



IT - ITes SSC
NASSCOM



PERSONAL ASSISTANCE FOR SENIOR WHO ARE SELF RELIANT

IBM – DOCUMENTATION

UNDER THE GUIDANCE OF

INDUSTRY MENTOR(S) NAME : KUMAR JULURI

FACULTY MENTOR(S) NAME : JASHMINE PRIYADHARSHINI B

TEAM ID : PNT2022TMID48412

SUBMITTED BY:

KARTHICK P	913319106301
MOHAMED RASIK A M	913319106017
NANDHAKUMAR C	913319106019
KALIDASS S	913319106009

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

VAIGAI COLLEGE OF ENGINEERING

ANNA UNIVERSITY :: 2019 – 2023

S.NO	TABLE OF CONTENT
1	INTRODUCTION
1.1	PROJECT OVERVIEW
1.2	PURPOSE
2	LITERATURE SURVEY
2.1	EXISTING PROBLEM
2.2	REFERENCES
2.3	PROBLEM STATEMENT DEFINITION
3	IDEATION & PROPOSED SOLUTION
3.1	EMPATHY MAP CANVAS
3.2	IDEATION & BRAINSTORMING
3.3	PROPOSED SOLUTION
3.4	PROBLEM SOLUTION FIT
4	REQUIREMENT ANALYSIS
4.1	FUNCTIONAL REQUIREMENT
4.2	NON-FUNCTIONAL REQUIREMENT
5	PROJECT DESIGN
5.1	DATA FLOW DIAGRAM
5.2	SOLUTION & TECHNICAL ARCHITECTURE
5.3	USER STORIES
6	PROJECT PLANNING & SCHEDULING
6.1	SPRINT PLANNING & ESTIMATION
6.2	SPRINT DELIVERY SCHEDULE
6.3	REPORTS FROM JIRA
7	CODING & SOLUTIONING

7.1	FEATURE 1
7.2	FEATURE 2
7.3	DATABASE SCHEMA
8	TESTING
8.1	TEST CASES
8.2	USER ACCEPTANCE TESTING
9	RESULTS
9.1	PERFORMANCE METRICS
10	ADVANTAGES & DISADVANTAGES
11	CONCLUSION
12	FUTURE SCOPE
13	APPENDIX
13.1	SOURCE CODE
13.2	GITHUB & PROJECT DEMO LINK

Personal assistance for seniors who are self reliant

1.introduction

1.1.project overview

- An app is built for user (caretaker) which enables him to set the desired time and medicine.this details will be stored in the IBM cloud and DB.
- If the medicine time arrives the web application will send the medicine name to the iot device through the IBM iot platform.
- The device will receive the medicine name and notify the user with voice commands

1.2.purpose

- Sometimes elderly people forget to take their medicine at the correct time
- They also forget which medicine he or she should take at the particular time
- And it is difficult for doctors or caretakers to monitor the patient around the clock.to avoid this problem ,this medicine reminder system is developed.

2.literature survey

2.1.Existing problem

Elderly people let slip the medication at the correct time and the existing solutions for this problem is setting reminders or using pill boxes , calenders personal assistance .though the solutions give reminders ,the voice commands or assistance given by the system is more efficient.

2.2.references

1. Visual health reminder :A reminder for medications in take and measuring blood pressure to support elderly people ;Rene Barayani ; Sascha Rainer ; Stefan Schlossarek ; Nadja Ledered ; Thomas Grecheing.
2. Cloud computing based medical assistance & pill reminder ; A. Chinnasamy ; Ram Prasad J ; Syed Rafeeq Ahmed ; Akash S

2.3.problem statement definition

Skipping medicines can be serious for some medical health conditions ; sometimes elderly people forget to take their medicines at the correct time . they also forget which medicine one should take at that particular time .and it is difficult for doctors or care takers to monitor patient around the clock

3.ideation and proposed solution

3.1. Empathy map canvas



3.2.Ideation and brain storming

karthick P

Alert messages regarding the emptied medications.	If senior citizen forgets take the medications then alert messages to care taker or guardians or doctors.	To improve battery optimization (strong).
Focus on nutrients monitoring.	Simple way to reduce the risk of diabetes.	Remain physical activities.

kalidaas s

Connect with others.	Companionship	Accompany them to medical appointments and checkups.
Voice assistance.	Power LED and buzzer (sound quality).	Movement sensor to be used for monitoring their activities.

