SCHOOL OF COMPUTING (SOC)

IOT CA2
Step-by-step Tutorial

DIPLOMA IN BUSINESS INFORMATION TECHNOLOGY
DIPLOMA IN INFORMATION TECHNOLOGY
DIPLOMA IN INFOCOMM SECURITY MANAGEMENT

ST0324 Internet of Things (IOT)

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Prepared for: Ms Dora Chua

Class: DIT/2B/35

Submitted by:

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Table of Contents

Section 1
Overview of project

A.　Where we have uploaded our tutorial

Paste the link here of your Youtube and tutorial document here
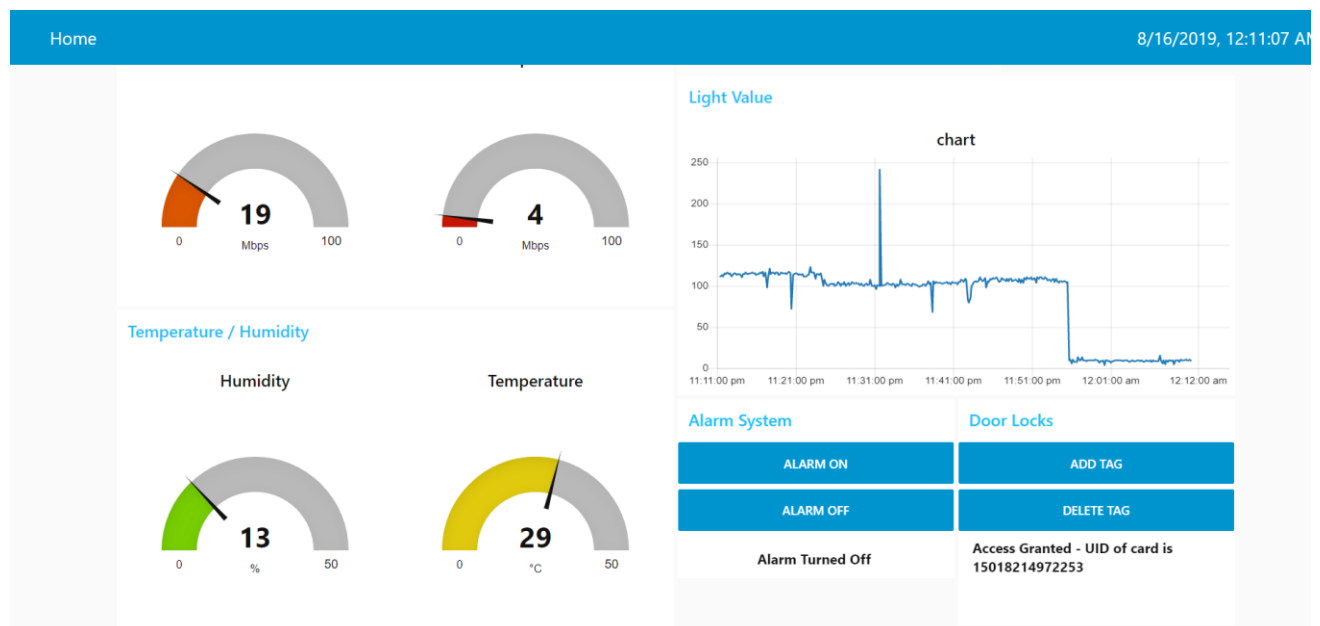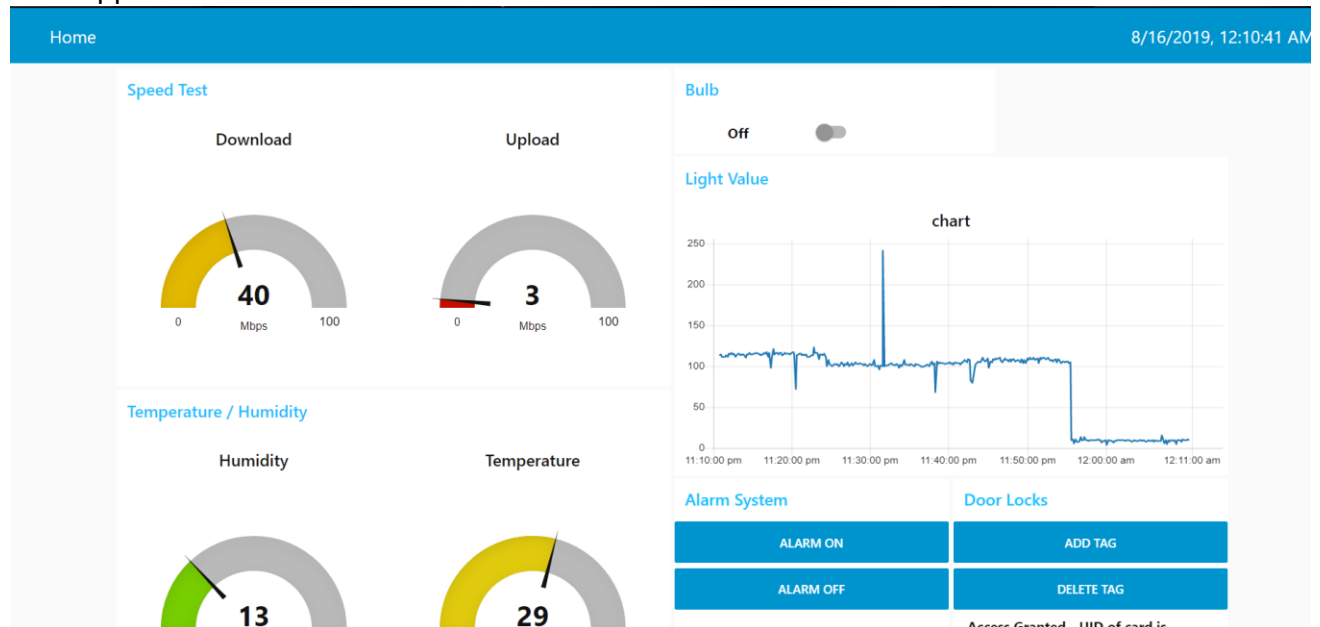
B.　What is the application about?

Our application aims to assist users in life. Our application has a wifi speed test, motion sensor, light detector, card reader and temperature sensor. Users can on and off their room light from the dashboard which is very convenient if the user feels that the room is dark and find their switch really far from their seats. The wifi speed test is there to ensure user has a stable connection at all times and when the wifi speed drops user will be able to see from the gauge and save their data before they get disconnected and lose all their progress. The temperature sensor is to tell user what is the temperature outside like and users will be able to gauge if it is a sunny day or a cloudy day. The card reader is to unlock the house door. Lastly, the motion senser allows user to on the alarm which will trigger when it detects motion and then the user will receive an image on their telegram and email, and a message from twilio saying that there is and intruder

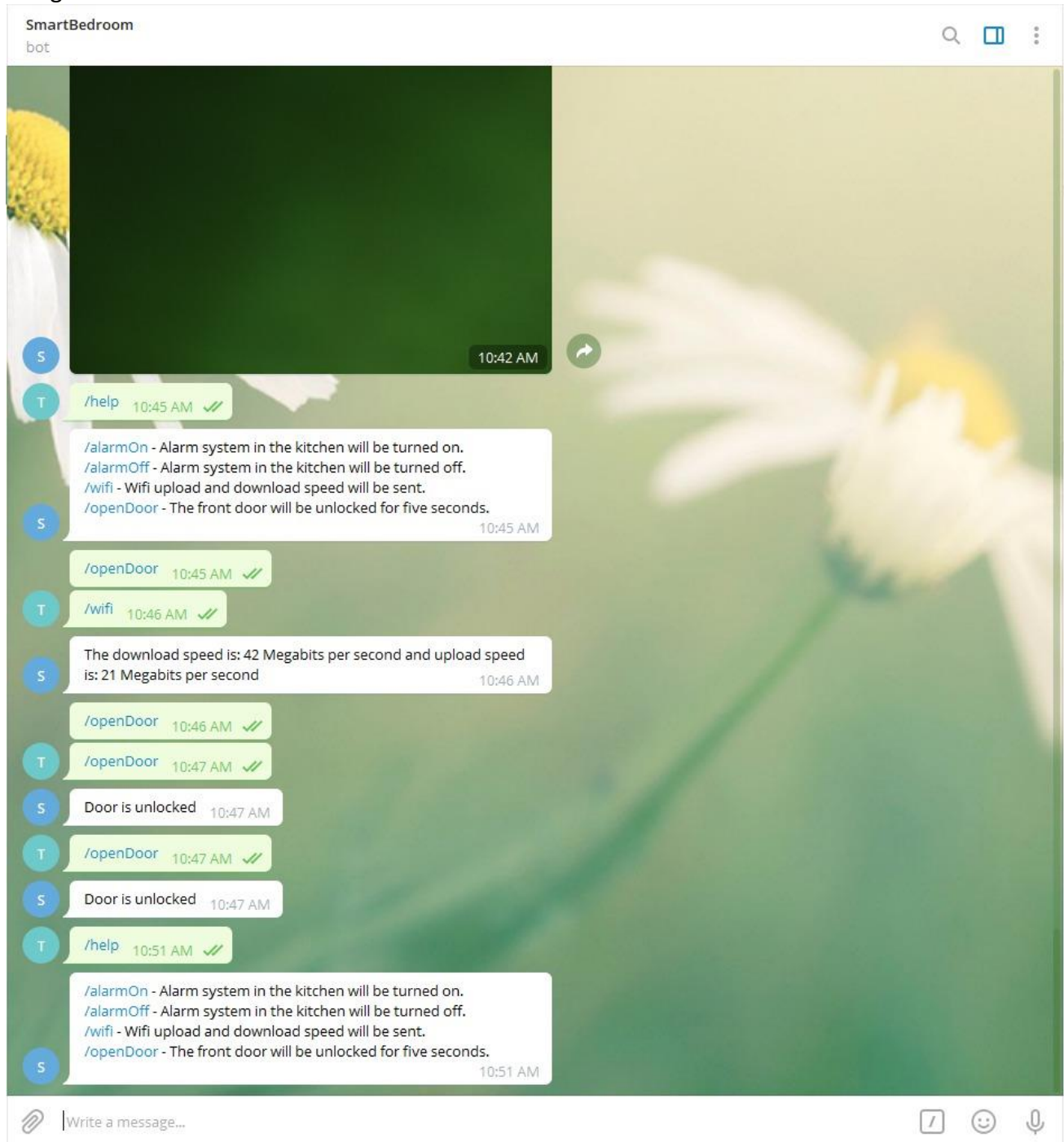## C.　How does the final RPI set-up looks like?

