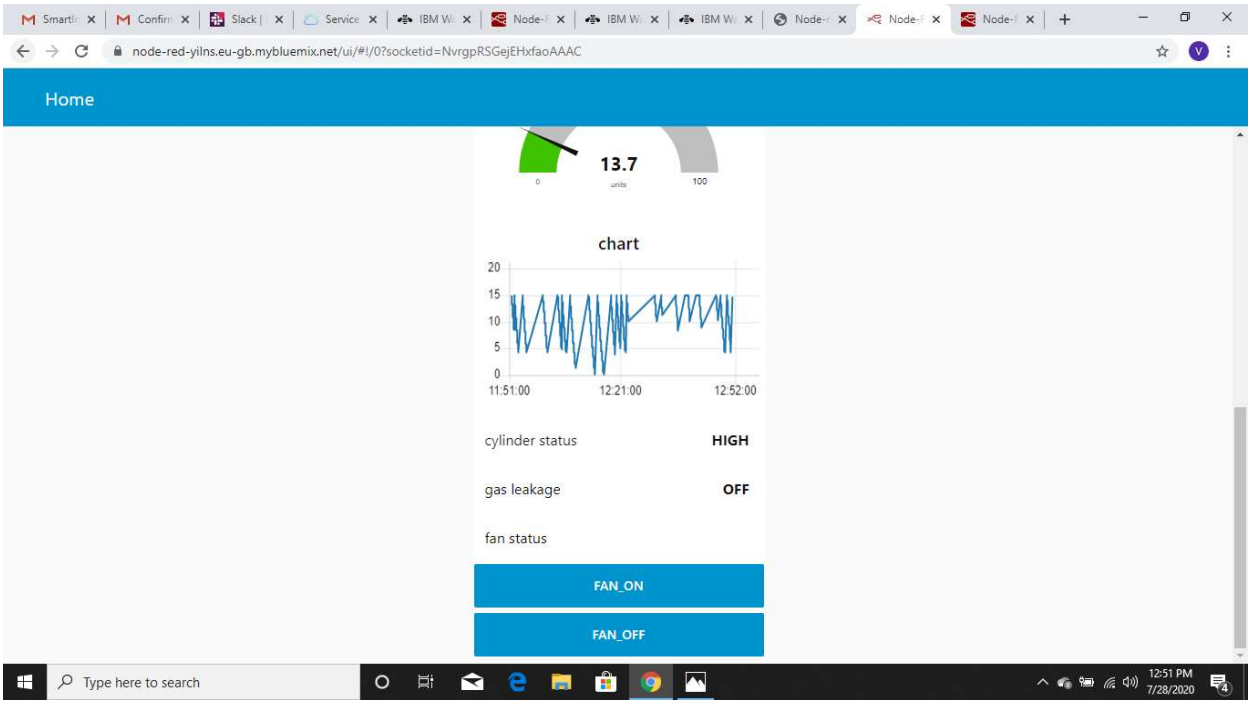
OUTPUT OF THE NODERED AFTER EXCUTING THE PYTHON CODE

After creating nodered application

Copy the NodeRed URL till .net and paste in the new tab by typing /ui then u will get output like this


x4v4cr.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
valapulavanya234@gmail.com
ID: x4v4cr
Browse
Action
Device Types
Interfaces
Add Device
Identity
Device Information
Recent Events
State
Logs
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":8.6,"status":"MEDIUM","leak"...
json
a few seconds ago
Smart Kitchen
{"cylinder_weight":8.7,"status":"MEDIUM","leak"...
json
a few seconds ago
Smart Kitchen
{"cylinder_weight":8.8,"status":"MEDIUM","leak"...
json
a few seconds ago
Smart Kitchen
{"cylinder_weight":8.9,"status":"MEDIUM","leak"...
json
a few seconds ago
Smart Kitchen
{"cylinder_weight":9,"status":"MEDIUM","leak":"...
json
a few seconds ago
Items per page 50
1–1 of 1 item
1 of 1 page
1
Cookie Preferences
Type here to search
12:48 PM
7/28/2020


node-red-yilns.eu-gb.mybluemix.net/ui/#!/0?socketid=NvrgpRSGejEHxfaoAAAC
Home
Default
JAR_WEIGHT
968
0
2000
chart
2,000
1,500
1,000
500
0
12:49:04
12:49:34
12:50:05
jar status
MEDIUM
CYLINDER WEIGHT
Type here to search
12:50 PM
7/28/2020



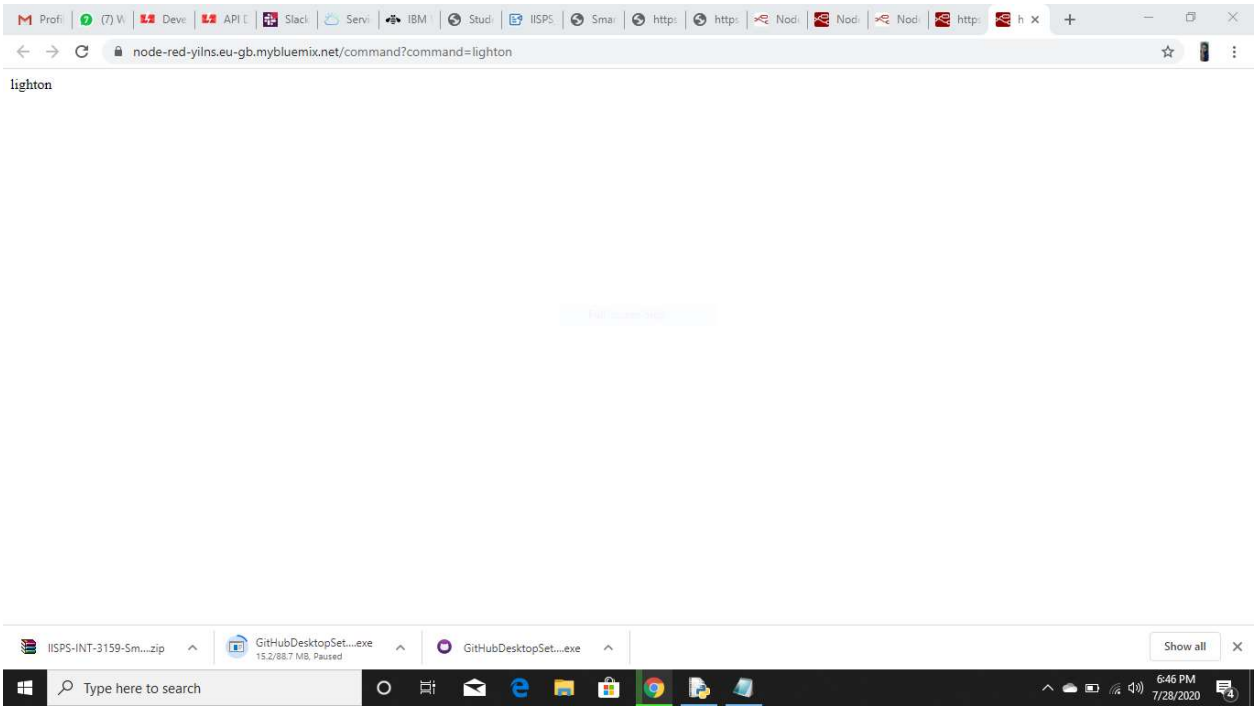
Creating an HTTP request for getting the values of gas cylinder weight,status ,jar weight,jar status and leakage status .

