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IOT Based Safety Gadget For Child Safety Monitoring and Notification

IBM NALAIYATHIRAN

TITLE	IOT Based Safety Gadget For Child Safety Monitoring And Notification
DOMAIN NAME	INTERNET OF THINGS
TEAM ID	PNT2022TMID41271
TEAM LEADERNAME	DHARSHANRAJ V
TEAM MEMBER NAME	CHINNAN S KEERTHIPRASATH S KOUSHIK R P
MENTOR NAME	Dr. DINESH G

CONTENT

1.INTRODUCTION:

Project Overview:

Internet of Things (IoT) is a set of systems and devices interconnected with real-world sensors and actuators to the Internet. It is able to make decisions via detecting the surrounding environment without human interaction. In this project, IoT is applied to propose which helps parents to monitor and get known of their child's condition at anywhere and anytime even if they are not by their children side, Via the IoT , children safety is guaranteed, and crime rate is reduced as immediate actions can be taken in case the child is in danger.The use of IoT in this device is motivated by the need of child security system. Enable tracking of the child's location and capturing of data remotely such as temperature, Latitude and Longitude .To show the child's actual data with reference values. Enable sending of notification if the child is out of location or when the device realizes abnormal conditions/situations. Then, emergency notification will be sent to and display in the parents' mobile apps.Cloud computing means shared computing resources (networks, servers, storages, applications, services) are delivered as a service over the Internet from cloud to parent's. According to cloud is an interconnected network of servers providing services for people. With the help of cloud we store the entire location data.

Purpose:

It assists parents to monitor their children remotely .In case situations happen, notifications will be sent to parents so that actions can be taken. Through this child safety can be ensured and crime rate will be reduced. Parent's concentrate to their works without worrying about their children.

2.LITERATURE SURVEY:

2.1 Existing problem:

Paper 1:

The tracking system is used to track moving individuals and provide an instant timeline of position information for tracking analysis. People Tracking System in the crowd for Smart Cities is a mobile application that allows parents to monitor the location of their children in a crowded environment. Besides children, there are also elderly and disabled people, so the person responsible for them can use this application to track their location. The parents have the application in which they can track the location and on the other hand, the child or the old person or the disabled person has a device that contains the Global Positioning System chip. The main objective of this study is to design an application with the system that will help the parents to track their children to reduce the cases where the children or the other mentioned categories of people might get lost. The current solution to this problem is that the children first have a wearable wrist where they imprint the phone number of their parents so that if the child is lost, there is an office where the child is taken and taken care of until they contact the parents to come and pick up the child. The problem with the current way that it takes time and there is a risk that child will be lost or kidnapped before ever reaching for any help, so the new way is better to also prevent them from going far away or being lost for hours, so the recovery here will be quick unlike the regularly used way today. This goal will be achieved by systematic objectives, starting from studying the existing systems, planning, and analyzing, designing, and implementing, and finally testing the proposed system.

Paper 2:

Recently, all over the world, crime against children is increasing at higher rates and it is high time to offer safety support system for the children going to schools. This paper focuses on implementing children tracking system for every child attending school. However the existing systems are not powerful enough to prevent the crime against children since these systems give information about the children group and not about each child resulting in low assurance about their

child safety to parents and also does not concentrate on sensing the cry of the child and intimating the same to its parents. The proposed system includes a child module and two receiver modules for getting the information about the missed child on periodical basis. The child module includes ARM7 microcontroller (lpc 2378), Global positioning system (GPS), Global system for mobile communication (GSM), Voice playback circuit and the receiver module includes Android mobile device in parent's hand and the other as monitoring database in control room of the school. Finally, implementation results for the proposed system are provided in this paper.

Paper 3:

What the world is seeing about the deterioration of public safety in various cities and the increase in the rate of crimes against children makes parents constantly worry about their children when they go to school and until they return from it. To dispel these fears, the idea emerges to create an application that allows parents to know the whereabouts of their children and notify them with a message if the children exceed the area specified for them. In this application, the process of discovering the child's precise location in a specific area is carried out by determining the latitude and longitude using the GSM radio navigation system. After that, the mobile receives all the information about the location via the GSM modem. A GSM modem has been programmed to achieve communication between the modem and the child by two methods of communication through which the child's location is determined. Ensuring that the child's location is known at any time and informing the person responsible for tracking him is the primary function of this system. This device connects to the child in an appropriate manner and it turns on when the child exits the designated area for him, after which a message is sent to the tracker. The device can be triggered using a short messaging system (SMS) where the user can communicate remotely to the GSM using a mobile.

Paper 4:

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Paper 5:

Nowadays, crime rate associated with children keeps increasing due to which draws peoples' attention regarding child safety. This research is conducted to propose a child security smart band utilizing IOT technology. Online questionnaire and semi-structured interview are methodologies used to collect data. The online questionnaire gains feedbacks by sending questions electronically, where answers need to be submitted online. In the semi structured interview, researcher meets and asks respondents some predetermined questions while other being asked are not planned in advanced. Through information obtained, a smartband have been proposed to monitor the safety of children. By this, parents know what is happening remotely and can take actions if something goes wrong. The future improvements of this device will be adding functions and software to make it works like a phone such as messaging, gallery, Google, YouTube, meanwhile, adding more child security features sothat child safety is guaranteed.

Paper 6:

Now-a-days attacks on children are increasing at an unprecedented rate and the victims are in dangerous conditions, where they are not allowed to contact the family members. The key idea planned in this research work is an advanced technology that offers "Smart Child Safety" for the children. Therefore, the awareness of this method is to send an SMS from children's wear tool to their parent or guardian. In the prevailing structure, there is no monitoring method for child, it should create many problems for them and the no protection mechanism to protect the child from the misbehavior. In addition, there is no aware device for the child's protection; it must be completed by hand only. Thus, the planned method will be highly effective when compared to the other existing techniques in

helping the victims. Moreover, it doesn't need any manual operation. This paper recommends a newfangled technology for child protection by using GSM so that the children will not feel abandoned while facing such social problems. The problems overawed here using Arduino UNO, GSM, sensors, MEMS, temperature and panic button by using IOT. In such case, Heartbeat Sensor tracks the best rate for children and sends the emergency message by using the GSM to save contacts. Such method is actually supportive for children in today's world. Hence, this provides a security to the children and secures the feeling of parents.