Provide a photo of your final RPI set-up

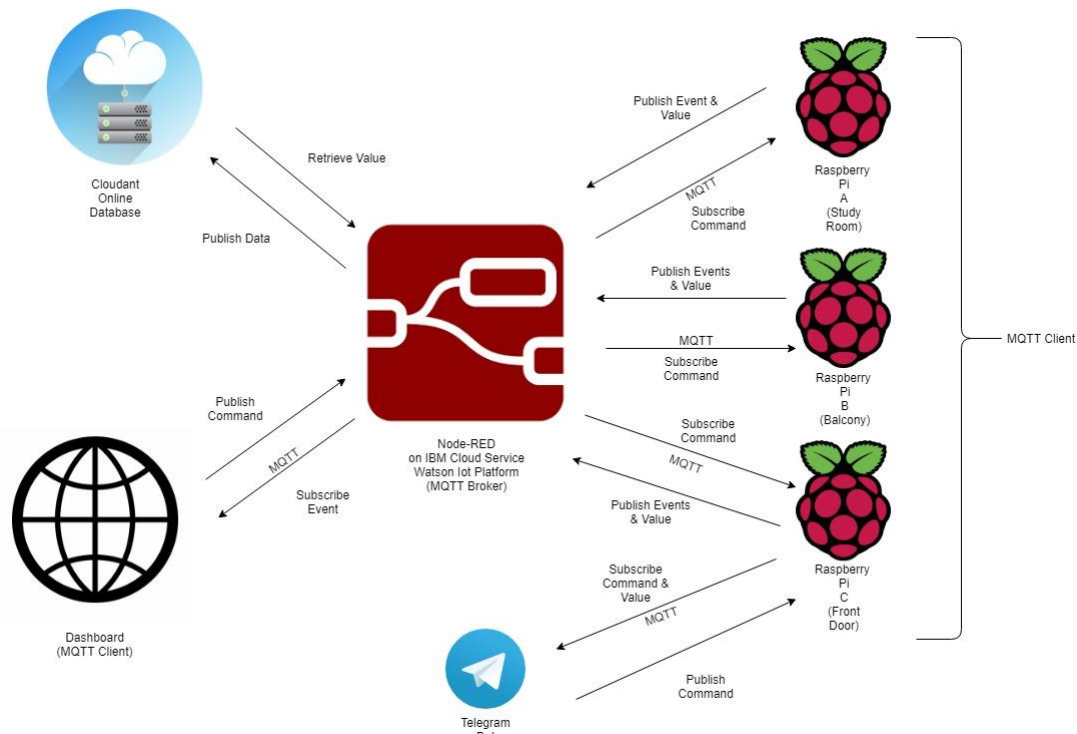# D. How does the web or mobile application look like?

Web App

TelegramBot

E. System architecture of our system

Provide a hand-drawn or computer-drawn system architecture diagram please. Example given below.

F. Evidence that we have met basic requirements

Provide bullet list to describe how your group has met basic requirements

Requirement	Evidence
Used three sensors	Used light sensor, wifi adapter, temperature sensor, motion sensor
Used MQTT	Our MQTT endpoint. Examples will be speedtest-download, speedtest-upload. Example of data sent through MQTT : Light value, Temperature value, Wifi Speed value
Stored data in cloud	Stored light data in Cloudant database in IBM cloud
Used cloud service	Hosted web server on ibm
Provide real-time sensor value / status	Show the real-time value of temperature sensor and wifi adapter
Provide historical sensor value/ status	Show historical value of light sensor
Control actuator	Placed button on webpage to control light bulb

G.   Bonus features on top of basic requirements

Provide bullet list of the bonus features you have added on top of basic requirements

- a)   Telegram bot can check wifi speed by pulling data from IBM
- b)   Telegram bot can activate alarm.
- c)   Telegram will receive image when motion is detected.
- d)   Email will receive image when motion is detected.
- e)   Twilio will message user that there is intruder.

A.   Quick-start guide (Readme first)

Give a few lines of basic instructions on how I need to run your app, e.g

1) First connect hardware as in Section 3 for Raspberry Pi A, B and C.
2) Install nodes needed after copying the codes for the node red to separate devices. Copy code A for Raspberry Pi A's node red, code B for Raspberry Pi B's node red, code C for Raspberry Pi C's node red and Code IBM to IBM's node red.
3) Create gateways and add a device for each gateway.
4) Authenticate the 3 different Raspberry Pi and each Pi will be linked to one gateway and one gateway can only be linked to one Raspberry Pi.
5) Change all watson iot output node's credential from all Raspberry Pi and connect them with IBM's node red.
6) Change all watson iot input and output nodes from IBM respectively to the Raspberry Pi that sends out the values to IBM or takes the values from IBM.
7) Create databases from cloudant with names 'download', 'upload', 'access', 'light', 'temp' and 'hum'.
8) Select the service from the cloudant node to your own cloudant service
9) Reconfigure telegram nodes with your own Bot-Name, Token, User and Chat Id
10) Reconfigure email node and add your own email.
11) Reconfigure twilio and use your own account and add your own phone number.
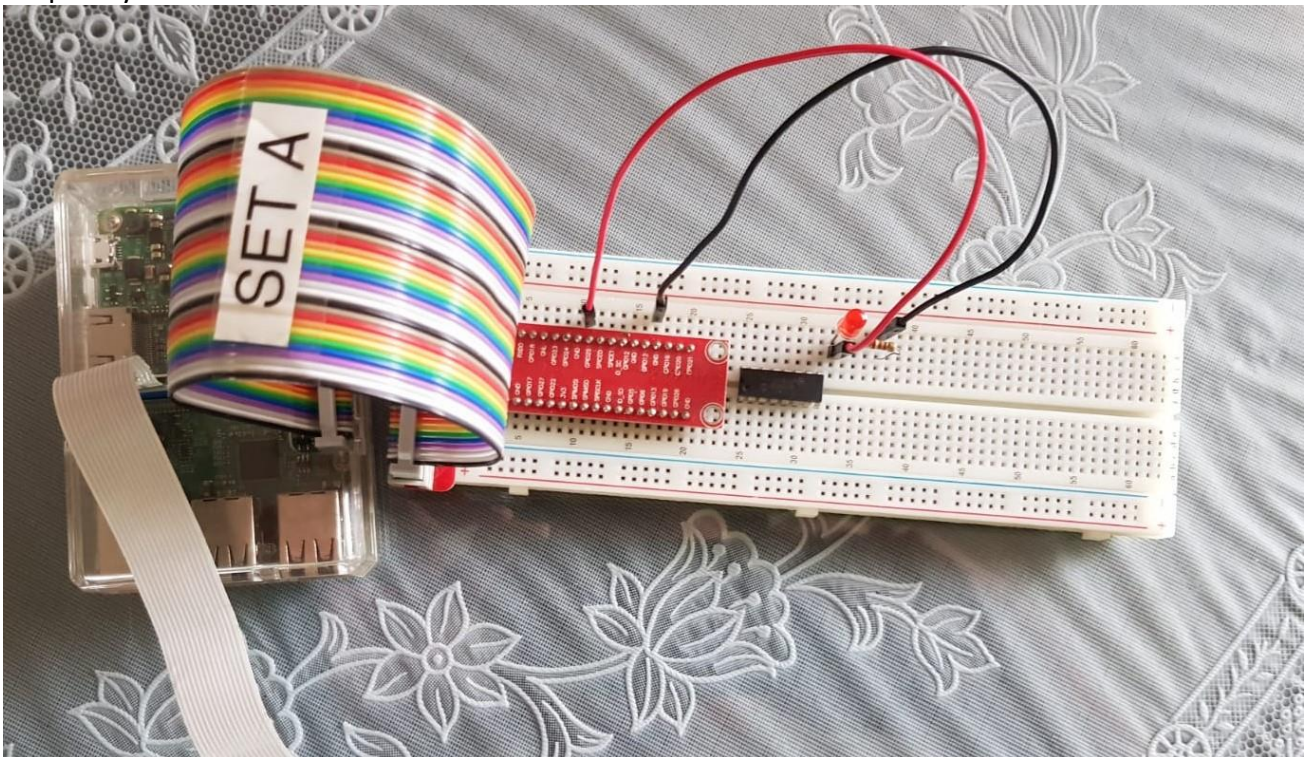
Section 2
Hardware requirements