Display the values of gas cylinder in the webpage by dragging and placing the HTTP Input and HTTP Response node in the NodeRed flow editor.

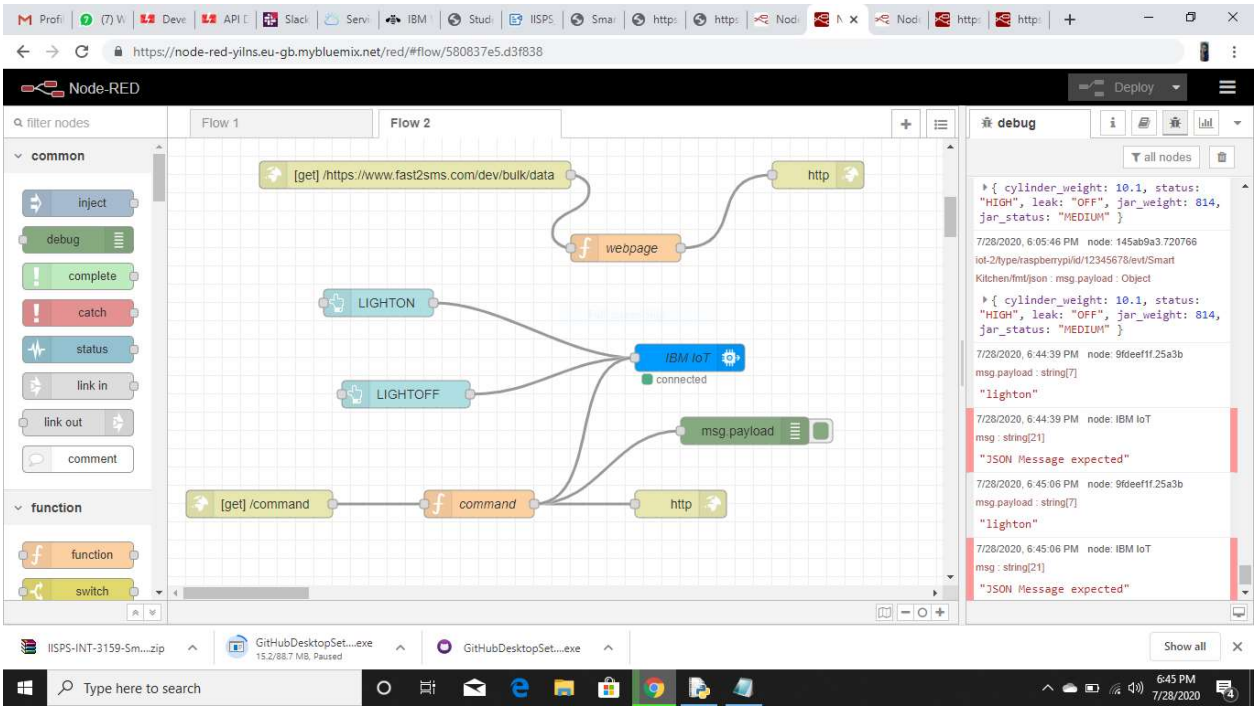
Copy the URL in the NodeRed flow till .net and paste in the new tab by appending “/data” along with the URL and press Enter. cylinder values will be displayed on the webpage

Open NodeRed flow editor to create an HTTP request to get command from the mobile app to device

OUTPUT: copy the URL of the NodeRed flow till .net and paste in the new tab and write [/command?command=lighton] for light on and [/command?command=lightoff] for light off to check whether URL is working properly or no