Paper 7:

Today, technology is growing rapidly and providing all essential and effective solutions for every requirement. Now a day's child security is an important area of concern. This model is developed to rectify the worries of parents regarding their child security. In this scenario, our system ensures maximum security and ensures live tracking for their kids because parent worries are genuine. This paper proposed a model for child safety through smart phones that provides the option to track the location of their children as well as in case of emergency children is able to send a quick message and its current location via Short Message services. This proposed system is validated by testing on the Android platform.

Paper 8:

Safety of a child in a large public event is a major concern for event organizers and parents. This paper addresses this important concern and proposes an architecture model of the IOT- enable smart child safety tracking digital system. This IOT-enabled digital system architecture integrates the Cloud, Mobile and GPS technology to precisely locate the geographical location of a child on an event map. The proposed architecture model describes the people, information, process, and technology architecture elements, and their relationships for the complex IOT-enable smart child safety tracking digital system. The proposed architecture model can be used as a reference or guide to assist in the safe architecture driven development of the various child tracking digital systems for different public events.

Paper 9:

The objective of this project is to safeguard the child from threads. Now a day the safety measures of children have been reduced in huge number. Thus the violence against children increasing day by day. Not only kids even women are also abused both physically and mentally. We are taking small step towards violence against the kids. Our project mainly focus on sensing the children's Temperature and Heartbeat. By monitoring the activities the state of the child is analyzed. By using GSM, if child reaches the critical state then the latitude and longitude of that particular location is sent as an alert message to the parents. In this system, it has a MEMS sensor which is used to detect the abnormal vibration and it is controlled by NodeMCU micro controller.

Paper 10:

The objective of this project is to safeguard the child from threads. Now a day the safety measures of children have been reduced in huge number. Thus the violence against children increasing day by day. Not only kids even women are also abused both physically and mentally. We are taking small step towards violence against the kids. Our project mainly focus on sensing the children's Temperature and Heartbeat. By monitoring the activities the state of the child is analyzed. By using GSM, if child reaches the critical state then the latitude and longitude of that particular location is sent as an alert message to the parents.

2.2 References:

Paper 1:

Designing and implementing the people tracking system in the crowded environment using mobile application for smart cities. The Society for Reliability Engineering, Quality and Operations Management (SREQOM), India and The Division of Operation and Maintenance, Lulea University of Technology, Sweden 2021

Paper 2:

Proceedings of the 3rd International Conference on Integrated Intelligent Computing.Communication & Security (ICIIC 2021)IoT-based Child Security Monitoring System

Paper 3:

Design and Implementation of a Smart System for School Children Tracking

Paper 4:

Design and Implementation of Children Tracking System using ARM7 on Android Mobile Terminals(September-2014)

Paper 5:

Proceedings of the 3rd International Conference on Integrated Intelligent Computing Communication & Security (ICIIC 2021) -IOT-based Child Security Monitoring System

Paper 6:

Proceedings of the Third International Conference on Intelligent Communication Technologies and Virtual Mobile Networks (ICICV 2021).Design of Wearable Device for Child Safety

Paper 7:

2016 Second International Conference on Computational Intelligence & Communication Technology- Child Safety & Tracking Management System

Paper 8:

2020 IEEE 14th International Conference on Semantic Computing (ICSC) -IOT-enabled Smart Child Safety Digital System Architecture

Paper 9:

Child Safety Wearable Device.(March 2019)

Paper 10:

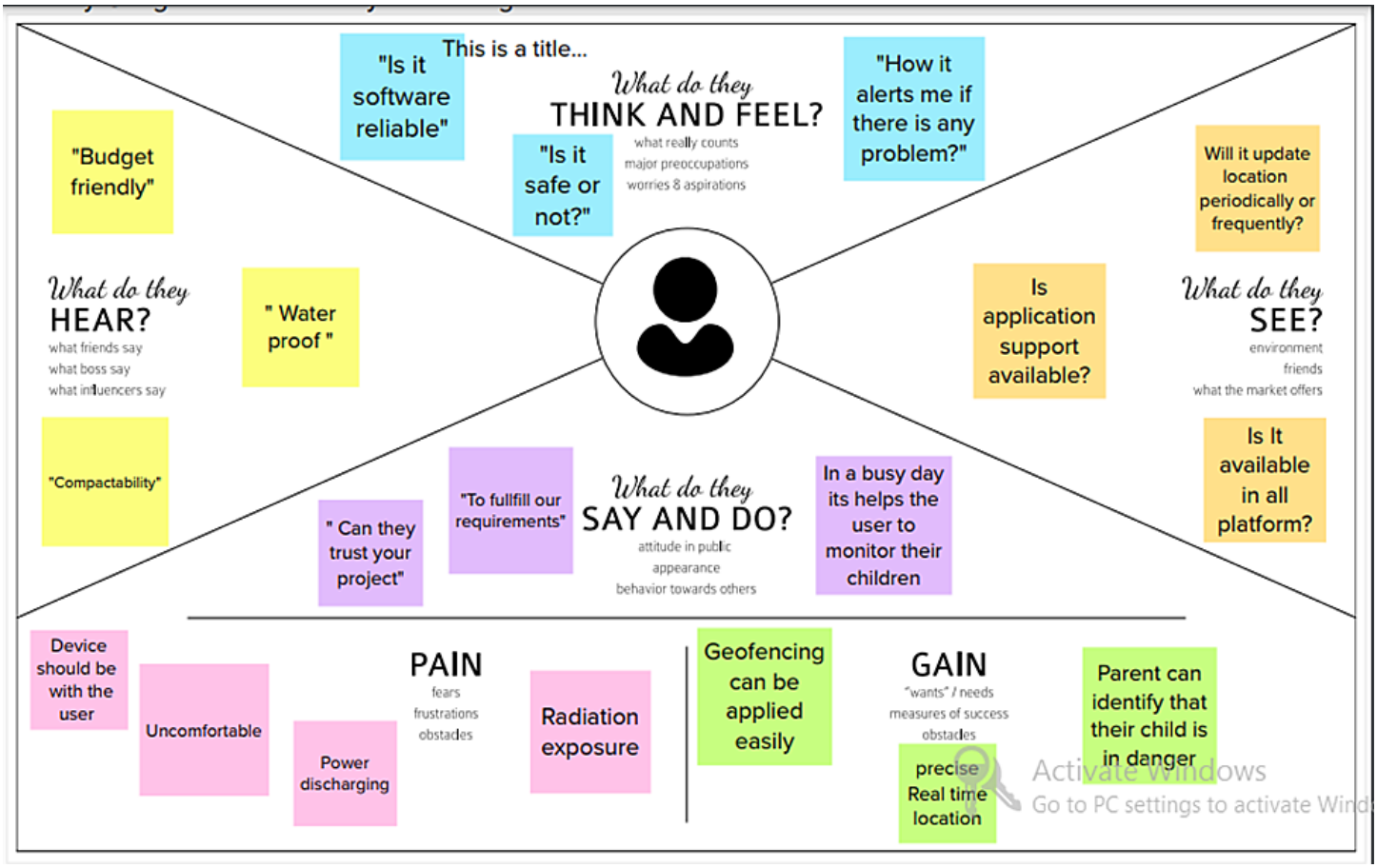
International Conference on Electrical Engineering and Computer science 2018, An Integrated Child Safety using Geo-fencing Information on Mobile Devices