Mohamed rasik A M

Alarm snoozing facility.	Body temperature monitoring activities (BP,spO2)	Tablet indicating alarm with LED.
To make practice good personal hygiene.	Door access sensor for monitoring.	Display reminder for deaf and dumb senior citizen.

nandha kumar c

Flexible scheduling.	Medication tracking history.	Ability to record and track taken and missed doses.
Available of languages other than ENGLISH.	Customizable alert sounds (availability of different types of medications sounds).	Visualized availability of handling tablet (sympge-trap)



3..3.Proposed solution

S.No.	Parameter	Description
•	Problem Statement (Problem to be solved)	To develop web application and device which to indicate correct medications for senior citizen,taking correct time.
•	Idea / Solution description	This project aims to take correct medication for the senior citizens who are self reliant. Our idea is to remember correct medicine for senior citizen or care taker or their relatives also.
•	Novelty / Uniqueness	Here we use Led and display system to indicate correct medication for senior citizens. This unique feature of this application is easy to use and visualize for taking correct medicine on correct time of senior citizens.
•	Social Impact / Customer Satisfaction	It will help people providing or to indicate correct medications on correct time and helps in maintaining their health actively.
•	Business Model (Revenue Model)	Personal Assistance systems offer a cost effective alternative to in-person care. They allow your parent's to live the same as they enjoy doing at the moment, with the added reassurance that they are safe doing so.
•	Scalability of the Solution	It provides service for the elderly which is monitored 24/7

3.4.Problem solution fit

<p>1. CUSTOMER SEGMENT(S)</p> <p>Who is your customer? Who is your customer? Senior Citizens who are self reliant are the target customers.</p>	<p>6. CUSTOMER CONSTRAINTS</p> <p>What constraints prevent your customers from taking action or limit their choices of solutions? i.e. spending power, budget, no cash, network connection, available devices. The customer must not be hearing impaired since the application will give the voice commands about the medicine and the internet connection is mandatory. A android or an ios device is needed</p>	<p>5. AVAILABLE SOLUTIONS</p> <p>Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? In the past practicing heart healthy lifestyle choices such as exercising, eating a Mediterranean diet, avoiding stress. These are temporary solutions and cannot lead an independent life. Our device promotes their lifestyle by being available all the time with a helping hand.</p>
<p>2. JOBS-TO-BE-DONE / PROBLEMS</p> <p>Which jobs-to-be-done (or problems) do you address for your customers? The senior citizen often tend to forget taking the medicines on time and also the correct amount to be consumed. So this system reminds the elders to take medicines.</p>	<p>9. PROBLEM ROOT CAUSE</p> <p>What is the real reason that this problem exists? What is the back story behind the need to do this job? i.e. customers have to do it because of the change in regulations. Forgetfulness of the elders are the root cause along with the confusion on how much to consume, when to consume, and what medicine to take.</p>	<p>7. BEHAVIOUR</p> <p>What does your customer do to address the problem and get the job done? i.e. directly related: find the right solar panel installer, calculate usage and benefits; indirectly associated: customers spend free time on volunteering work (i.e. Greenpeace) Updating the medicine regularly after the doctors visit and check ups. Updating the applications regularly. Making sure that the speakers are working fine.</p>
<p>3. TRIGGERS</p> <p>What triggers customers to act? i.e. seeing their neighbor installing The senior citizen always find it difficult to take medicines at the prescribed time due to complications that come with old age. The main problem of not taking medicine on time is that it will affect the health and wellbeing and is difficult for the caretakers.</p> <p>4. EMOTIONS: BEFORE / AFTER</p> <p>How do customers feel when they face a problem or a job and afterwards? Before using it the senior citizens and their caretakers are under constant panic mode about the consumption of medicine in its correct measures. Now after this application it became easy for every one and both elders and the care givers can give a peaceful and stress free day</p>	<p>10. YOUR SOLUTION</p> <p>If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality. If you are working on a new business proposition, then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behavior. The memory issue that comes with age happens to be an issue reminding them frequently often tends to do the deed and this application reminds them via a voice note and many senior citizens might be illiterate or lost the ability to read find it easy.</p>	<p>8. CHANNELS of BEHAVIOUR</p> <p>8.1 ONLINE What kind of actions do customers take online? Extract online channels from #7 Through online, the caretakers can get the location of the patient when they are outside also connecting to the server to change the medicine details.</p> <p>8.2 OFFLINE What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development. The data is also stored in the device so when they go away from the care givers they can survive easily and live a healthy</p>