- then u will get LIGHTON message in the debug of NODE RED app



Buliding a Web App

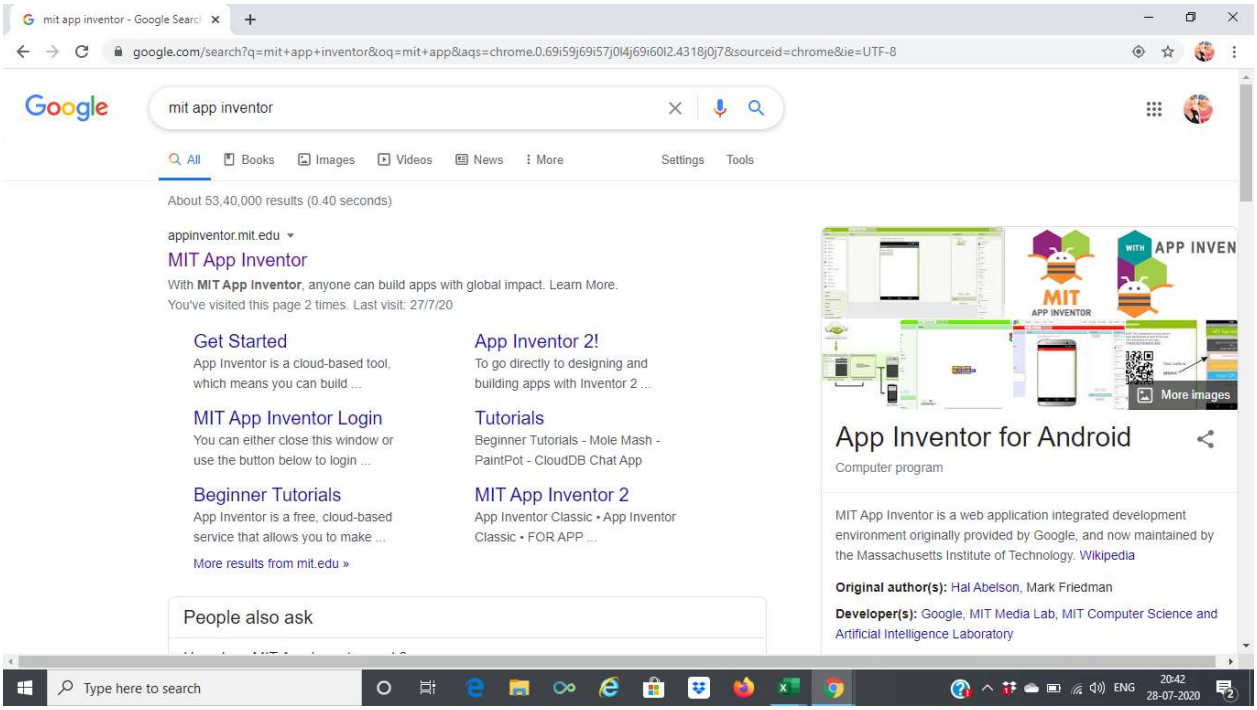
Design your UI to display the quatity of the product in the jar

->for creating a web app a you need to go to chrome

->search for the mit app inventor:

MIT app inventor is an online platform designed to teach computational thinking concepts through development of mobile applications students create application by dragging and droping components into a design view and using a visual blocks a language to perform the apllications behaviour

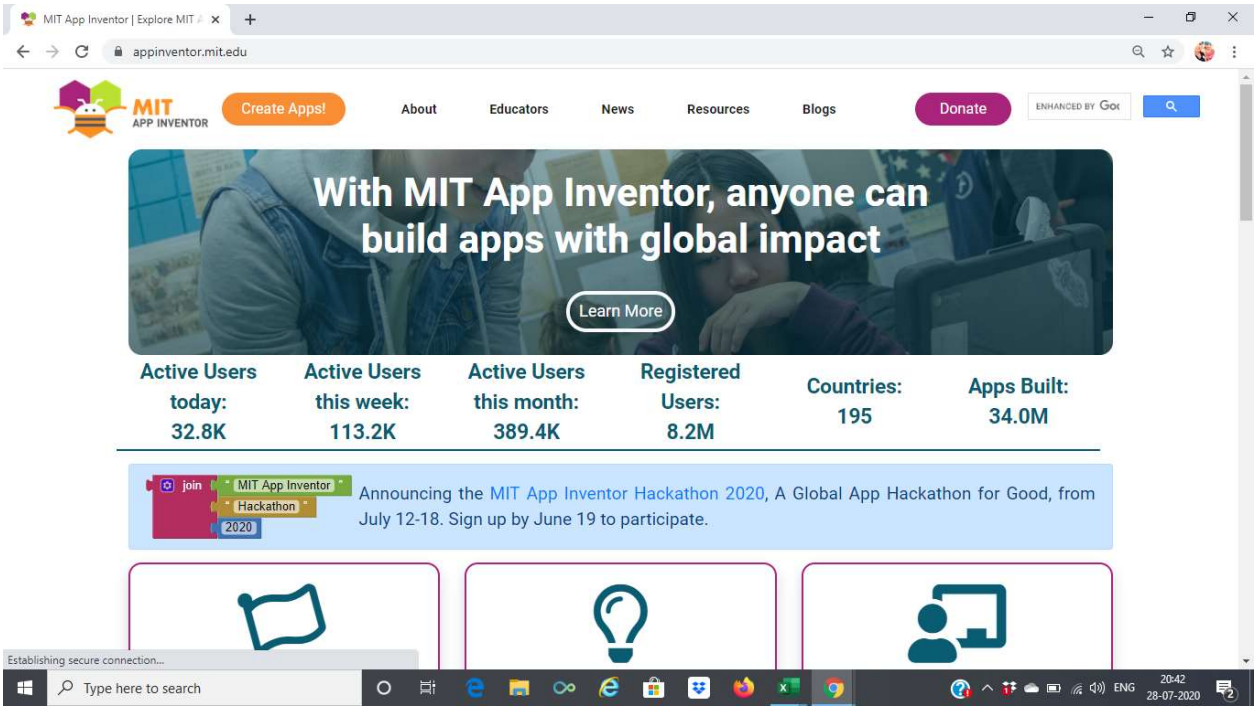
The smartphone is an information nexus in today's digital age, with access to a nearly infinte supply of content on the web,coupled with rich sensors and personal data. however,people have difficulty harnessing the full power of these ubiquitous evices for themselves and their communities