Hardware checklist

5 Bulb, 1 DHT 11, 1 LDR, 1 Motion Sensor, 1 Buzzer, 1 RFID reader, 1 RFID card,
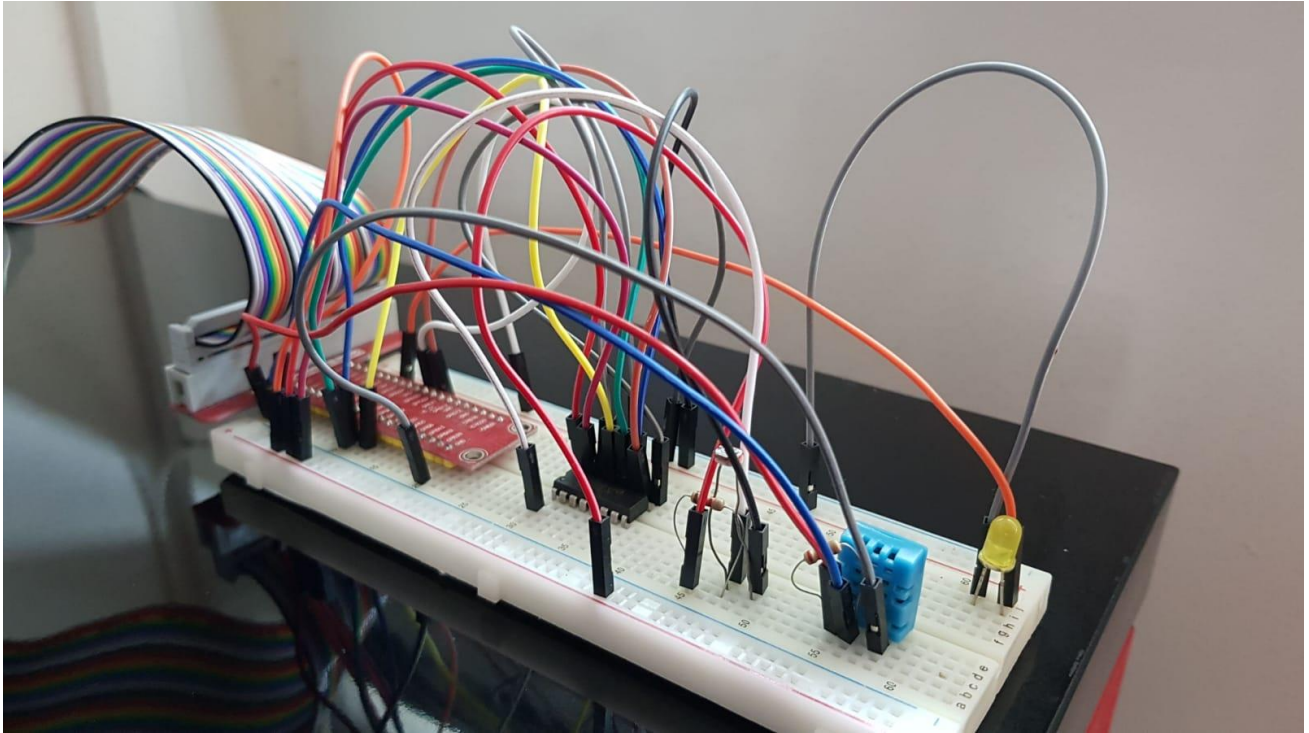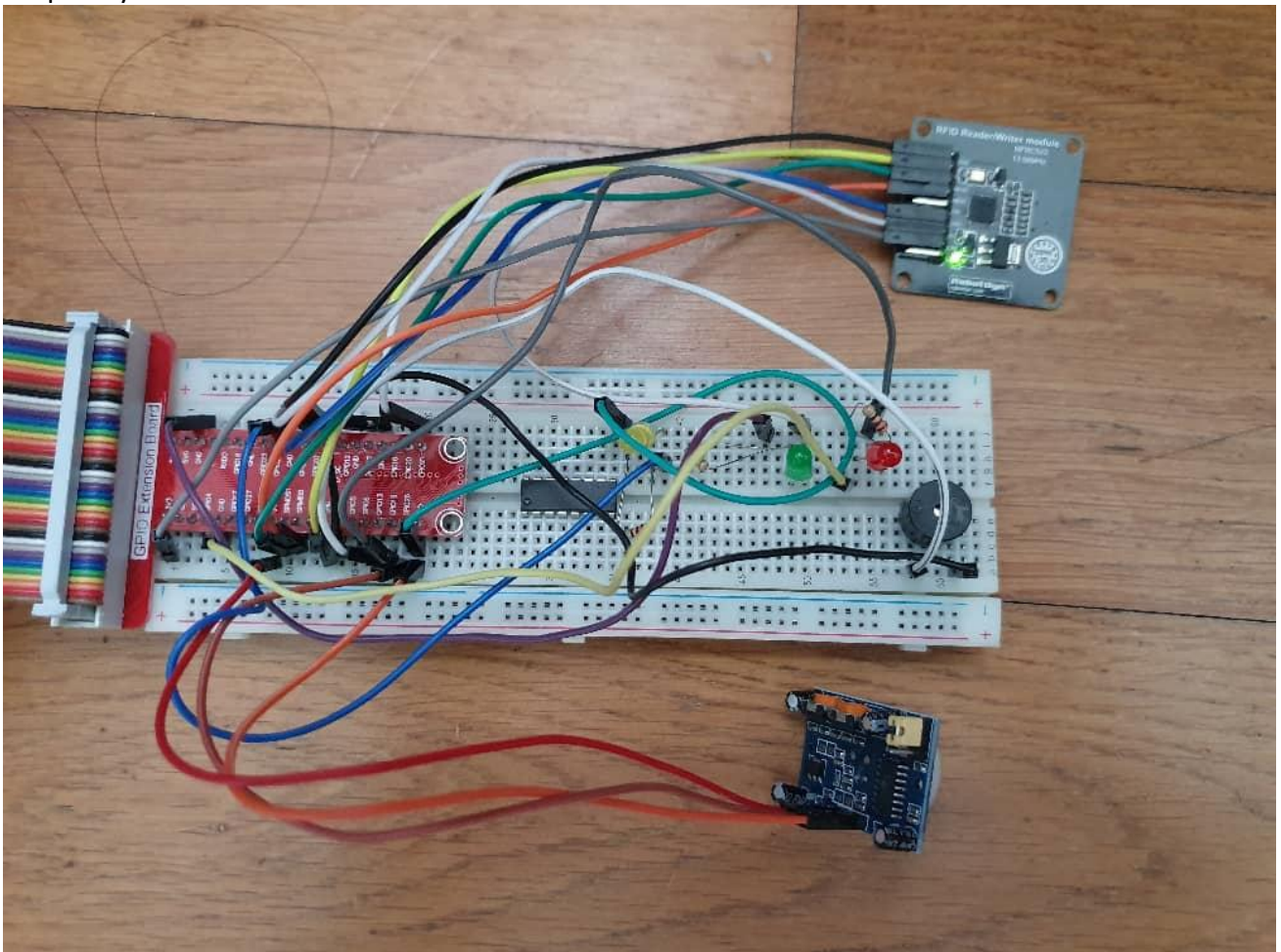3 Raspberry Pi 3 Model B set with NoIR Camera Board

Section 3
Setup

Raspberry Pi A

Raspberry Pi B

Raspberry Pi C

Section 4
Node red codes

Raspberry Pi A's Node Red Code:

[{"id":"13a78b57.773d35","type":"tab","label":"Raspberry Pi A","disabled":false,"info":""},{"id":"7498066b.0fd4b8","type":"inject","z":"13a78b57.773d35","name":"Poll for internet speed every 15s","topic":"","payload":"","payloadType":"date","repeat":"15","crontab":"","once":false,"onceDelay":0.1,"x":180,"y":60,"wires":[["46536ca5.b4cff4"]]},{"id":"b80eb915.d38688","type":"function","z":"13a78b57.773d35","name":"set download values","func":"var download = msg.payload.speeds.download;\n\nmsg.payload = Math.ceil(download);\nglobal.set('downloadval', msg.payload)\nreturn msg;","outputs":1,"noerr":0,"x":580,"y":80,"wires":[["f5320a92.50f7b8"]]},{"id":"ffc8b466.bd1238","type":"inject","z":"13a78b57.773d35","name":"Send upload value to Bluemix","topic":"","payload":"","payloadType":"date","repeat":"30","crontab":"","once":false,"onceDelay":0.1,"x":670,"y":160,"wires":[["43d9f408.fbdb4c"]]},{"id":"43d9f408.fbdb4c","type":"function","z":"13a78b57.773d35","name":"Format msg for speedtest","func":"speed2 = global.get('uploadval')\nmsg.payload = speed2\nreturn msg;","outputs":1,"noerr":0,"x":650,"y":220,"wires":[["8bea1e7a.778d3","39402e8f.f6ca22"]]},{"id":"f5320a92.50f7b8","type":"debug","z":"13a78b57.773d35","name":"","active":true,"tosidebar":true,"console":false,"tostatus":false,"complete":"payload","targetType":"msg","x":770,"y":80,"wires":[]},{"id":"8bea1e7a.778d3","type":"debug","z":"13a78b57.773d35","name":"","active":true,"tosidebar":true,"console":false,"tostatus":false,"complete":"false","x":870,"y":280,"wires":[]},{"id":"739f96c.1fe7868","type":"inject","z":"13a78b57.773d35","name":"Send download value to Bluemix","topic":"","payload":"","payloadType":"date","repeat":"30","crontab":"","once":false,"onceDelay":0.1,"x":180,"y":160,"wires":[["15875458.e7b1bc"]]},{"id":"15875458.e7b1bc","type":"function","z":"13a78b57.773d35","name":"Format msg for speedtest","func":"speed1 = global.get('downloadval')\nmsg.payload = speed1\nreturn msg;","outputs":1,"noerr":0,"x":150,"y":220,"wires":[["9c521b1e.3d2cd8","f78a0afc.c678e8"]]},{"id":"9c521b1e.3d2cd8","type":"debug","z":"13a78b57.773d35","name":"","active":true,"tosidebar":true,"console":false,"tostatus":false,"complete":"false","x":370,"y":280,"wires":[]},{"id":"ceb9174a.f3add8","type":"function","z":"13a78b57.773d35","name":"set upload values","func":"var upload = msg.payload.speeds.upload;\n\nmsg.payload = Math.ceil(upload);\nglobal.set('uploadval', msg.payload)\n\nreturn msg;","outputs":1,"noerr":0,"x":570,"y":40,"wires":[["494cd6e1.b66318"]]},{"id":"494cd6e1.b66318","type":"debug","z":"13a78b57.773d35","name":"","active":true,"tosidebar":true,"console":false,"tostatus":false,"complete":"payload","targetType":"msg","x":770,"y":40,"wires":[]},{"id":"de2a6cb3.e1b37","type":"rpi-gpio out","z":"13a78b57.773d35","name":"LED","pin":"22","set":true,"level":"0","freq":"","out":"out","x":590,"y":360,"wires":[]},{"id":"c71af0a1.30e7f","type":"debug","z":"13a78b57.773d35","name":"","active":true,"tosidebar":true,"console":false,"tostatus":false,"complete":"false","x":610,"y":400,"wires":[]},{"id":"caaaebb3.f80f48","type":"function","z":"13a78b57.773d35","name":"Filter the

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"y":60,"wires":[["b80eb915.d38688","ceb9174a.f3add8"]]},{"id":"d4514f9a.ef6cf","type":"wiotp
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d":"","command":"Bulb","commandType":"g","qos":"1","name":"Listen to LED command from
IBM","x":170,"y":360,"wires":[["caaaebb3.f80f48"]]},{"id":"39402e8f.f6ca22","type":"wiotp
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upload","format":"String","qos":"1","name":"Sending To
IBM","x":620,"y":280,"wires":[]},{"id":"f78a0afc.c678e8","type":"wiotp
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f4d","deviceType":"gw-p1804375","deviceId":"gwid-p1804375","event":"speedtest-
download","format":"String","qos":"1","name":"Sending To
IBM","x":120,"y":280,"wires":[]},{"id":"4615215c.6cf4d","type":"wiotp-
credentials","z":"","name":"","org":"k6be3c","serverName":"k6be3c.messaging.internetofthings.ib
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Raspberry Pi B's Node Red Code:

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secs","topic":"","payload":"","payloadType":"date","repeat":"","crontab":"","once":false,"onceDela
y":0.1,"x":130,"y":80,"wires":[["fcc6e6bc.4af258"]]},{"id":"fcc6e6bc.4af258","type":"pimcp3008","z
":"c03da4a.c92c858","name":"","dev":"3008","pin":0,"dnum":0,"bus":0,"x":390,"y":80,"wires":[["1
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a9","deviceType":"gw-p1828555","deviceId":"gwid-
p1828555","event":"light","format":"json","qos":"0","name":"Send Light Value to
IBM","x":790,"y":200,"wires":[]},{"id":"478ac592.37374c","type":"debug","z":"c03da4a.c92c858","n
ame":"","active":true,"tosidebar":true,"console":false,"tostatus":false,"complete":"payload","targe
tType":"msg","x":750,"y":260,"wires":[]},{"id":"91a8f62c.bd2d08","type":"function","z":"c03da4a.c
92c858","name":"format the msg","func":"light = global.get('light')\nmsg.payload = {'d': {'light':
light}}\nreturn
msg;\n","outputs":1,"noerr":0,"x":400,"y":220,"wires":[["2b9fec80.d9e214"]]},{"id":"fa35ee58.353
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Delay":0.1,"x":150,"y":220,"wires":[["91a8f62c.bd2d08"]]},{"id":"2b9fec80.d9e214","type":"json","
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ires":[["c0051b6a.ffae68","478ac592.37374c"]]},{"id":"256cef5f.c68f5","type":"debug","z":"c03da4
a.c92c858","name":"","active":true,"tosidebar":true,"console":false,"tostatus":false,"complete":"tr
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dht22","z":"c03da4a.c92c858","name":"","topic":"rpi-
```

dht22","dht":"11","pintype":"0","pin":4,"x":380,"y":340,"wires":[["256cef5f.c68f5","d503cdd2.319 38","9adac46d.7a18f8"]]},{"id":"a8ab7be.74c0388","type":"debug","z":"c03da4a.c92c858","name": "","active":true,"tosidebar":true,"console":false,"tostatus":false,"complete":"false","x":730,"y":440 ,"wires":[]},{"id":"a6da5c31.630e9","type":"debug","z":"c03da4a.c92c858","name":"","active":true, "tosidebar":true,"console":false,"tostatus":false,"complete":"false","x":710,"y":560,"wires":[]},{"id" :"d503cdd2.31938","type":"function","z":"c03da4a.c92c858","name":"humidity","func":"msg.paylo ad=msg.humidity;\nreturn msg;","outputs":1,"noerr":0,"x":520,"y":500,"wires":[["a6da5c31.630e9","4915662a.554eb8"]]},{"id" :"12e946d2.5d1ae9","type":"wiotp out","z":"c03da4a.c92c858","authType":"g","qs":"false","qsDeviceId":"","deviceKey":"bafc303a.c5c a9","deviceType":"gw-p1828555","deviceId":"gwid-p1828555","event":"temperature","format":"String","qos":"0","name":"Send Temperature Value to IBM","x":790,"y":380,"wires":[]},{"id":"4915662a.554eb8","type":"wiotp out","z":"c03da4a.c92c858","authType":"g","qs":"false","qsDeviceId":"","deviceKey":"bafc303a.c5c a9","deviceType":"gw-p1828555","deviceId":"gwid-p1828555","event":"humidity","format":"String","qos":"0","name":"Send humidity Value to IBM","x":760,"y":500,"wires":[]},{"id":"9adac46d.7a18f8","type":"function","z":"c03da4a.c92c858", "name":"temperature","func":"msg.payload =msg.payload\nreturn msg;","outputs":1,"noerr":0,"x":550,"y":420,"wires":[["a8ab7be.74c0388","12e946d2.5d1ae9"]]},{" id":"5c4798f8.c065a8","type":"inject","z":"c03da4a.c92c858","name":"poll for light values every 5 secs","topic":"","payload":"","payloadType":"date","repeat":"5","crontab":"","once":false,"onceDel ay":0.1,"x":160,"y":340,"wires":[["b102330b.c2bf3"]]},{"id":"bd48a069.ace49","type":"wiotp in","z":"c03da4a.c92c858","authType":"g","deviceKey":"bafc303a.c5ca9","deviceType":"","deviceId ":"","command":"led","commandType":"g","qos":0,"name":"Recieve LED Status FROM IBM","x":150,"y":620,"wires":[["fc261bd5.064838"]]},{"id":"fc261bd5.064838","type":"function","z ":"c03da4a.c92c858","name":"Convert","func":"msg.payload = msg.payload.led\nreturn msg;\n","outputs":1,"noerr":0,"x":360,"y":620,"wires":[["c6593605.fb1da8","389ff4f4.aa3f8c"]]},{"i d":"389ff4f4.aa3f8c","type":"debug","z":"c03da4a.c92c858","name":"","active":true,"tosidebar":tr ue,"console":false,"tostatus":false,"complete":"false","x":570,"y":620,"wires":[]},{"id":"c6593605.fb 1da8","type":"rpi-gpio out","z":"c03da4a.c92c858","name":"LED OUTPUT","pin":"12","set":false,"level":"0","freq":"","out":"out","x":580,"y":680,"wires":[]},{"id":"b afc303a.c5ca9","type":"wiotp-credentials","z":"","name":"My Raspberry Pi Gateway","org":"k6be3c","serverName":"k6be3c.messaging.internetofthings.ibmcloud.com","devT ype":"gw-p1828555","devId":"gwid-p1828555","keepalive":"60","cleansession":true,"tls":"","usetls":false}]

Raspberry Pi C's Node Red Code:

[{"id":"88adc5ee.65ea88","type":"tab","label":"Telegram Bot and Alarm System","disabled":false,"info":""},{"id":"ee0b8aa6.b73c38","type":"rpi-gpio in","z":"88adc5ee.65ea88","name":"motion","pin":"37","intype":"tri","debounce":"25","read":true, "x":90,"y":160,"wires":[["25d8bb36.db2334","a8787a4d.0d8be8","dbe6c2f6.59152"]]},{"id":"8eb3f 2b.19cc91","type":"debug","z":"88adc5ee.65ea88","name":"","active":true,"tosidebar":true,"conso le":false,"tostatus":false,"complete":"payload","targetType":"msg","x":770,"y":100,"wires":[]},{"id": "b633a6a1.f08d08","type":"rpi-gpio out","z":"88adc5ee.65ea88","name":"","pin":"12","set":true,"level":"0","freq":"","out":"out","x":78 0,"y":40,"wires":[]},{"id":"25d8bb36.db2334","type":"trigger","z":"88adc5ee.65ea88","op1":"1","op 2":"0","op1type":"str","op2type":"str","duration":"10","extend":true,"units":"s","reset":"","name":

"","x":410,"y":40,"wires":[["b633a6a1.f08d08"]]},{"id":"a8787a4d.0d8be8","type":"function","z":"88adc5ee.65ea88","name":"Send 1 if motion is detected","func":"motion = msg.payload;\nif (motion == 1){\nreturn msg;\n}","outputs":"2","noerr":0,"x":460,"y":160,"wires":[["8eb3f2b.19cc91"],[]]},{"id":"17827811.f1b2b8","type":"inject","z":"88adc5ee.65ea88","name":"","topic":"button","payload":"1","payloadType":"num","repeat":"","crontab":"","once":false,"onceDelay":"","x":100,"y":240,"wires":[["dbe6c2f6.59152"]]},{"id":"dbe6c2f6.59152","type":"function","z":"88adc5ee.65ea88","name":"Alarm On Off Logic","func":"context.motion = context.motion || 0;\ncontext.button = context.button || 0;\n\nif (msg.topic === 'button') {\n context.button = msg.payload;\n} else {\n context.motion = msg.payload;\n}\n\nif (context.motion == 1 && context.button == 1) {\n return msg;\n}","outputs":1,"noerr":0,"x":910,"y":240,"wires":[["c902727a.a94c7","1859c3d8.f4240c","13f518ba.50c047"]]},{"id":"505adb39.2bb4d4","type":"inject","z":"88adc5ee.65ea88","name":"","topic":"button","payload":"0","payloadType":"num","repeat":"","crontab":"","once":false,"x":100,"y":280,"wires":[["dbe6c2f6.59152"]]},{"id":"6793a51a.ba16fc","type":"rpi-gpio out","z":"88adc5ee.65ea88","name":"Buzzer","pin":"33","set":true,"level":"0","out":"out","x":1380,"y":240,"wires":[]},{"id":"c902727a.a94c7","type":"trigger","z":"88adc5ee.65ea88","op1":"1","op2":"0","op1type":"str","op2type":"str","duration":"1","extend":true,"units":"s","reset":"","name":"","x":1120,"y":240,"wires":[["6793a51a.ba16fc"]]},{"id":"ccd8fac4.c61cb8","type":"camerapi-takephoto","z":"88adc5ee.65ea88","filemode":"1","filename":"foto.jpeg","filedefpath":"0","filepath":"/home/pi/Pictures/","fileformat":"jpeg","resolution":"3","rotation":"0","fliph":"0","flipv":"0","brightness":"50","contrast":"0","sharpness":"0","quality":"80","imageeffect":"none","exposuremode":"auto","iso":"0","agcwait":"1.0","led":"0","awb":"auto","name":"Take photo","x":1390,"y":340,"wires":[["6717e098.5b241","2ccf2c0b.0ff9e4","560ab77e.b3ba38","c706661d.66c738"]]},{"id":"623057e1.3bb918","type":"telegram sender","z":"88adc5ee.65ea88","name":"","bot":"73f1a0a8.7affa","x":2150,"y":340,"wires":[[]]},{"id":"4ec6bce5.530504","type":"function","z":"88adc5ee.65ea88","name":"Send photo","func":"msg.payload = {}\nmsg.payload.chatId = 634903049\nmsg.payload.type = 'photo'\nmsg.payload.content = '/home/pi/Pictures/test.jpeg';\nreturn msg;\n/* type can be one of the following\nphoto\naudio\nvideo\nsticker\nvoice\ndocument\n*/","outputs":1,"noerr":0,"x":1890,"y":340,"wires":[["623057e1.3bb918"]]},{"id":"6717e098.5b241","type":"delay","z":"88adc5ee.65ea88","name":"","pauseType":"delay","timeout":"2","timeoutUnits":"seconds","rate":"1","nbRateUnits":"1","rateUnits":"second","randomFirst":"1","randomLast":"5","randomUnits":"seconds","drop":false,"x":1660,"y":340,"wires":[["4ec6bce5.530504"]]},{"id":"2ccf2c0b.0ff9e4","type":"function","z":"88adc5ee.65ea88","name":"Send alert","func":"msg.payload = {}\nmsg.payload.chatId = 634903049\nmsg.payload.type = 'message'\nmsg.payload.content = 'Intruder detected!';\nreturn msg;\n\n","outputs":1,"noerr":0,"x":1670,"y":520,"wires":[["d890ab26.b7f408"]]},{"id":"d890ab26.b7f408","type":"telegram sender","z":"88adc5ee.65ea88","name":"","bot":"73f1a0a8.7affa","x":2150,"y":520,"wires":[[]]},{"id":"1859c3d8.f4240c","type":"delay","z":"88adc5ee.65ea88","name":"","pauseType":"rate","timeout":"5","timeoutUnits":"seconds","rate":"1","nbRateUnits":"10","rateUnits":"second","randomFirst":"1","randomLast":"5","randomUnits":"seconds","drop":false,"x":1140,"y":340,"wires":[["ccd8fac4.c61cb8"]]},{"id":"6a3fab56.8307e4","type":"telegram command","z":"88adc5ee.65ea88","name":"","command":"/alarmOn","bot":"73f1a0a8.7affa","strict":false,"x":100,"y":400,"wires":[["f9750fc.d26b5f","b4d254a7.7a3108"],[]]},{"id":"f9750fc.d26b5f","type":"function","z":"88adc5ee.65ea88","name":"Activate alarm","func":"msg.topic = 'button'\nmsg.payload = '1'\nreturn