4.Requirement analysis

4.1.Functional requirements

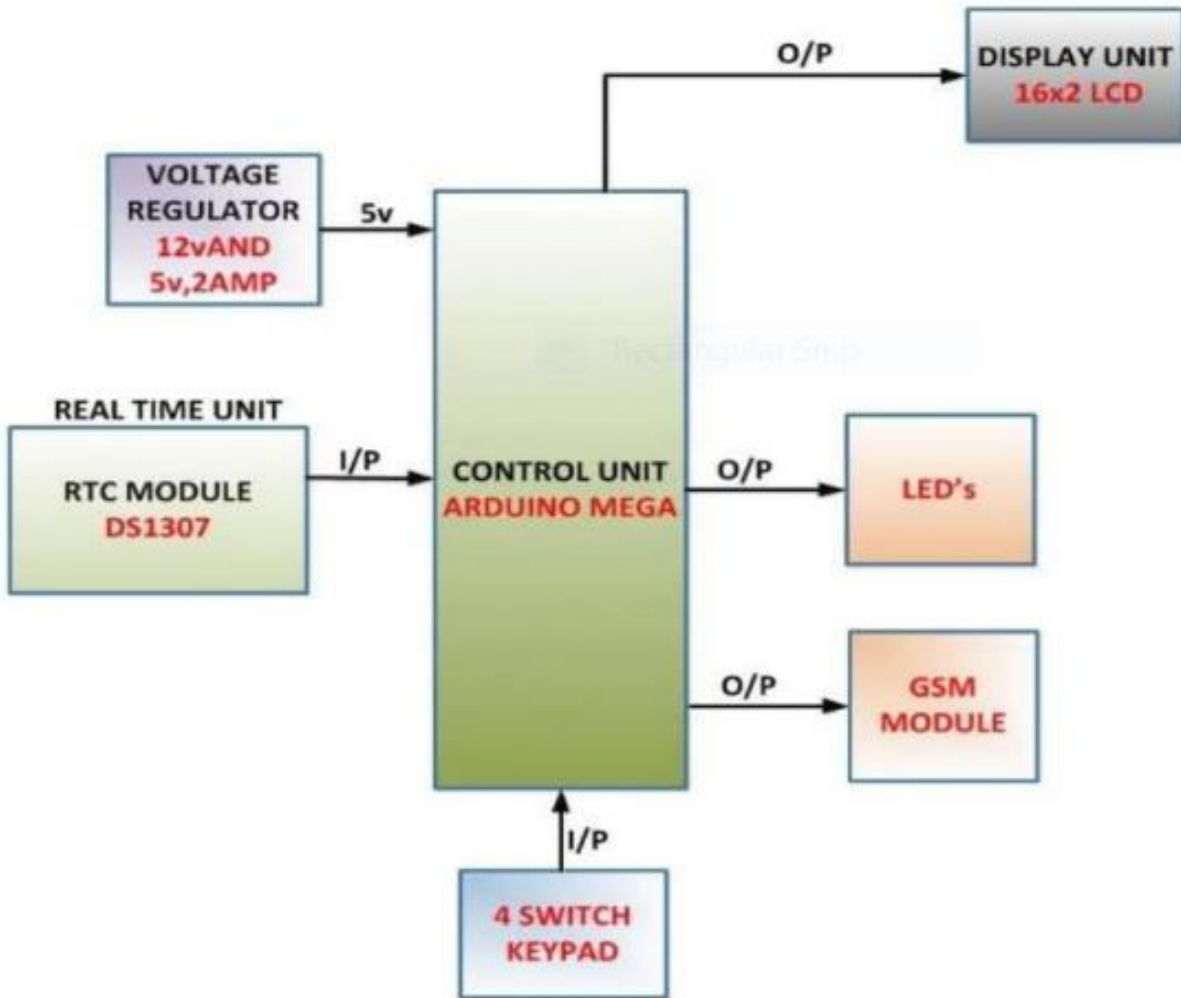
FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail
FR-2	User Confirmation	Confirmation via Email
FR-3	Data adding	Upload all medicine details and timing.
FR-4	Usage	After uploading we can provide them to elderly people.