Here mit app is used to make a web application to connect to ibm cloud

.now click on the first link when you search for mit app inventor now

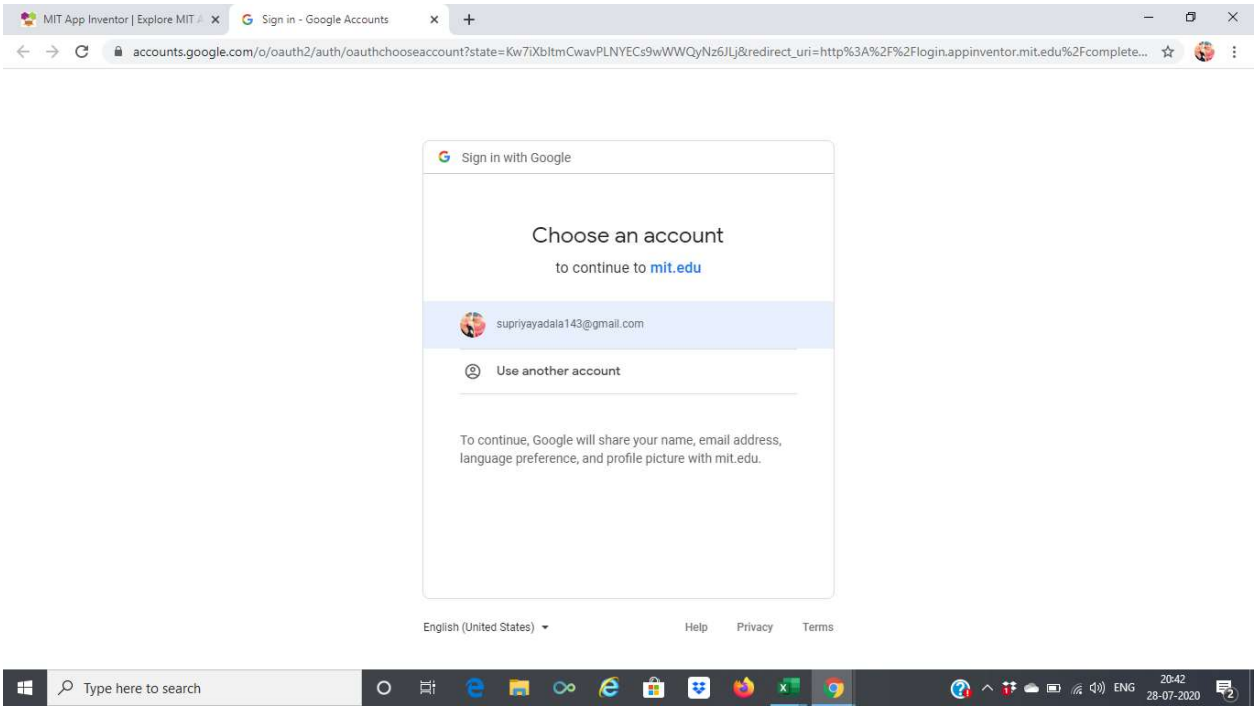
.then you is the interface mentioned in the picture below



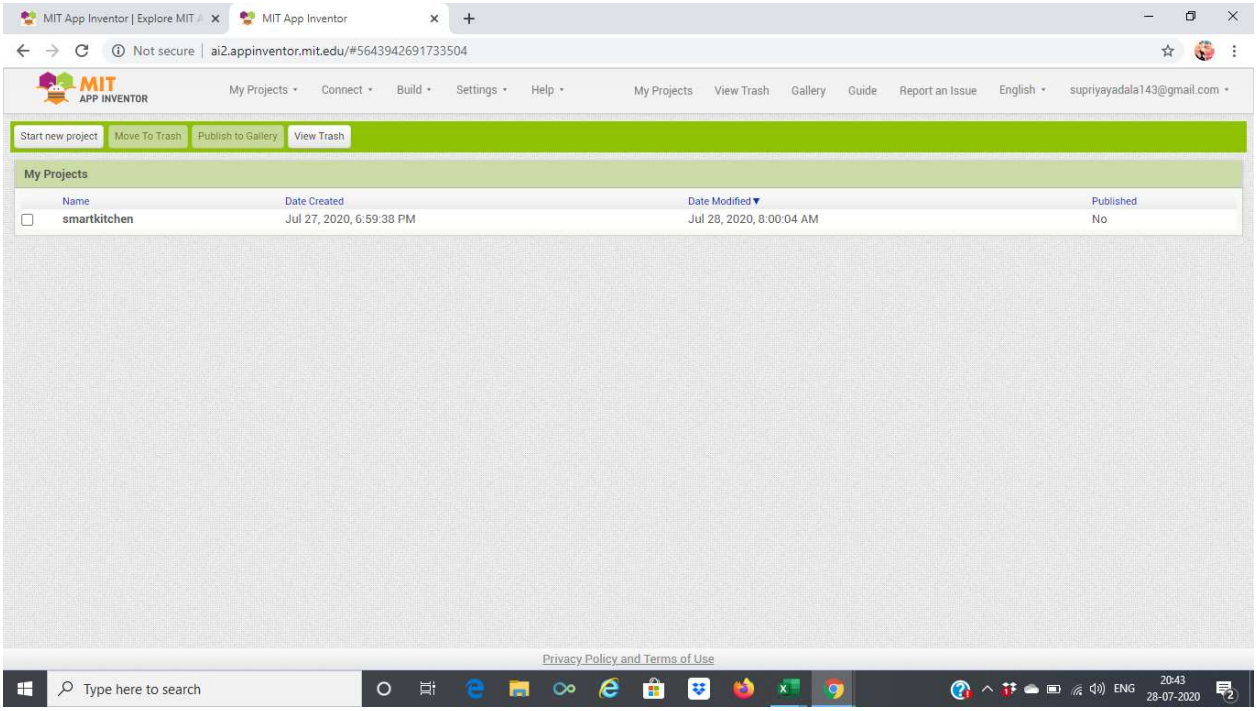
.now click on the create apps (orange button)it will ask u what to create click on the appmaker