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command","z":"88adc5ee.65ea88","name":"","command":"/alarmOff","bot":"73f1a0a8.7affa","stri
ct":false,"x":100,"y":540,"wires":[["ba161e33.b2eb2","64cf0689.82da48"],[]]},{"id":"ba161e33.b2e
b2","type":"function","z":"88adc5ee.65ea88","name":"Deactivate alarm","func":"msg.topic =
\"button\"\nmsg.payload = '0'\nreturn
msg;","outputs":1,"noerr":0,"x":490,"y":460,"wires":[["dbe6c2f6.59152"]]},{"id":"5d53b897.871058
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Response to user(Alarm Activated)","func":"msg.payload = {}\nmsg.payload.chatId =
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:"88adc5ee.65ea88","name":"Response to user(Help)","func":"msg.payload =
{}\nmsg.payload.chatId = 634903049\nmsg.payload.type = 'message'\nmsg.payload.content =
'/alarmOn - Alarm system in the kitchen will be turned on.\\n/alarmOff - Alarm system in the
kitchen will be turned off.\\n/wifi - Wifi upload and download speed will be sent.\\n/openDoor -
The front door will be unlocked for five seconds.';\nreturn
msg;\n\n","outputs":1,"noerr":0,"x":410,"y":640,"wires":[["5da83faa.3fc7f"]]},{"id":"5da83faa.3fc7f
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alarm from
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off alarm from
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IBM","x":1140,"y":420,"wires":[]},{"id":"8a223c13.0bc78","type":"function","z":"88adc5ee.65ea88"
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IBM","x":170,"y":720,"wires":[["ca94df91.b3128"]]},{"id":"ca94df91.b3128","type":"function","z":"
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IBM's Node Red Code:

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A","disabled":false,"info":""},{"id":"2d231251.1597be","type":"tab","label":"Flow
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data","active":true,"console":"false","complete":"true","x":310,"y":480,"wires":[]},{"id":"80621eff.
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limits","x":610,"y":380,"wires":[["5dad02b7.a252fc"]]},{"id":"8e1706a.f71e8f8","type":"template","
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"json","data":"temp:10","name":"Send to IBM IoT
Platform","service":"registered","x":570,"y":120,"wires":[]},{"id":"5917a925.6a3c08","type":"inject"
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00,"y":120,"wires":[["6b4a591c.014b18"]]},{"id":"6b4a591c.014b18","type":"function","z":"deb0d5
7.1c46528","name":"Device payload","func":"// Thermostat's location:\nvar longitude1 = -
98.49;\nvar latitude1 = 29.42;\n\n// Array of pseudo random temperatures\nvar temp1 =
[15,17,18.5,20,21.5,23,24,22.2,19,18];\n\n// Array of pseudo random relative humidities\nvar
humidity1 = [50,55,61,68,65,60,53,49,45,47];\n\n// Counter to select from array.\nvar counter1 =
context.get('counter1')||0;\ncounter1 = counter1+1;\nif(counter1 > 9) counter1 =
0;\ncontext.set('counter1',counter1);\n\n// Create MQTT message in JSON\nmsg = {\n payload:
JSON.stringify(\n {\n   d:{\n   \"temp\" : temp1[counter1],\n   \"humidity\" :
humidity1[counter1],\n   \"location\" :\n   {\n   \"longitude\" : longitude1,\n
\"latitude\" : latitude1\n   },\n   }\n })\n};\nreturn
msg;\n","outputs":1,"noerr":0,"x":320,"y":120,"wires":[["cbe1a0b7.cd877","805c97ee.3ed9e8"]]},{
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Simulator","info":"Sends simulated device sensor data to IBM Watson IoT Plaform.\n\nCan be
configured to send on click or on an automatic interval.\n\n\n#Prerequisite\nOutput node device
type and device ID need to match a device that it registered in a running IBM Watson IoT Platform
service.\n\n# Watson IoT Platform docs\n[Connecting
devices](https://www.bluemix.net/docs/services/IoT/iotplatform_task.html)","x":100,"y":40,"wires
":[]},{"id":"141b7c7.ad42a84","type":"comment","z":"deb0d57.1c46528","name":"1. Configure
target","info":"","x":550,"y":80,"wires":[]},{"id":"c2dd8ed5.7dd7f","type":"comment","z":"deb0d57
.1c46528","name":"2. Click to send data","info":"To automatically send data:\n1. Change *Repeat*
to interval.\n2. Click Deploy
button.\n","x":110,"y":160,"wires":[]},{"id":"7926c7b2.86d938","type":"comment","z":"deb0d57.1c
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upload","commandType":"","format":"String","name":"Raspberry Pi A's SpeedTest
Upload","service":"registered","allDevices":"","allApplications":"","allDeviceTypes":"","allLogicalInt
erfaces":"","allEvents":"","allCommands":"","allFormats":"","qos":"1","x":160,"y":100,"wires":[["bf
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Raspberry Pi
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c3f008"]]},{"id":"f33ddbef.c3f008","type":"function","z":"2d231251.1597be","name":"Send On/off
Command","func":"light = parseInt(msg.payload.d.light)\nif ((light)<300)\n msg.payload = {'led':
1};\nelse\n msg.payload = {'led': 0};\n\nreturn
msg;\n","outputs":1,"noerr":0,"x":420,"y":60,"wires":[["5ca5f96d.4083f8"]]},{"id":"5ca5f96d.4083f
8","type":"json","z":"2d231251.1597be","name":"","property":"payload","action":"","pretty":false,
"x":590,"y":60,"wires":[["976b9e72.506ab","5da3792d.7d5468"]]},{"id":"976b9e72.506ab","type":"
ibmiot
out","z":"2d231251.1597be","authentication":"boundService","apiKey":"","outputType":"cmd","de
viceId":"gw-p1828555","deviceType":"gw-
p1828555","eventCommandType":"led","format":"json","data":"{}","qos":0,"name":"Send signal to
Raspberry Pi
B","service":"registered","x":790,"y":80,"wires":[]},{"id":"5da3792d.7d5468","type":"debug","z":"2
d231251.1597be","name":"","active":false,"tosidebar":true,"console":false,"tostatus":false,"compl
ete":"payload","targetType":"msg","x":730,"y":40,"wires":[]},{"id":"e0c0b654.2fa838","type":"debu
g","z":"f452e733.427168","name":"","active":true,"tosidebar":true,"console":false,"tostatus":false,
"complete":"payload","targetType":"msg","x":590,"y":280,"wires":[]},{"id":"c24d74fe.9b7c98","typ

e":"ibmiot
in","z":"f452e733.427168","authentication":"boundService","apiKey":"","inputType":"evt","logicalI
nterface":"","ruleId":"","deviceId":"gwid-p1804375","applicationId":"","deviceType":"gw-
p1804375","eventType":"speedtest-
download","commandType":"","format":"String","name":"Raspberry Pi A's SpeedTest
Download","service":"registered","allDevices":"","allApplications":"","allDeviceTypes":"","allLogicalI
nterfaces":"","allEvents":"","allCommands":"","allFormats":"","qos":"1","x":170,"y":360,"wires":[["
6a3fe62f.92dcb8","bdfea489.109e78"]]},{"id":"bf241b3b.946da8","type":"function","z":"f452e733.
427168","name":"upload value","func":"var upload = msg.payload;\n\nmsg.payload =
Math.ceil(upload) + \" Megabits Per Second\";\nglobal.set('uploadval', upload)\nreturn
msg;","outputs":1,"noerr":0,"x":390,"y":40,"wires":[["1d308c5b.727ab4","5810684b.9a61b8"]]},{"i
d":"5810684b.9a61b8","type":"ui_gauge","z":"f452e733.427168","name":"","group":"c5f2b6c0.6b
2b48","order":0,"width":"6","height":"6","gtype":"gage","title":"Upload","label":"Mbps","format":"
{{value}}","min":0,"max":"100","colors":["#d00000","#e6e600","#00c100"],"seg1":"","seg2":"","x":
540,"y":60,"wires":[]},{"id":"5005836f.13019c","type":"ui_gauge","z":"f452e733.427168","name":"
","group":"c5f2b6c0.6b2b48","order":1,"width":"6","height":"6","gtype":"gage","title":"Download"
,"label":"Mbps","format":"{{value}}","min":0,"max":"100","colors":["#d50000","#e6e600","#00d00
0"],"seg1":"","seg2":"","x":580,"y":320,"wires":[]},{"id":"ac9cab49.65ec38","type":"ibmiot
in","z":"2d231251.1597be","authentication":"boundService","apiKey":"","inputType":"evt","logicalI
nterface":"","ruleId":"","deviceId":"gwid-p1828555","applicationId":"","deviceType":"gw-
p1828555","eventType":"light","commandType":"","format":"json","name":"Get light value from
Raspberry Pi
B","service":"registered","allDevices":"","allApplications":"","allDeviceTypes":"","allLogicalInterface
s":"","allEvents":false,"allCommands":"","allFormats":"","qos":0,"x":160,"y":160,"wires":[["879fd4f
6.856588"]]},{"id":"879fd4f6.856588","type":"function","z":"2d231251.1597be","name":"light
value","func":"light = parseInt(msg.payload.d.light)\nmsg.payload =light\nglobal.set('light',
light)\n\nreturn
msg;\n","outputs":1,"noerr":0,"x":380,"y":160,"wires":[["c1299d4c.7dad7"]]},{"id":"e0a91197.744e
","type":"ui_chart","z":"2d231251.1597be","name":"","group":"bfba4656.e918d8","order":2,"widt
h":"12","height":"6","label":"chart","chartType":"line","legend":"false","xformat":"auto","interpola