2.3 Problem Statement Definition:

1. Child tracker helps the parents in continuously monitoring the child's location.
2. They can simply leave their children in school or parks and create a geofence around the particular location.
3. By continuously checking the child's location notifications will be generated if the child crosses the geofence.
4. Notifications will be sent according to the child's location to their parents or caretakers.
5. The entire location data will be stored in the database.

3.IDEATION AND PROPOSED SOLUTION:

3.1 Empathy Map Canvas



3.2 Ideation and Brainstorming

3.3 Proposed Solution

S.No.	Parameter	Description
1.	Problem Statement(Problem to be solved)	1. Child tracker helps the parents in continuously monitoring the child's location. 2. They can simply leave their children in school or parks and create a geofence around the particular location. 3. By continuously checking the child's location notifications will be generated if the child crosses the geofence. 4. Notifications will be sent according to the child's location to their parents or caretakers. The entire location data will be stored in the database
2.	Idea/Solution description	1. Without any Interruption of miscellaneous signal for better performance. 2. It should be compact and it is mostly a wearable one.
3.	Novelty/ Uniqueness	1. If the children cross the geofence area , Snapshot of the current location of the child is notify to the parents. 2. Without internet the device should be communicate within a short range.

4.	Social Impact/ Customer Satisfaction	1. Parents do their work properly and peacefully. 2. Without disturbing the parents work ,only the device alert when the child crosses the geofence.
5.	Business Model(Revenue Model)	1. The cost of the device is satisfactory to both Customer and the manufacturer.
6.	Scalability of the Solution	2. To made a separate device for control the gadget. 3. It transmits the messages even in a hill regions.

3.4 Problem Solution Fit

Project Title: Child safety gadget for child monitoring

Project Design Phase-I - Solution Fit Template

Define CS, fit into CC

1. CUSTOMER SEGMENT(S) CS

- Parents of 1-10 year old childrens
- Guardians of the childrens

5. CUSTOMER CONSTRAINTS CC

- Low power consumption,
- Long battery life,
- Budget
- Network connection
- Compact

8 AVAILABLE SOLUTIONS : AS

- When the coustomer loss the child we have to see the location of the child using our gadget and then they find the children.

Explore AS, differentiate

Focus on J&P, tap into BE, understand RC

2. JOBS-TO-BE-DONE / PROBLEMS

- Continuosly monitoring location of the child.
- Send alert notifications to the parents if their children cross the geofense.

6. PROBLEM ROOT CAUSE RC

- The main reason for this problem is losing or missing their child

9. BEHAVIOUR BE

- Continuosly monitoring location of the child using the gadget.
- Send the alert notifications to the parents or guardians if they cross the limit.

Focus on J&P, tap into BE, understand RC

3. TRIGGERS TR

- Lossing of child
- Fear of losing the child

4. EMOTIONS: BEFORE / AFTER

- Parents are lack of confidence,emotionally unsatabble,panic and they fear about the child future while they lost their child.
- They feel happy and relaxed after they find the child.

7. YOUR SOLUTION

- When they lost their child they find their child by using this gadget.
- By Continuously monitoring the child location.

9.CHANNELS of BEHAVIOUR CH

- Online : There should be internet connection for monitoring the child current location.
- Offline :Sending msg to the users when their child cross the geofense area.

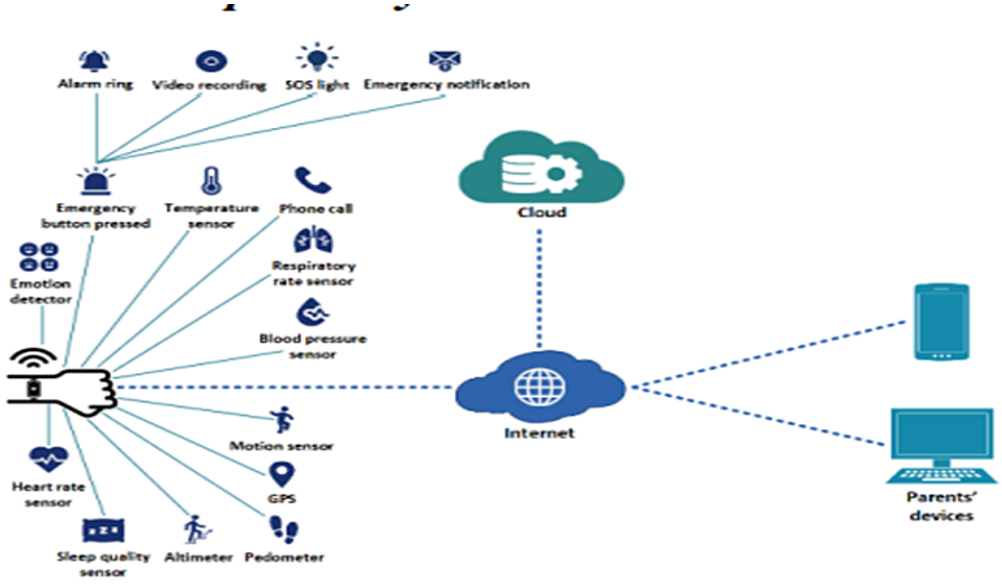
4.REQUIREMENT ANALYSIS:

4.1 Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Communicate and exchange information to provide server for user	1. To monitor the children's location continuously in schools or parks. 2. Alert the parent if the child crosses the geofence through SMS.
FR-2	Continuous monitoring	1. Create the geofence around child location. 2. Continuously monitoring the child location. 3. Notifications send when child cross the geofence and chid face any issues.
FR-3	User requirement	1. Easily upgrade to any environments. 2. Easy to handle. 3. Gives more accuracy. 4. Low power consumption.

FR-4	Mandatory	1. The system will send the detail of location information the system via 3G network or Wi-Fi. 2. Accuracy of location is important. 3. The system should be scalable. 4. The entire location data will be stored
FR-5	Testing Set thegeofence.	1. The device is kept together with the children. 2. Create geofence around the child location in school or parks, if child crosses the geofence notify to the parents 3. Notifications sent in the form of SMS.