4.2.Non-functional requirements

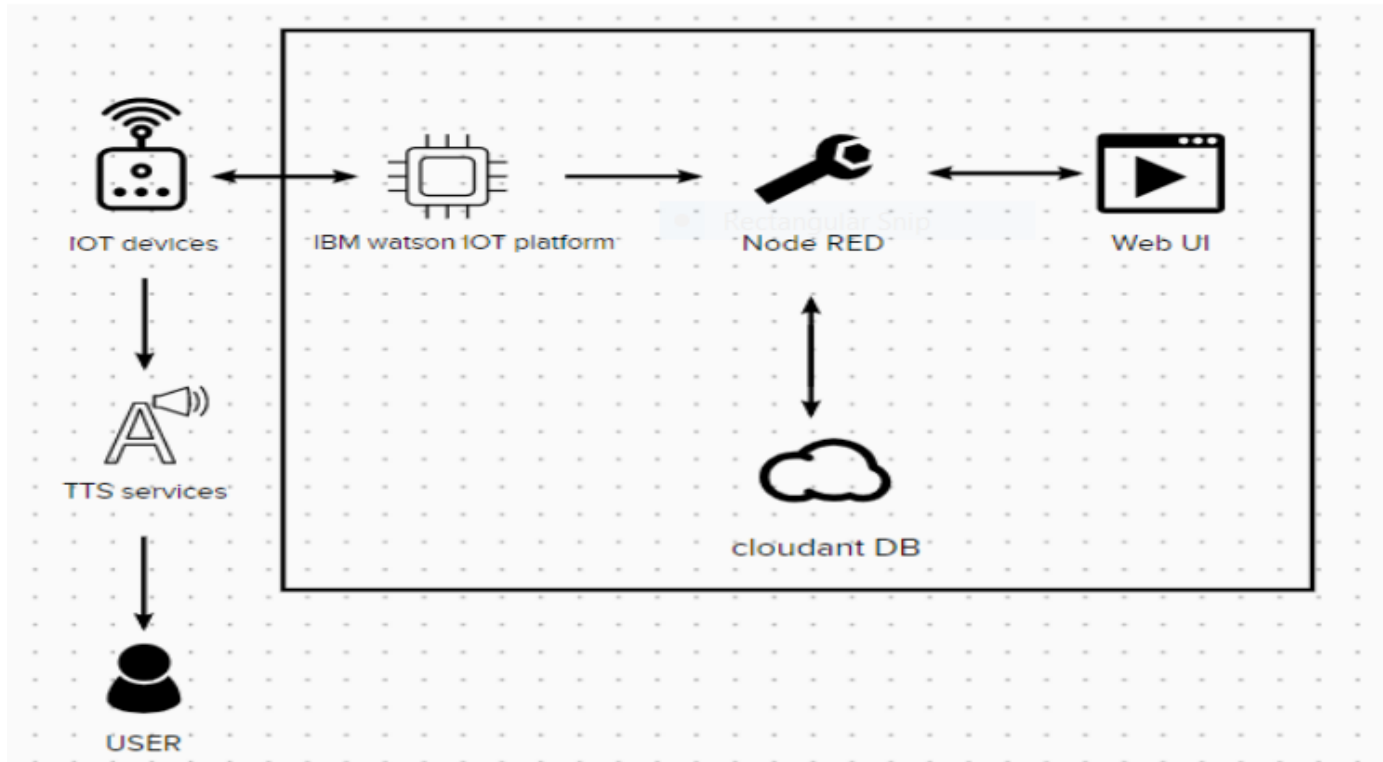
FR No.	Non-Functional Requirement	Description
NFR-1	Usability	It is very easy to use, the main thing is to recharge the device properly.
NFR-2	Security	This dice can also monitor the patient's heart beat rate if specific sensor is attached to the device this is a main safety feature of this device.
NFR-3	Reliability	If the device is charged properly and maintained properly there is no issue with reliability.
NFR-4	Performance	This device does not need any performance it is light weight and runs smoothly.
NFR-5	Availability	According to the patients' needs the device can be prepared and distributed.
NFR-6	Scalability	Medicine varies from people to people but this device can be reprogrammed for any people, this device has high scalability.