te":"linear","nodata":"","dot":false,"ymin":"","ymax":"","removeOlder":1,"removeOlderPoints":"","
removeOlderUnit":"3600","cutout":0,"useOneColor":false,"colors":["#1f77b4","#aec7e8","#ff7f0e",
"#2ca02c","#98df8a","#d62728","#ff9896","#9467bd","#c5b0d5"],"useOldStyle":false,"outputs":1,"
x":670,"y":140,"wires":[[]]},{"id":"c1299d4c.7dad7","type":"json","z":"2d231251.1597be","name":"
","property":"payload","action":"","pretty":false,"x":550,"y":160,"wires":[["e0a91197.744e","96799
d14.b7503"]]},{"id":"8e29f55f.c4a8e8","type":"ibmiot
in","z":"2d231251.1597be","authentication":"boundService","apiKey":"","inputType":"evt","logicalI
nterface":"","ruleId":"","deviceId":"gwid-p1828555","applicationId":"","deviceType":"gw-
p1828555","eventType":"temperature","commandType":"","format":"String","name":"Get Temp
value from Raspberry Pi
B","service":"registered","allDevices":"","allApplications":"","allDeviceTypes":"","allLogicalInterface
s":"","allEvents":false,"allCommands":"","allFormats":"","qos":0,"x":160,"y":280,"wires":[["434bc4d
6.4aa99c"]]},{"id":"a7a4dfd1.a17be","type":"ibmiot
in","z":"2d231251.1597be","authentication":"boundService","apiKey":"","inputType":"evt","logicalI
nterface":"","ruleId":"","deviceId":"gwid-p1828555","applicationId":"","deviceType":"gw-
p1828555","eventType":"humidity","commandType":"","format":"String","name":"Get Humidity
value from Raspberry Pi

B","service":"registered","allDevices":"","allApplications":"","allDeviceTypes":"","allLogicalInterface s":"","allEvents":false,"allCommands":"","allFormats":"","qos":0,"x":170,"y":420,"wires":[["68023c5 .d8151c4"]]},{"id":"434bc4d6.4aa99c","type":"function","z":"2d231251.1597be","name":"temp value","func":"var temp = msg.payload;\nmsg.payload= temp\n\nglobal.set('temp', temp)\nreturn msg;","outputs":1,"noerr":0,"x":410,"y":280,"wires":[["28f28cdb.499fc4","6d3bcf9b.59283","fd542 381.dfd"]]},{"id":"68023c5.d8151c4","type":"function","z":"2d231251.1597be","name":"hum value","func":"var hum = msg.payload;\nmsg.payload=hum\nglobal.set('hum', hum)\nreturn msg;","outputs":1,"noerr":0,"x":410,"y":420,"wires":[["88aa214e.2888a","3124cfaa.39828","e10b5 46a.803b68"]]},{"id":"28f28cdb.499fc4","type":"ui_gauge","z":"2d231251.1597be","name":"","grou p":"32309db9.facf42","order":0,"width":"6","height":"6","gtype":"gage","title":"Temperature","lab el":"°C","format":"{{value}}","min":0,"max":"50","colors":["#00b500","#e6e600","#ca3838"],"seg1" :"","seg2":"","x":570,"y":240,"wires":[]},{"id":"88aa214e.2888a","type":"ui_gauge","z":"2d231251.1 597be","name":"","group":"32309db9.facf42","order":2,"width":"6","height":"6","gtype":"gage","ti tle":"Humidity","label":"%","format":"{{value}}","min":0,"max":"50","colors":["#00b500","#e6e600 ","#ca3838"],"seg1":"","seg2":"","x":560,"y":380,"wires":[]},{"id":"6d3bcf9b.59283","type":"debug" ,"z":"2d231251.1597be","name":"","active":false,"tosidebar":true,"console":false,"tostatus":false," complete":"payload","targetType":"msg","x":570,"y":280,"wires":[]},{"id":"3124cfaa.39828","type": "debug","z":"2d231251.1597be","name":"","active":false,"tosidebar":true,"console":false,"tostatus ":false,"complete":"payload","targetType":"msg","x":570,"y":420,"wires":[]},{"id":"f4b0a628.0cae7 8","type":"ui_template","z":"2d231251.1597be","group":"7013c743.8dd5e8","name":"Clock Toolbar","order":2,"width":"0","height":"0","format":"<script id=\"titleScript\" type=\"text/javascript\">\n\n$(function() {\n   if($('.md-toolbar-tools').length != 0){\n loadClock();\n   }else setTimeout(loadClock, 500)\n});\n\nfunction loadClock(){\n $('#clock').remove();\n   var toolbar = $('.md-toolbar-tools');\n   \n   var div = $('<div/>');\n   var p = $('<p/ id=\"clock\">');\n   \n   div.append(p);\n   div[0].style.margin = '5px 5px 5px auto';\n toolbar.append(div);\n\n   function displayTitle(lh) {\n   p.text(lh); \n   }\n   \n   function upTime() {\n   var d = new Date();\n   p.text(d.toLocaleString());\n   }\n\n if(document.clockInterval){ \n   clearInterval(document.clockInterval);\n document.clockInterval = null;\n   }\n   \n   document.clockInterval = setInterval(upTime,1000);\n}\n\n\n</script>","storeOutMessages":false,"fwdInMessages":false,"tem plateScope":"global","x":340,"y":500,"wires":[[]]},{"id":"48c26096.c32f5","type":"function","z":"f45 2e733.427168","name":"input upload speed to cloudant","func":"var upload = msg.payload;\nreturn msg;","outputs":1,"noerr":0,"x":450,"y":160,"wires":[["f6a56695.b95698","8be4306b.7aee9"]]},{"id ":"f6a56695.b95698","type":"cloudant out","z":"f452e733.427168","name":"store upload value","cloudant":"","database":"upload","service":"sp-p1804375-ca2-002- cloudantNoSQLDB","payonly":true,"operation":"insert","x":690,"y":120,"wires":[]},{"id":"8be4306b .7aee9","type":"debug","z":"f452e733.427168","name":"","active":true,"tosidebar":true,"console": false,"tostatus":false,"complete":"payload","targetType":"msg","x":670,"y":160,"wires":[]},{"id":"6a 3fe62f.92dcb8","type":"function","z":"f452e733.427168","name":"input download speed to cloudant","func":"var download = msg.payload;\nreturn msg;","outputs":1,"noerr":0,"x":480,"y":420,"wires":[["14d511eb.08999e","296fbeaf.e17c72"]]},{"i d":"14d511eb.08999e","type":"cloudant out","z":"f452e733.427168","name":"store download value","cloudant":"","database":"download","service":"sp-p1804375-ca2-002- cloudantNoSQLDB","payonly":true,"operation":"insert","x":740,"y":380,"wires":[]},{"id":"296fbeaf. e17c72","type":"debug","z":"f452e733.427168","name":"","active":true,"tosidebar":true,"console" :false,"tostatus":false,"complete":"false","x":710,"y":420,"wires":[]},{"id":"fd542381.dfd","type":"cl

oudant out","z":"2d231251.1597be","name":"","cloudant":"","database":"temp","service":"sp-p1804375-ca2-002-cloudantNoSQLDB","payonly":true,"operation":"insert","x":550,"y":320,"wires":[]},{"id":"e10b546a.803b68","type":"cloudant out","z":"2d231251.1597be","name":"","cloudant":"","database":"hum","service":"sp-p1804375-ca2-002-cloudantNoSQLDB","payonly":true,"operation":"insert","x":550,"y":460,"wires":[]},{"id":"96799d14.b7503","type":"cloudant out","z":"2d231251.1597be","name":"","cloudant":"","database":"light","service":"sp-p1804375-ca2-002-cloudantNoSQLDB","payonly":true,"operation":"insert","x":670,"y":180,"wires":[]},{"id":"492b3e7d.6a6df","type":"ui_button","z":"3af73f5a.cc44e","name":"","group":"a65e5cf7.a2679","order":1,"width":0,"height":0,"passthru":false,"label":"Alarm On","tooltip":"","color":"","bgcolor":"","icon":"","payload":"1","payloadType":"num","topic":"buttonOn","x":80,"y":40,"wires":[["1015b79f.7ee0d8"]]},{"id":"1015b79f.7ee0d8","type":"ibmiot out","z":"3af73f5a.cc44e","authentication":"boundService","apiKey":"","outputType":"cmd","deviceId":"gwid-p1843059","deviceType":"gw-p1843059","eventCommandType":"buttonOn","format":"json","data":"{}","qos":0,"name":"Send signal to Raspberry Pi C to turn on alarm","service":"registered","x":360,"y":40,"wires":[]},{"id":"58a6fa03.d817f4","type":"ui_button","z":"3af73f5a.cc44e","name":"","group":"a65e5cf7.a2679","order":2,"width":0,"height":0,"passthru":false,"label":"Alarm Off","tooltip":"","color":"","bgcolor":"","icon":"","payload":"0","payloadType":"num","topic":"buttonOff","x":80,"y":80,"wires":[["5e71262e.262ec8"]]},{"id":"5e71262e.262ec8","type":"ibmiot out","z":"3af73f5a.cc44e","authentication":"boundService","apiKey":"","outputType":"cmd","deviceId":"gwid-p1843059","deviceType":"gw-p1843059","eventCommandType":"buttonOff","format":"json","data":"{}","qos":0,"name":"Send signal to Raspberry Pi C to turn off alarm","service":"registered","x":360,"y":80,"wires":[]},{"id":"d76abfa3.a3572","type":"ui_text","z":"3af73f5a.cc44e","group":"a65e5cf7.a2679","order":3,"width":0,"height":0,"name":"Display Alarm Status","label":"","format":"{{msg.payload}}","layout":"col-center","x":780,"y":160,"wires":[]},{"id":"b609687e.6f6128","type":"ibmiot in","z":"3af73f5a.cc44e","authentication":"boundService","apiKey":"","inputType":"evt","logicalInterface":"","ruleId":"","deviceId":"gwid-p1843059","applicationId":"","deviceType":"gw-p1843059","eventType":"alarmon","commandType":"","format":"json","name":"Retrieve alarm status from Raspberry Pi C","service":"registered","allDevices":"","allApplications":"","allDeviceTypes":"","allLogicalInterfaces":"","allEvents":"","allCommands":"","allFormats":false,"qos":"0","x":180,"y":140,"wires":[["bf758fbc.6d5c6"]]},{"id":"bf758fbc.6d5c6","type":"function","z":"3af73f5a.cc44e","name":"Parse in alarm status","func":"msg.payload = 'Alarm Turned On'\nreturn msg;\n","outputs":1,"noerr":0,"x":520,"y":140,"wires":[["d76abfa3.a3572"]]},{"id":"f5345bf8.9c3cf8","type":"ui_button","z":"3af73f5a.cc44e","name":"","group":"92338966.751f28","order":1,"width":0,"height":0,"passthru":false,"label":"Add Tag","tooltip":"","color":"","bgcolor":"","icon":"","payload":"true","payloadType":"bool","topic":"AddTag","x":80,"y":260,"wires":[["5354fc32.d6c5d4"]]},{"id":"5354fc32.d6c5d4","type":"ibmiot out","z":"3af73f5a.cc44e","authentication":"boundService","apiKey":"","outputType":"cmd","deviceId":"gwid-p1843059","deviceType":"gw-