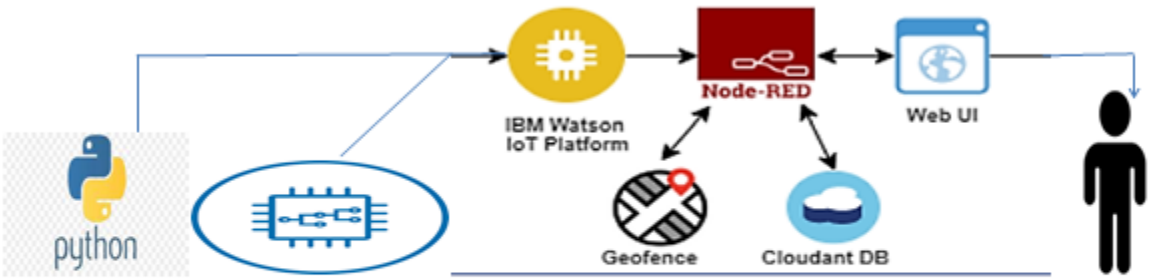


4.2 Non-Functional Requirements :

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	1. High usability of user experience design for user, 2. Which is usable for finding the children if they lost.
NFR-2	**Security**	1. The system can accessed by authorized persons only.
NFR-3	**Reliability**	1. Monitoring the location continuously and easy to upgrade the system .
NFR-4	**Performance**	1. The performance should be more effective and efficient. 2. The location data will be stored.
NFR-5	**Availability**	If we are going to upgrade the system or make any changes in the the system it will not take much time to recovery.
NFR-6	**Scalability**	1. The website traffic limit must be scalable enough to 2. support users at a time.

5. PROJECT DESIGN

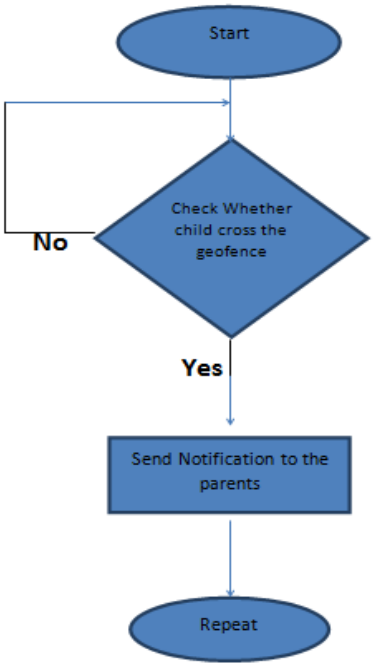
5.1 Data Flow Diagrams:



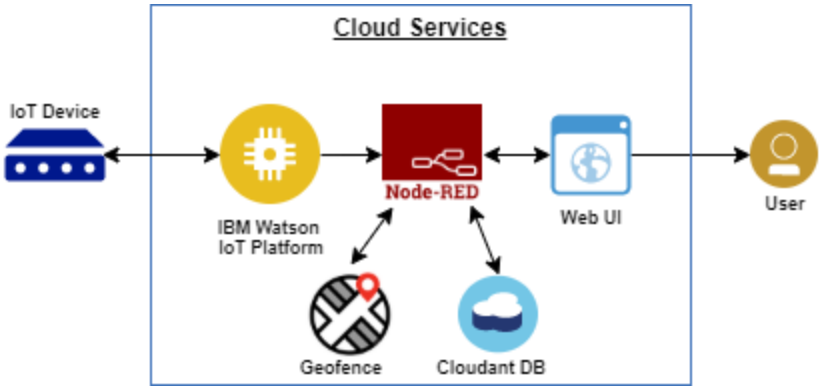
Python Script

IOT device

User



5.2 Technical Architecture:



1. Feed the data from the GPS placed in the Device to the webinterface.
2. The data will display in the web page of the authority(user)
3. The collected data is sent to the data base, wherethe collected location and predefined geophone location are checked and monitored if the child cross the geophone notification sendtothe parents.
4. The location dataisprovidedtothecloudserviceandstored
5. The authority monitors the web page continuouslytocollectthe location dataandsendthealerttothe authority

Components&Technologies

S.No	Components	Description	
1	User Interface	Users had to register and outlook the other device's location Web UI, Mobile App, etc.	HTML, CSS
2	Application Logic-1	Registration of child's and parent's device in each other device.	python
3	Application Logic-2	The child's GPS should be in ON condition, Parent's device should always be correlated to Child's appliance	IBM Watson STT service IBM Watson Assistant
4	Application Logic-3	he child's GPS should be in ON condition, Parent's device should always be correlated to Child's appliance	IBM Watson Assistant IBM Watson STT Service
5	Database	Data Type can be any configuration such as arbitrary binary data, or text. Location history is stored in the cloud and the values include distance, latitude, and longitude. A user-defined blob of data transmitter from Cloud IoT Core to a device	MySQL, NoSQL, SQLite.
6	File Storage	Files will be labelled with what they encompass and how long they should be kept.	IBM Block Storage or Other Storage Service or Local Filesystem
7	Cloud Database	Users install tracking software on a cloud infrastructure to perpetrate the database	IBM DATA BASE
8	External API	The purpose of the external API employed in the device is to exploit the internet for communicating and executing allotted operations efficiently	IBM Weather API, Aadhar API, Geo-Location Lookup
9	Machine Learning Model	IoT and machine learning deliver insights otherwise hidden in data for prompt, automated retorts and enhanced governing.	Object Recognition Model, Danger Prediction Model.
10	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server chassis: Wearable high-tech mechanism. Cloud Server Configuration: a tremendous network that reinforces IoT devices and applications	Local, Cloud Foundry,Underlying Infrastructure.