.now agree the terms and conditions of the mit app inventor

.give the correct email id and sign to the mit app inventor



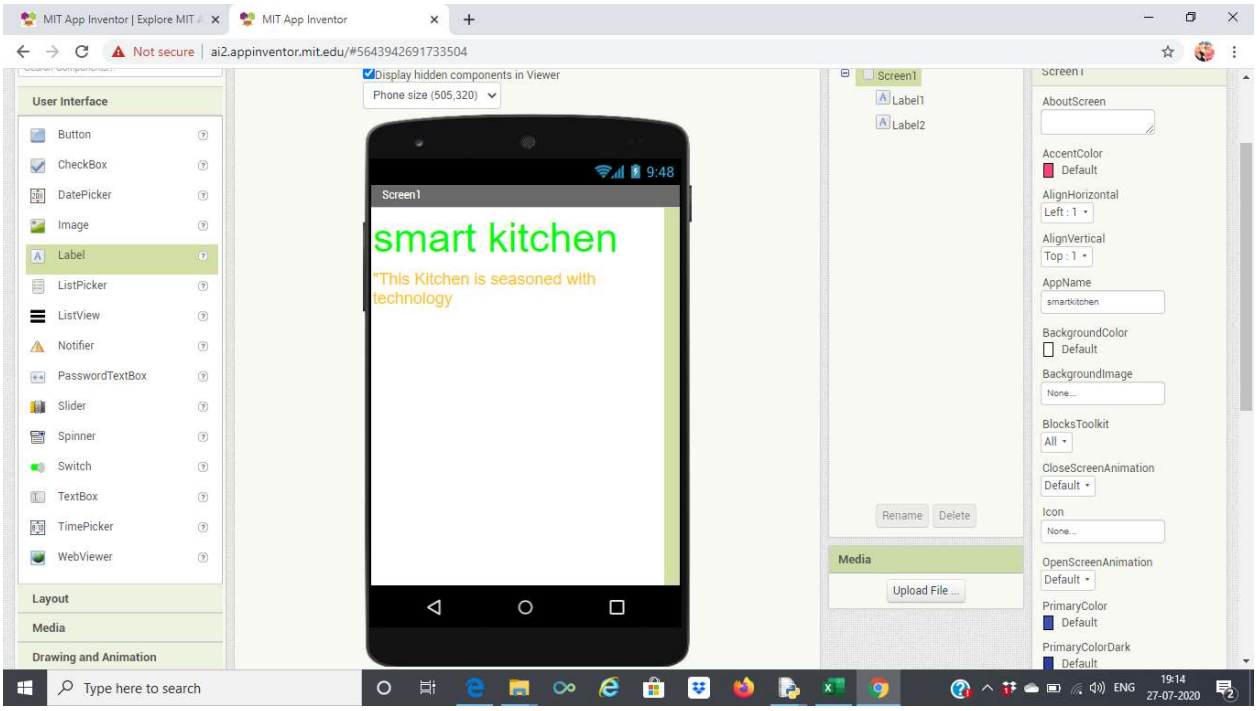
.now click on the create new project



.Before creating app give the name to the app

.now when u create a new .click on the that app

.now when you click on the your project you will see the interface below



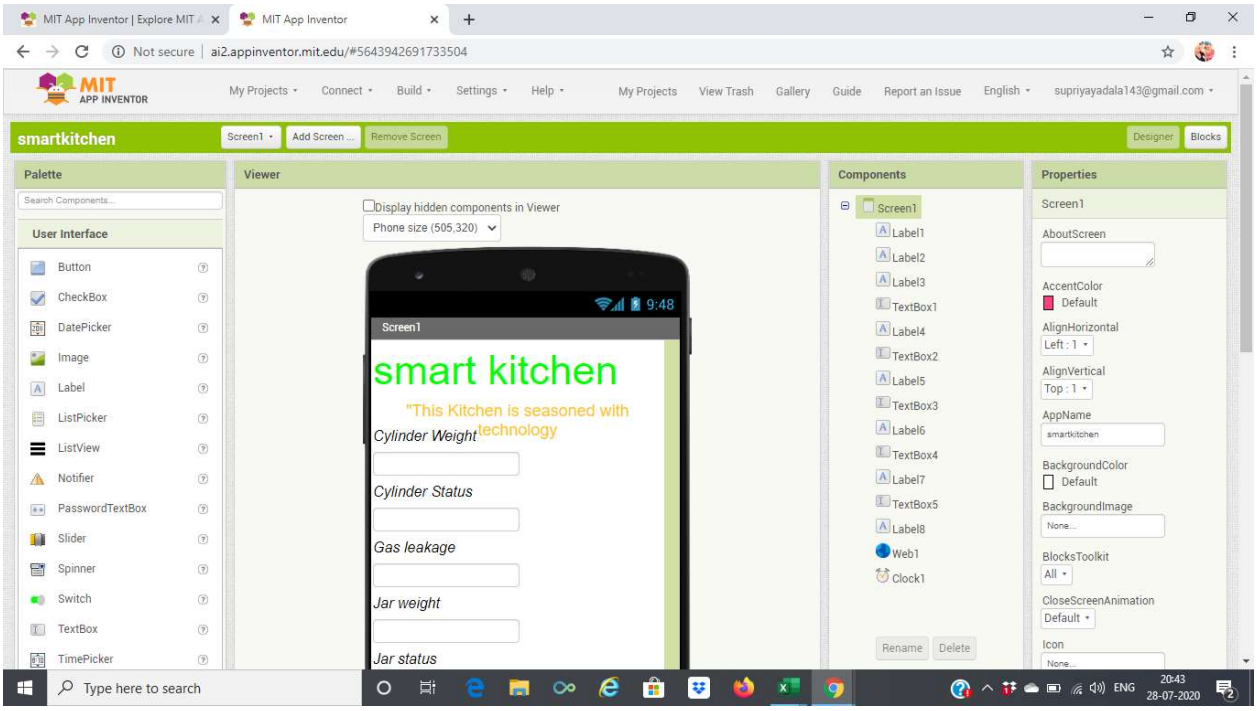
.now you see mobile screento modify

.you can change the mobile interface into tablet(tab) and laptop/computer screen

.at the left side you can is the lables and the right side we can adjust the lable and textbook details