5. Project design

5.1. Data flow diagram



5.2.technical architecture



5.3.User stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Care taker)	Details of medicine	USN-1	It is difficult to care an elderly people so a medicine remainder is helpful.	I can do my work without interruption.	High	Sprint-1
Customer (Elderly people)	Details of medicine	USN-2	It is difficult to belong on someone for basic needs.	I can be self reliant.	High	Sprint-1

6. Project planning and scheduling

6.1. Sprint planning and estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story points	Priority	Team Members
Sprint 1	Set Alarm	USN-1	As a user, I can set an alarm to alerting a medicine through medicine remainder system	10	High	Nandhakumar
Sprint 1		USN-2	As a user, I can Activate and Deactivate the alarm	10	High	Nandhakumar
Sprint 2	Notification	USN-3	As a user once I can the set the alarm then I gets the notification	10	High	Mohamed rasik
Sprint 2		USN-4	As a user, If I requires this system then a notification will be sent into his device.	10	High	Mohamed rasik
Sprint 3	Medication Detail	USN-5	As a user, I have multiple medications each day, can put each pill in the box for the corresponding day.	10	High	kalidass

Sprint 3		USN-6	As a user, between setting an alarm and using a pillbox, I'll be able to stay on top of your medications and not miss a dose.	5	low	kalidass
Sprint 3		USN-7	As a user, I can store the name of the medicine with its description	10	High	karthick
Sprint 4	GPS Tracking	USN-8	As a user, they can also help large hospitals and clinics manage their inventory more effectively	5	Low	karthick
	Sensor	USN-9	As a user ,they used for keeping the record in medicine details the reminding the schedule of medicine. We have used the IoT enabled Arduino device for monitoring the System.	10	High	karthick

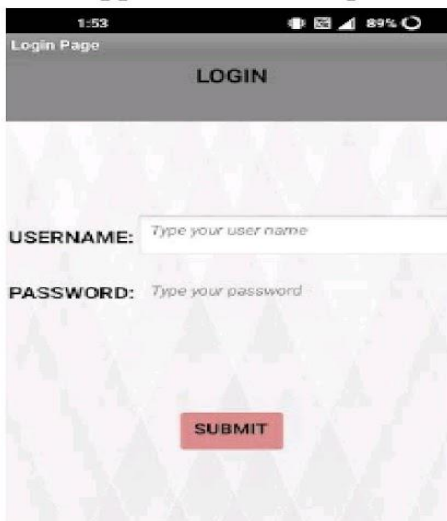
6.2.Sprint delivery schedule

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint 1	20	7 days	12-11-2022	19-11-2022	20	19-11-2022
Sprint 2	10	4 days	15-11-2022	19-11-2022	10	19-11-2022
Sprint 3	20	3 days	16-11-2022	19-11-2022	20	19-11-2022
Sprint 4	10	2 days	17-11-2022	19-11-2022	10	19-11-2022

7. Coding and Solutioning

7.1 Feature 1

The mobile application developed has a feature of individual login by different users.



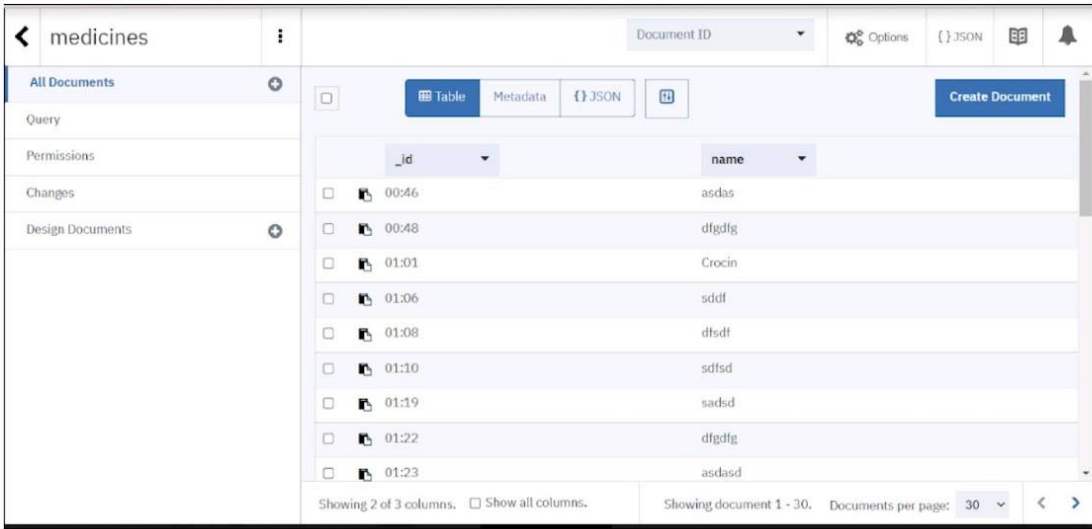
7.2 Feature 2

The mobile application also has the feature of uploading medicine names in the cloud.