Application Characersitics:

S.no	Characteristics	Description	Technology
1.	Open source Frameworks	Tracking the location of children	Random data in python script.
2.	Security Implementation	Device ID,IBM cloud and Watson account.	Eg.SHA-256,Encryptions,IAM controls, OWSAP etc.
3.	Scalable Architecture	Upgrade	IBM cloud
4.	Availability	The app contains the Location data of the children.	GPS, Python script
5.	Performance	The system continuously update the location data and if the children cross the geofence it will show alert.	Mobile app,Web UI

5.3 User Stories:

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Parent/Guardian)	Registration	USN-1	As a user, i can login my email	Now i can get the confirmation from login credentials	Low	Sprint-2
		USN-2	As a user, I will connect to the application	With the login id ,I access to the device	High	Sprint-1
		USN-3	As a user my location gets automatically detected and updated from database	Now I can monitor the child's location using the device	Medium	Sprint-2
		USN-4	As a user, if the device crosses the geofencing area	Now I can receive the alert message from the device	High	Sprint-1

6. PROJECT PLANNING AND SCHEDULING:

6.1 Sprint Planning and Estimation:

Product Backlog, Sprint Schedule, and Estimation

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	2	High	Dharshanraj V
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application	1	High	Chinnan S
Sprint-2		USN-3	As a user, I can register for the application through Facebook	2	Low	Keerthiprasath S
Sprint-1		USN-4	As a user, I can register for the application through Gmail	2	Medium	Koushik R P
Sprint-1	Login	USN-5	As a user, I can log into the application by entering email & password	1	High	Dharshanraj V

Project Tracker, Velocity &BurndownChart:

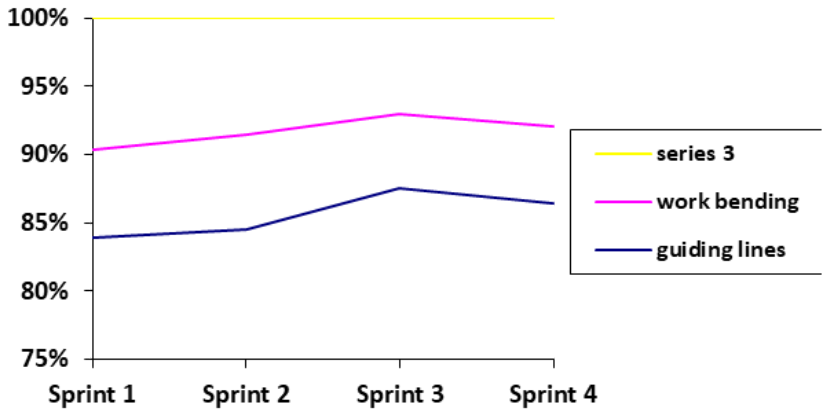
Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	30	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	40	11 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	50	16 Nov 2022

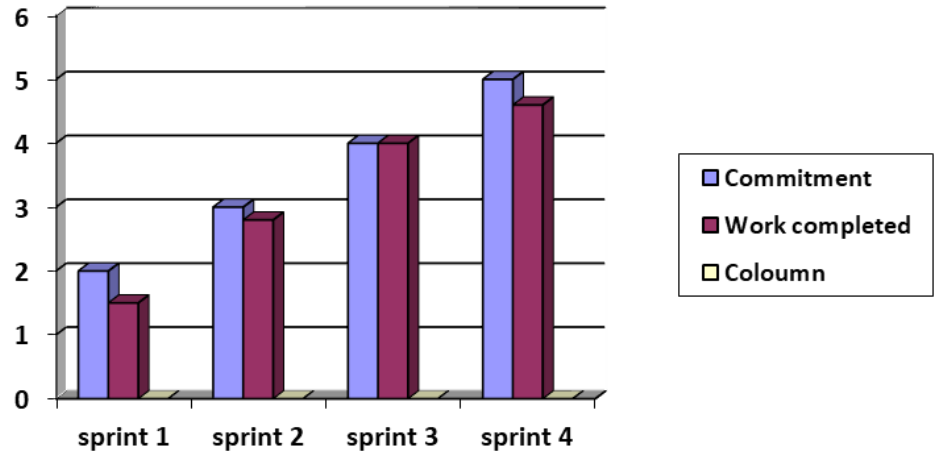
Velocity:

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

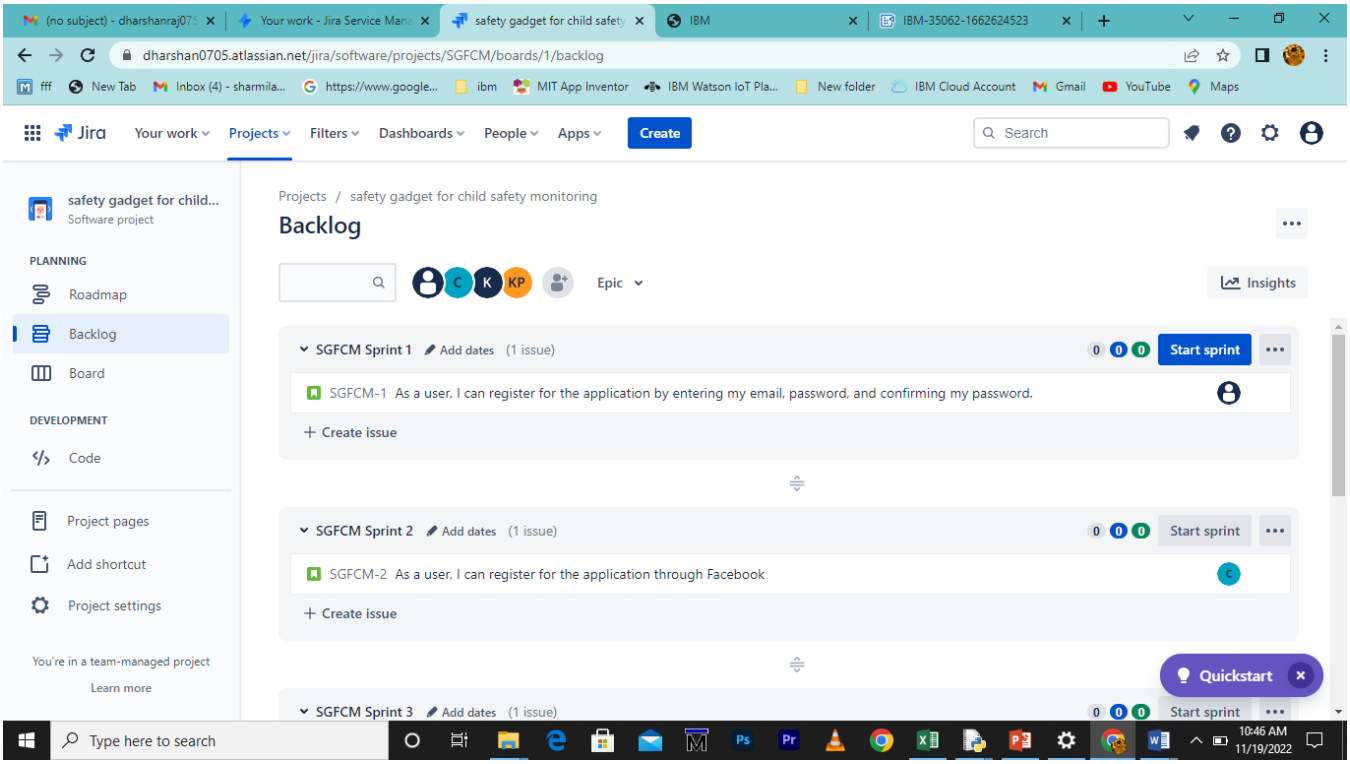
$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