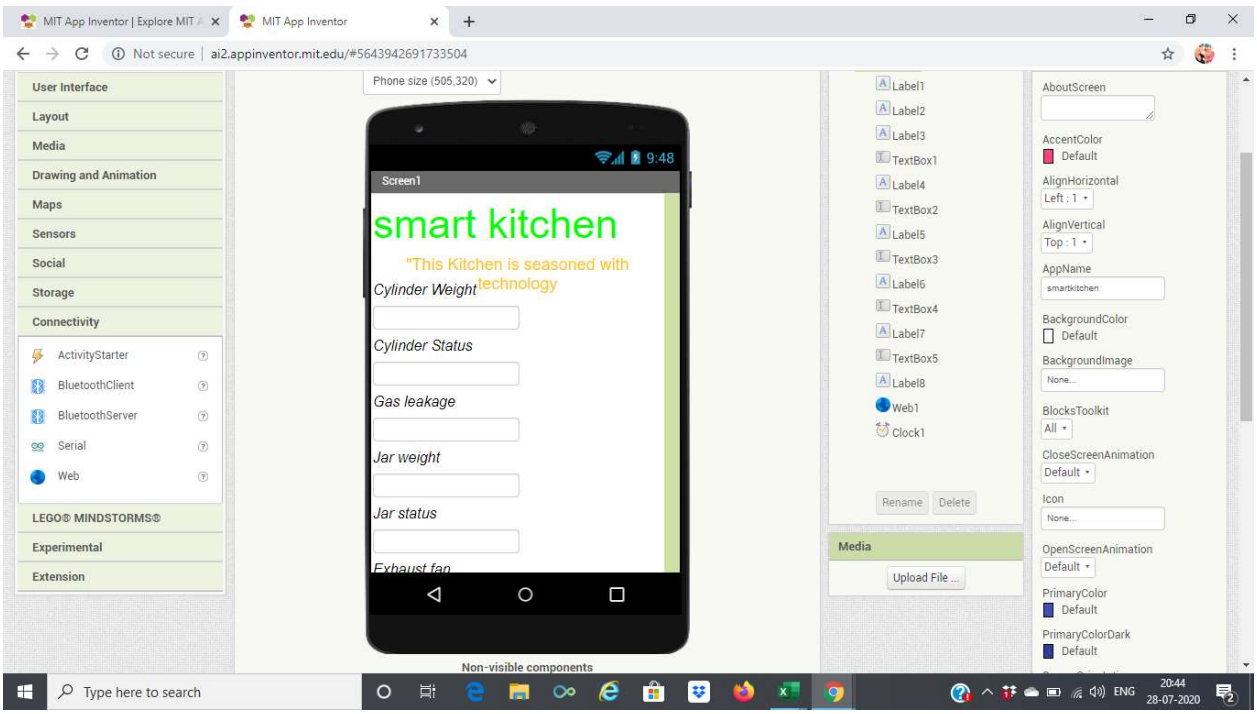
.now you can create the app user interface

.which you wanted to belike:



now when u create a interfacein the phone

.we need to connect the phone to the internet



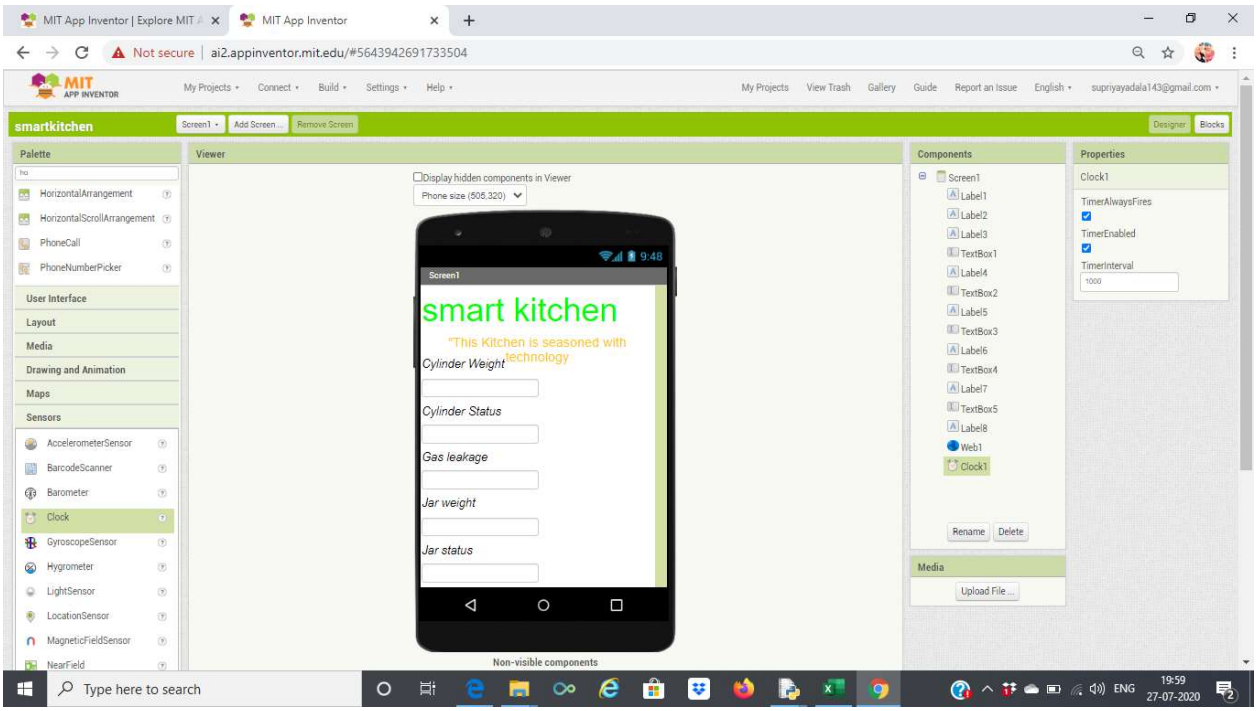
now click on connecting

.now you can see the web icon

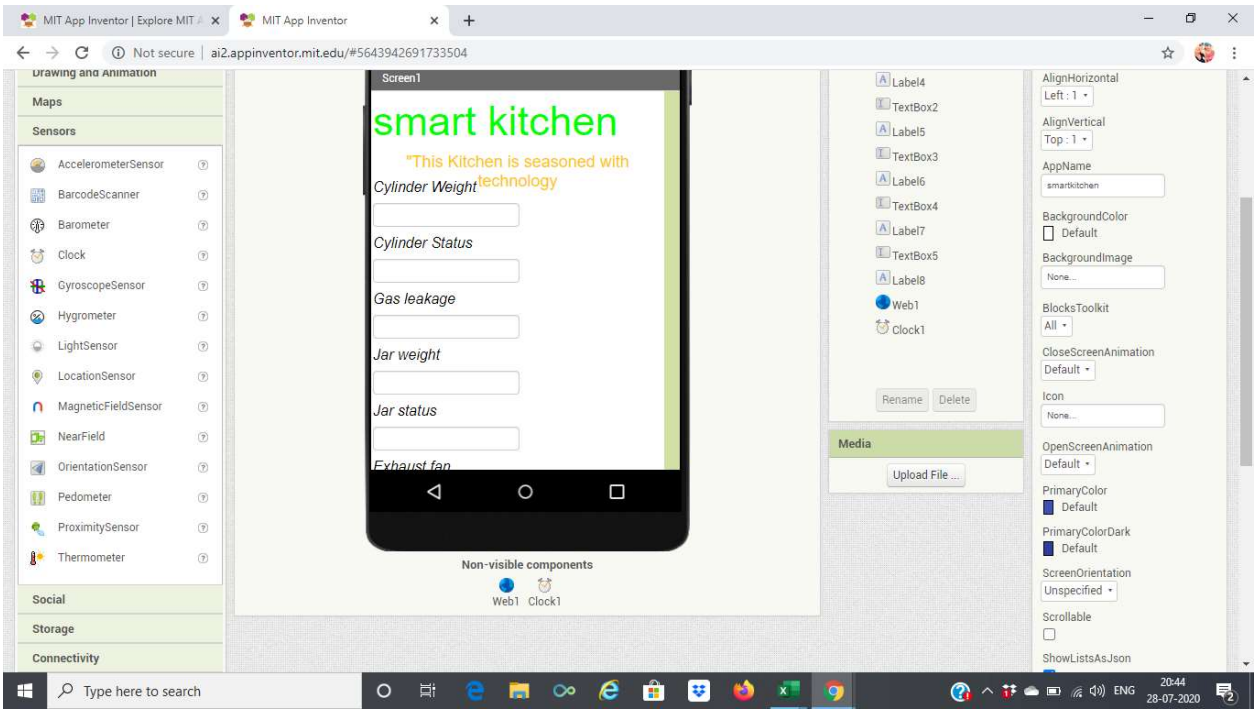
.drag and drop the web icon on the phone

.now ur phone is connected to the internet

.now connect the clock symbol to the phone



.now your phone is connected clock and web



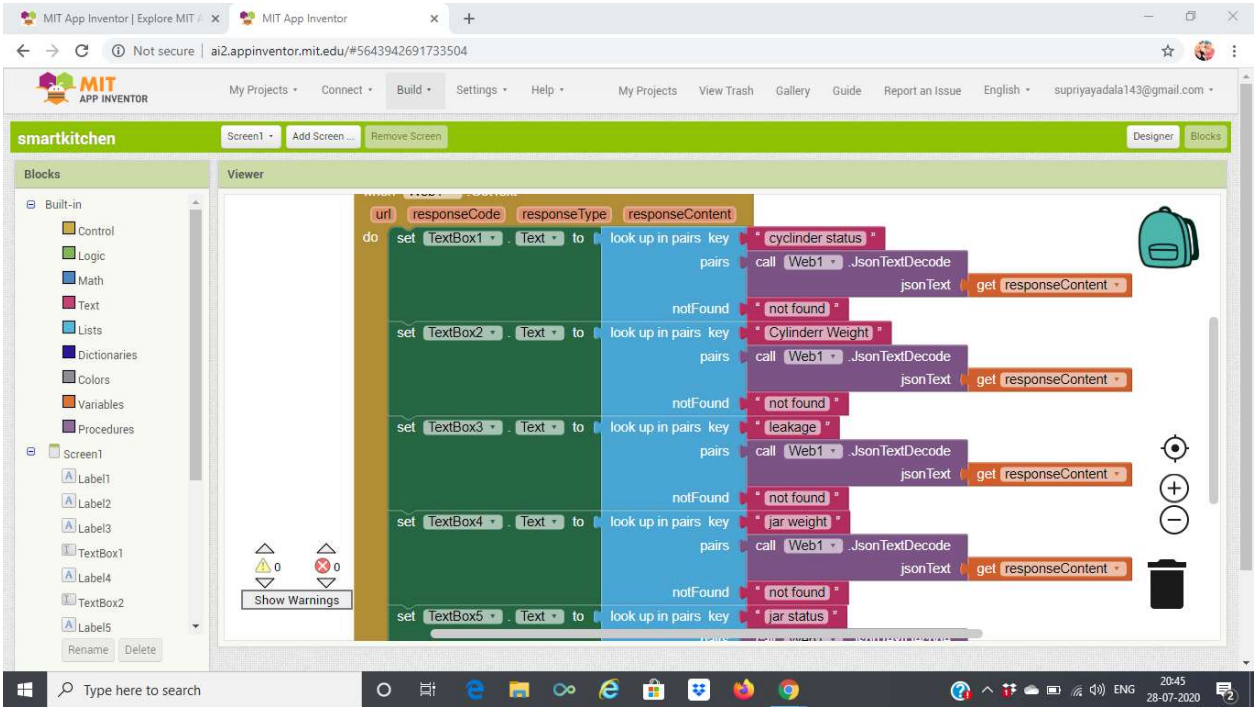
.and this is the front end of the user interfacenow