p1843059","eventCommandType":"AddTag","format":"json","data":"{}","qos":0,"name":"Send data to Raspberry Pi C to add tag","service":"registered","x":320,"y":260,"wires":[]},{"id":"30c7252e.1edc5a","type":"ui_button", "z":"3af73f5a.cc44e","name":"","group":"92338966.751f28","order":2,"width":0,"height":0,"passthru":false,"label":"Delete Tag","tooltip":"","color":"","bgcolor":"","icon":"","payload":"true","payloadType":"bool","topic":"DelTag","x":570,"y":260,"wires":[["5c286680.1af4d8"]]},{"id":"5c286680.1af4d8","type":"ibmiot out","z":"3af73f5a.cc44e","authentication":"boundService","apiKey":"","outputType":"cmd","deviceId":"gwid-p1843059","deviceType":"gw-p1843059","eventCommandType":"DelTag","format":"json","data":"{}","qos":0,"name":"Send data to Raspberry Pi C to delete tag","service":"registered","x":820,"y":260,"wires":[]},{"id":"701daa3a.75a064","type":"ibmiot in","z":"3af73f5a.cc44e","authentication":"boundService","apiKey":"","inputType":"evt","logicalInterface":"","ruleId":"","deviceId":"gwid-p1843059","applicationId":"","deviceType":"gw-p1843059","eventType":"card","commandType":"","format":"","name":"Retrieve the status of door locks from Raspberry Pi C ","service":"registered","allDevices":"","allApplications":"","allDeviceTypes":false,"allLogicalInterfaces":"","allEvents":false,"allCommands":"","allFormats":"","qos":0,"x":210,"y":420,"wires":[["93bb7ce.2d0c08"]]},{"id":"77d7aeb8.4d123","type":"ui_text","z":"3af73f5a.cc44e","group":"92338966.751f28","order":6,"width":0,"height":0,"name":"Display the access status and tag ID","label":"","format":"{{msg.payload}}","layout":"row-spread","x":890,"y":440,"wires":[]},{"id":"7355c4e9.cc316c","type":"ibmiot in","z":"3af73f5a.cc44e","authentication":"boundService","apiKey":"","inputType":"evt","logicalInterface":"","ruleId":"","deviceId":"gwid-p1843059","applicationId":"","deviceType":"gw-p1843059","eventType":"alarmoff","commandType":"","format":"json","name":"Retrieve alarm status from Raspberry Pi C","service":"registered","allDevices":"","allApplications":"","allDeviceTypes":"","allLogicalInterfaces":"","allEvents":"","allCommands":"","allFormats":false,"qos":"0","x":180,"y":180,"wires":[["9cf52731.51a938"]]},{"id":"9cf52731.51a938","type":"function","z":"3af73f5a.cc44e","name":"Parse in alarm status","func":"msg.payload = 'Alarm Turned Off'\nreturn msg;\n","outputs":1,"noerr":0,"x":520,"y":180,"wires":[["d76abfa3.a3572"]]},{"id":"93bb7ce.2d0c08","type":"function","z":"3af73f5a.cc44e","name":"Parse in value when a card is tapped","func":"msg.payload = msg.payload.d.value;\nreturn msg;","outputs":1,"noerr":0,"x":570,"y":420,"wires":[["77d7aeb8.4d123","a62eee4f.3788f"]]},{"id":"92354610.6502d8","type":"ui_switch","z":"f452e733.427168","name":"Bulb","label":"","tooltip":" ","group":"876e6c78.dab0b","order":0,"width":"3","height":"1","passthru":true,"decouple":"false","topic":"","style":"","onvalue":"1","onvalueType":"num","onicon":"","oncolor":"","offvalue":"0","offvalueType":"num","officon":"","offcolor":"","x":70,"y":540,"wires":[["fa881b88.2f9f18","cff3d9bd.49bc18"]]},{"id":"13753311.e3a9ad","type":"debug","z":"f452e733.427168","name":"","active":true,"tosidebar":true,"console":false,"tostatus":false,"complete":"false","x":530,"y":520,"wires":[]},{"id":"a62eee4f.3788f","type":"split","z":"3af73f5a.cc44e","name":"","splt":" - UID of card is ","spltType":"str","arraySplt":1,"arraySpltType":"len","stream":false,"addname":"","x":790,"y":400,"wires":[["b8e71d59.241bc"]]},{"id":"b2a77810.475828","type":"ibmiot out","z":"f452e733.427168","authentication":"boundService","apiKey":"","outputType":"cmd","deviceId":"gwid-p1804375","deviceType":"gw-p1804375","eventCommandType":"Bulb","format":"json","data":"{}","qos":"1","name":"Sending to Raspberry Pi

A","service":"registered","x":580,"y":480,"wires":[]},{"id":"b8e71d59.241bc","type":"cloudant out","z":"3af73f5a.cc44e","name":"","cloudant":"","database":"access","service":"sp-p1804375-ca2-002-cloudantNoSQLDB","payonly":true,"operation":"insert","x":910,"y":400,"wires":[]},{"id":"84fb2b1d.f19b58","type":"ibmiot in","z":"3af73f5a.cc44e","authentication":"boundService","apiKey":"","inputType":"evt","logicalInterface":"","ruleId":"","deviceId":"gwid-p1843059","applicationId":"","deviceType":"gw-p1843059","eventType":"addcard","commandType":"","format":"","name":"Retrieve add card status from Raspberry Pi C ","service":"registered","allDevices":"","allApplications":"","allDeviceTypes":false,"allLogicalInterfaces":"","allEvents":false,"allCommands":"","allFormats":"","qos":0,"x":190,"y":320,"wires":[["5d088858.1202d8"]]},{"id":"f2441d9c.be27c","type":"ui_text","z":"3af73f5a.cc44e","group":"92338966.751f28","order":6,"width":0,"height":0,"name":"Display the adding and deleting card process","label":"","format":"{{msg.payload}}","layout":"row-spread","x":870,"y":340,"wires":[]},{"id":"5d088858.1202d8","type":"function","z":"3af73f5a.cc44e","name":"Parse in value when card is added","func":"msg.payload = msg.payload.d.value;\nreturn msg;","outputs":1,"noerr":0,"x":540,"y":320,"wires":[["f2441d9c.be27c"]]},{"id":"690c7d8d.187364","type":"ibmiot in","z":"3af73f5a.cc44e","authentication":"boundService","apiKey":"","inputType":"evt","logicalInterface":"","ruleId":"","deviceId":"gwid-p1843059","applicationId":"","deviceType":"gw-p1843059","eventType":"delcard","commandType":"","format":"","name":"Retrieve delete card status from Raspberry Pi C ","service":"registered","allDevices":"","allApplications":"","allDeviceTypes":false,"allLogicalInterfaces":"","allEvents":false,"allCommands":"","allFormats":"","qos":0,"x":200,"y":360,"wires":[["57916ac7.d37894"]]},{"id":"57916ac7.d37894","type":"function","z":"3af73f5a.cc44e","name":"Parse in value when card is deleted","func":"msg.payload = msg.payload.d.value;\nreturn msg;","outputs":1,"noerr":0,"x":540,"y":360,"wires":[["f2441d9c.be27c"]]},{"id":"fa881b88.2f9f18","type":"function","z":"f452e733.427168","name":"on/off bulb","func":"signal = msg.payload\nif (signal == 1)\n msg.payload = {'led': 1};\nelse\n msg.payload = {'led': 0};\n\nreturn msg;","outputs":1,"noerr":0,"x":210,"y":520,"wires":[["3118d5d.0e43b2a"]]},{"id":"3118d5d.0e43b2a","type":"json","z":"f452e733.427168","name":"","property":"payload","action":"","pretty":false,"x":390,"y":520,"wires":[["b2a77810.475828","13753311.e3a9ad"]]},{"id":"bdfea489.109e78","type":"function","z":"f452e733.427168","name":"download value","func":"var download = msg.payload;\n\nmsg.payload = Math.ceil(download) + \" Megabits Per Second\";\nglobal.set('downloadval', download)\nreturn msg;","outputs":1,"noerr":0,"x":420,"y":300,"wires":[["e0c0b654.2fa838","5005836f.13019c"]]},{"id":"2bf8652b.022eda","type":"function","z":"3af73f5a.cc44e","name":"Parse wifi speed using global.get","func":"var download = global.get('downloadval')\nvar upload = global.get('uploadval')\nmsg.payload = {}\nmsg.payload.chatId = 634903049\nmsg.payload.type = 'message'\nmsg.payload.content = \"The download speed is: \" + Math.ceil(download) + \" Megabits per second\" + \" and upload speed is: \" + Math.ceil(upload) + \" Megabits per second\";\nreturn msg;","outputs":1,"noerr":0,"x":600,"y":480,"wires":[["610fb1ee.b166d"]]},{"id":"610fb1ee.b166d","type":"ibmiot out","z":"3af73f5a.cc44e","authentication":"boundService","apiKey":"","outputType":"cmd","deviceId":"gwid-p1843059","deviceType":"gw-p1843059","eventCommandType":"wifi","format":"json","data":"{}","qos":0,"name":"Send wifi

speed to Raspberry Pi
C","service":"registered","x":900,"y":480,"wires":[]},{"id":"686c699.dbe7a98","type":"ibmiot
in","z":"3af73f5a.cc44e","authentication":"boundService","apiKey":"","inputType":"evt","logicalInt
erface":"","ruleId":"","deviceId":"gwid-p1843059","applicationId":"","deviceType":"gw-
p1843059","eventType":"wifisend","commandType":"","format":"","name":"Retrieve the /wifi
command from Raspberry Pi C's
Telegram","service":"registered","allDevices":"","allApplications":"","allDeviceTypes":false,"allLogic
alInterfaces":"","allEvents":false,"allCommands":"","allFormats":"","qos":0,"x":230,"y":480,"wires":
[["2bf8652b.022eda"]]},{"id":"cff3d9bd.49bc18","type":"function","z":"f452e733.427168","name":"
Setting On Off Text","func":"signal = msg.payload\nif (signal == 1)\n msg.payload = 'On';\nelse\n
msg.payload = 'Off';\n\nreturn
msg;","outputs":1,"noerr":0,"x":230,"y":560,"wires":[["67eb3e90.37889"]]},{"id":"67eb3e90.37889
","type":"ui_text","z":"f452e733.427168","group":"876e6c78.dab0b","order":3,"width":"2","height
":"1","name":"On/Off Text Beside Bulb","label":"","format":"{{msg.payload}}","layout":"row-
spread","x":450,"y":560,"wires":[]}]

-- End of CA2 Step-by-step tutorial --