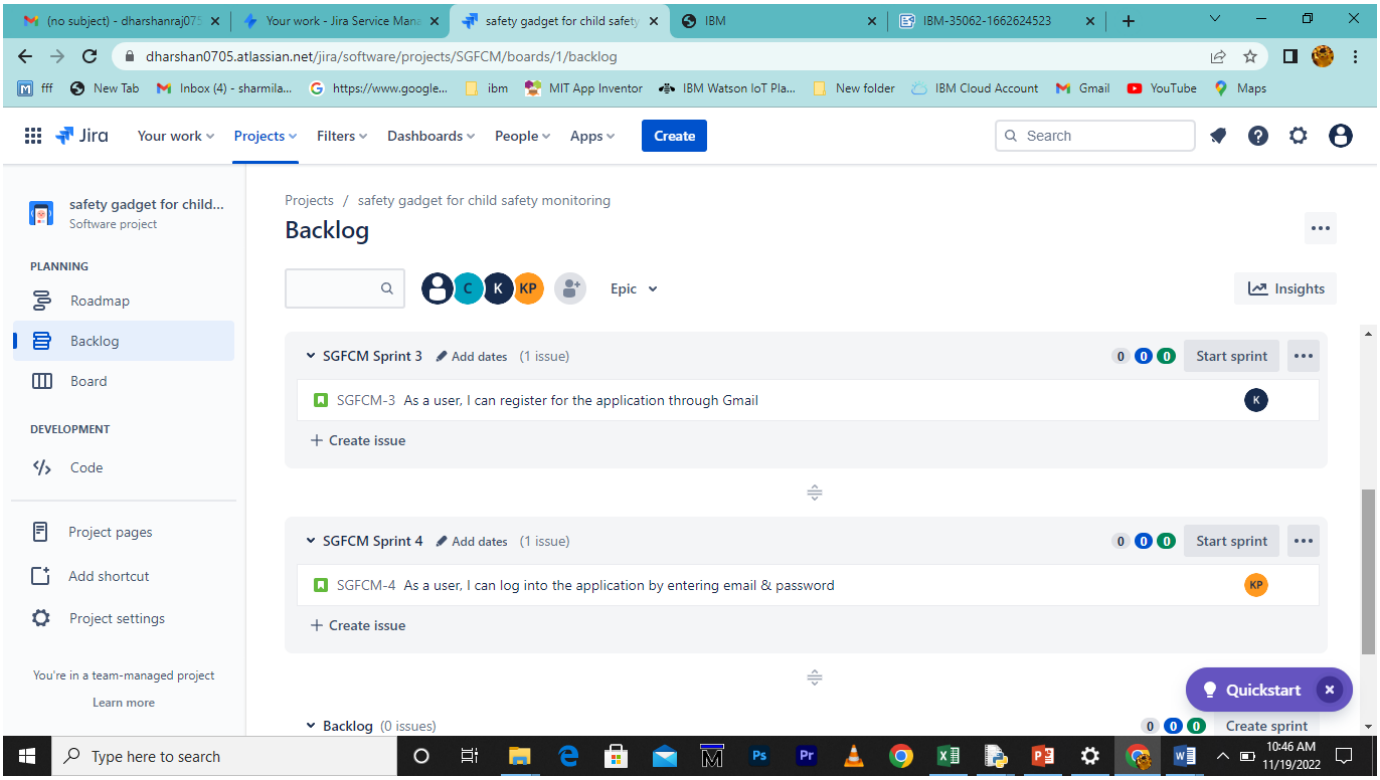
BURNDOWN

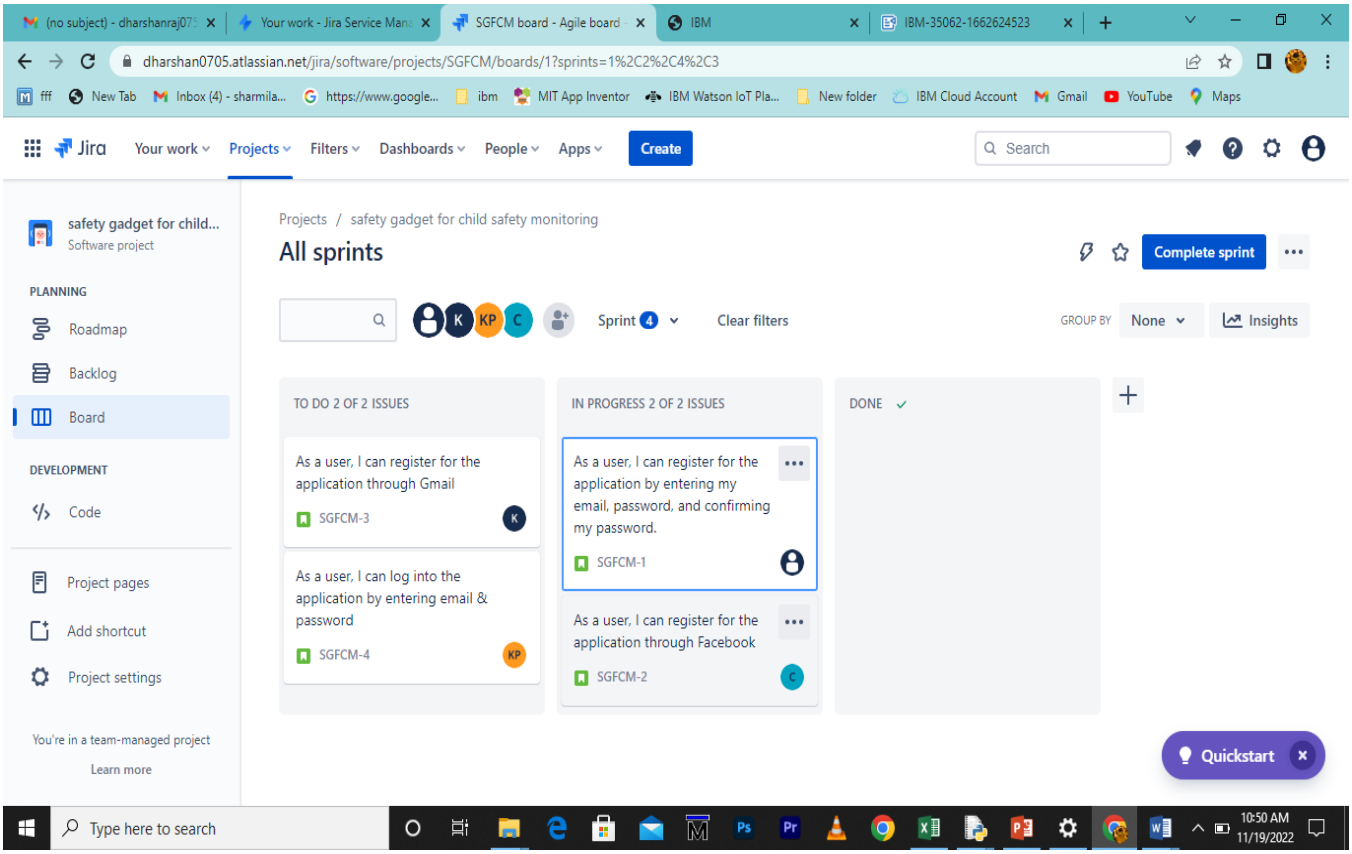




6.3 Report From JIRA



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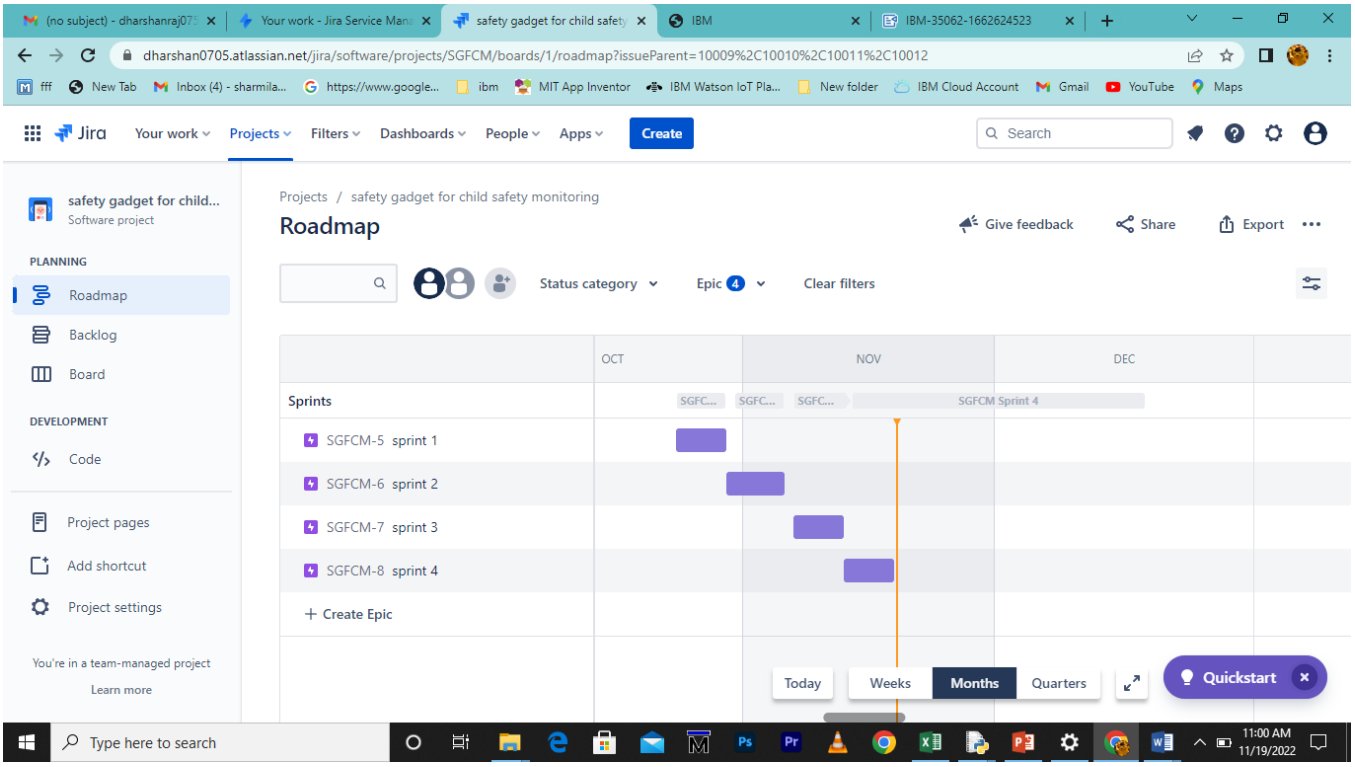
Your work
Projects
Filters
Dashboards
People
Apps
Create
Search
safety gadget for child...
Software project
PLANNING
Roadmap
Backlog
Board
DEVELOPMENT
Code
Project pages
Add shortcut
Project settings
You're in a team-managed project
Learn more
Projects / safety gadget for child safety monitoring
All sprints
Complete sprint
Sprint 4
Clear filters
GROUP BY
None
Insights
TO DO 2 OF 2 ISSUES
As a user, I can register for the application through Gmail
SGFCM-3
As a user, I can log into the application by entering email & password
SGFCM-4
IN PROGRESS 2 OF 2 ISSUES
As a user, I can register for the application by entering my email, password, and confirming my password.
SGFCM-1
As a user, I can register for the application through Facebook
SGFCM-2
DONE
Quickstart
Type here to search
10:50 AM
11/19/2022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Your work
Projects
Filters
Dashboards
People
Apps
Create
Search
safety gadget for child...
Software project
PLANNING
Roadmap
Backlog
Board
DEVELOPMENT
Code
Project pages
Add shortcut
Project settings
You're in a team-managed project
Learn more
Projects / safety gadget for child safety monitoring
Roadmap
Give feedback
Share
Export
Status category
Epic 4
Clear filters
OCT
NOV
DEC
Sprints
SGFCM Sprint 4
SGFCM-5 sprint 1
SGFCM-6 sprint 2
SGFCM-7 sprint 3
SGFCM-8 sprint 4
Create Epic
Today
Weeks
Months
Quarters
Quickstart
Type here to search
11:00 AM
11/19/2022

7.CODING AND SOLUTIONING:

(Explain the features added in the project along with web)