7.3. Feature 3

The project includes a cloud database system.



8. Testing

8.1. Test cases

Test case	Precondition	Test steps	Test data	Expected result
Verify login with valid credentials	User should have a network connection	1. Launch URL 2. Enter valid username. 3. Enter valid password. 4. Click on the “Login” button.	Username: Navya Password: 12345	Users should be able to login successfully.
Verify login with invalid credentials	User should have a network connection	1. Launch URL 2. Enter valid username. 3. Enter invalid password. 4. Click on the “Login” button.	Username: Navya Password: Navya123	Users should not be able to login.
Update the medicine name with the time.	User should have a network connection	1. Enter valid medicine name. 2. Enter the time when the medicine has to be consumed. 3. Click on the “Submit” button.	Medicine Name: Cetirizine Medicine Time: 20.00	Users should be able to update it successfully.

9. Results

9.1. Performance Metrics

S. NO	Parameter	Performance
1.	Response Time	0.2s (Average of 10 trials)
2.	Workload	500 users (Calculated based on Cloud Space)
3.	Revenue	Individual users and pharmaceutical industries.
4.	Efficiency	Simple and straightforward workflow, which makes the process efficient.
5.	Down Time	Almost no down time due to IBM Cloud enabled solution.

10. Advantages and Disadvantages

Advantages

- Help the elderly people to take their medicine at the correct time.
- Avoid personal assistants or caretakers needed for medically sick people.
- Cost efficient.
- Can store multiple data and many notifications can be generated.
- Since it includes voice assistance, even blind people can use our device.

Disadvantages

- Makes people lethargic and makes them dependent always on others.
- Requires a stable internet connection.

11. Conclusion

The project offers the elderly or medically sick people a personal assistant which reminds them of the medicines to be consumed at the particular time. Skipping tablets may lead to serious problems if the person has a severe illness and this can be avoided. Since the cloud is integrated with the mobile application, numerous data can be fed into the database and notifications can be generated. The mobile application developed is highly customisable by the user and easy to use.

12. Future Scope

The project can be further developed by bringing into the feature of informing the medicine name during the notification. The voice assistance which is given can be customized by adding the user's voice or the caretaker's voice. Further the mobile application can update medicines by taking voice commands as an input from the user.

13. Appendix

Source Code:

```
#include <WiFi.h>//library for wifi
#include <PubSubClient.h>//library for MQTT
#include "SoundData.h"
#include "XT_DAC_Audio.h"
XT_Wav_Class Sound("voice_command.wav");
XT_DAC_Audio_Class DacAudio(2,0);
uint32_t DemoCounter=0;

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);

//-----credentials of IBM Accounts-----

#define ORG "ut4tn5"//IBM ORGANITION ID
#define DEVICE_TYPE "Arduino"//Device type mentioned in ibm watson IOT Platform
#define DEVICE_ID "nitish123"//Device ID mentioned in ibm watson IOT Platform
#define TOKEN "123456789" //Token
String data3;
float h, t;

//----- Customise the above values -----
char server[] = ORG ".messaging.internetofthings.ibmcloud.com";// Server Name
char publishTopic[] = "iot-2/evt/Data/fmt/json";// topic name and type of event perform and
format in which data to be send
char subscribetopic[] = "iot-2/cmd/test/fmt/String";// cmd REPRESENT command type
AND COMMAND IS TEST OF FORMAT STRING
char authMethod[] = "use-token-auth";// authentication method
char token[] = TOKEN;
```

Demo link : [https://www.mediafire.com/file/heakocu5tnfb11i/VID-20221119-WA0017\[1\].mp4/file](https://www.mediafire.com/file/heakocu5tnfb11i/VID-20221119-WA0017[1].mp4/file)