click on the right top side blocks to see theback end part of the app

.now u need to the arranage the blocks as the format of drag and drop method

.when u come to the blocks side u will see the empty interface

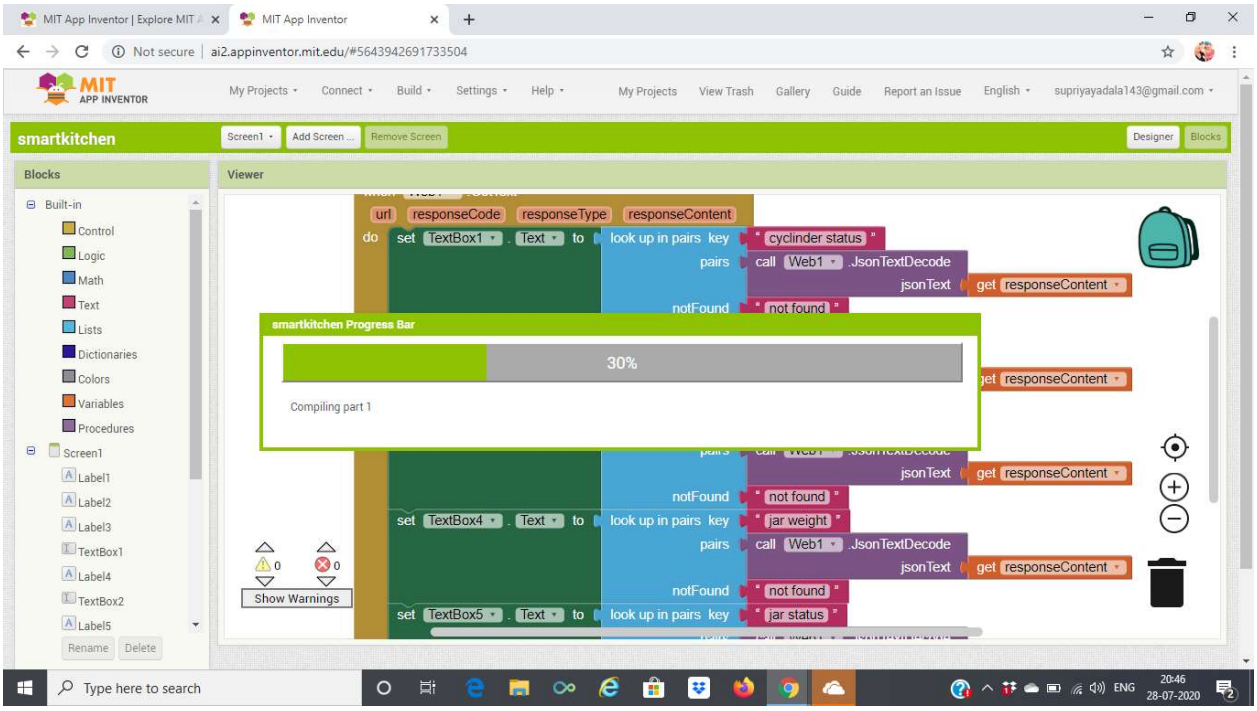
.we need to arrage the block as we created the user interface
.To arranage the blocks.we should drag and drop the required blocks to the dashbord and arrange the blocks as required
.I will show you how I created the blocks code in the mit app inventor



.now as we see the back end part of the app

.you can see the app byclick on the build button of the screen

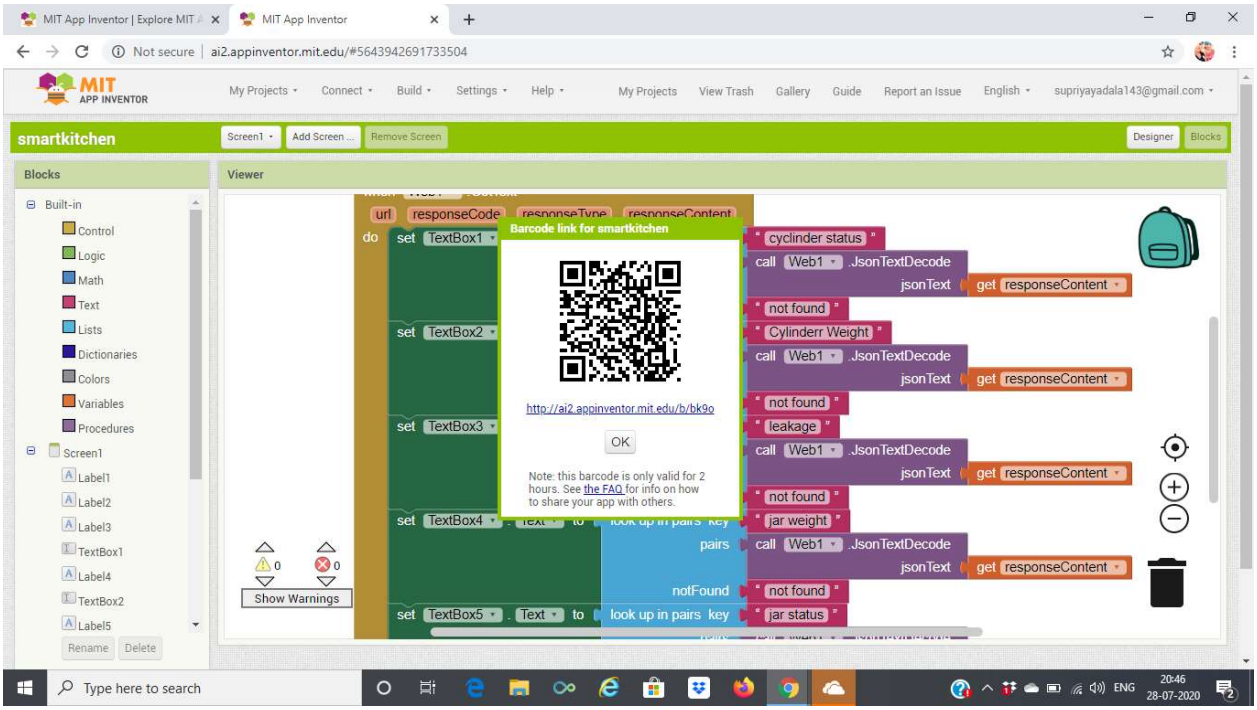
now when u click on the bulid u can see the loading screen as below



.now you see the loading wait for the loading to complete

.This may take acouple of minutes to load to 100% complete

.after the compeltion of the loading u can see the QR code



when you scan the QR code in google scanner you can see the app and you can

download or you can click on the link to the to get the app and its interface.

conclusion:

our smart kitchen using IOT system with multiregional sensors ha been designed ,construted and tested .The result obtain from the tests carried out shows that the system is capable of sending messages or(sms) alerts whenever there is gas concentration at the inputs of the gas sensors.Hence thissystem can be used in home and public bulidings such ad hotels and restaurants.smart kitchen provides you all the automation features that include safety features over ga leakage detection system.for this we are using gas sensors are used to detec the leakage of a gas in the system,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.Temperaturen 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 hardware,sensors,and also stores the information about the hardware,sensors, andalso maintain the logs and status of the system,also stores the room temperature and information about the users.Threshold values are set into room,when it crosses that values it willsend the notification to the user about the leakage of a gas cylinder and leakage of a gas.Server can communicate with the user throught android device,Through email and SMS

server can sends a notification to the user which will display on the android devices.it can pevent the accident and hazards.the only way to access the information is if 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,hospital management,military management,industrial applications, one of the notifications is to provid the system with a dual power supply i.e. include a battery

power supply source in addition to the utility power supply.

design the sensored that can be used for more kitchen parameters. Apply various techniques to make te system more secure.

Thanking you