7.1 Feature Code:

```
import time

import sys

importibmiotf.application

importibmiotf.device

import random

#Provide your IBM Watson Device Credentials

organization = "933n2d"

deviceType = "koushik47"

deviceId = "07"

authMethod = "token"

authToken = "87654321"

#apikey  {a-illza1-mbdxqo6z0s}

#api token {zSYzISuAWF&F_x7GkT}

try:

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

        deviceCli = ibmiotf.device.Client(deviceOptions

#.....
```

```
except Exception as e:
        print("Caught exception connecting device: %s" % str(e))
        sys.exit()


# Connect and send a datapoint "hello" with value "world" into the cloud as an event of type "greeting" 10 times
print("power on ")
print("checking connection to wastoniot...")
time.sleep(2)
deviceCli.connect()
print("dear user ... welcome to IBM-IOT ")
print("i can provide your children live location and temperature ")
print()
name=str(input("enter your child name:"))
while True:
temperature=random.randint(20,85)#random temperature for your child
latitude=random.uniform(12.1295314,12.1335137)#random latitude for your child
longitude=random.uniform(78.1955059,78.1986357)#random longitude for your child
       a="Child inside the geofence"
      b=" Child outside the geofence"
       c="High temperature"
```

```
        d="Low temperature"
        x={'your_child_zone':a}
        y={'your_child_zone':b}
        z={'temp_condition':c}
        w={'temp_condition':d}
data = { 'temp' : temperature, 'lat': latitude,'lon':longitude,'name':name  }
        #print data
defmyOnPublishCallback():
print ("Published Temperature = %s C" % temperature, "latitude = %s %%" % latitude, "longitude = %s %%" % longitude, "to IBM Watson")
print("\n")
success = deviceCli.publishEvent("IoTSensorgpsdata", "json", data, qos=0,on_publish=myOnPublishCallback)
if latitude>=12.1303598 and latitude<=12.1321095 and longitude >=78.1967589 and longitude <=78.19820833:
deviceCli.publishEvent("IoTSensorgpsdata","json",data=x,qos=0,on_publish=myOnPublishCallback)
print(x)
print("\n")
else:
deviceCli.publishEvent("IoTSensorgpsdata","json",data=y,qos=0,on_publish=myOnPublishCallback)
print(y)
print("\n")
```

```
if (temperature>=40):
deviceCli.publishEvent("IoTSensorgpsdata","json",data=z,qos=0,on_publish=myOnPublishCallback)
print(z)
print("\n")
else:
deviceCli.publishEvent("IoTSensorgpsdata","json",data=w,qos=0,on_publish=myOnPublishCallback)
print(w)
print("\n")
if not success:
print("Not connected to IoTF")
print("\n")
time.sleep(1)
# Disconnect the device and application from the cloud
deviceCli.disconnect()
```

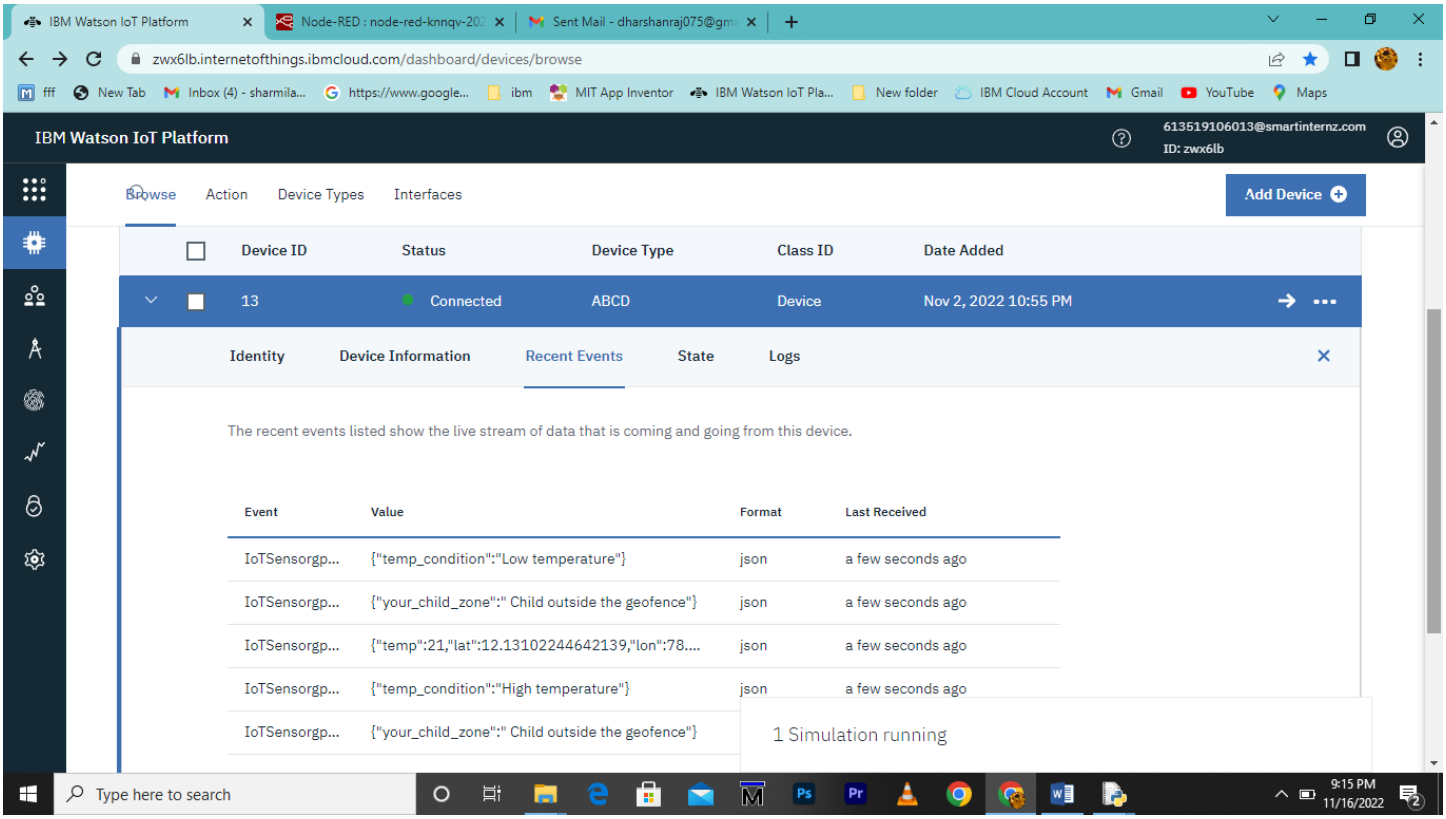
8.TESTING:

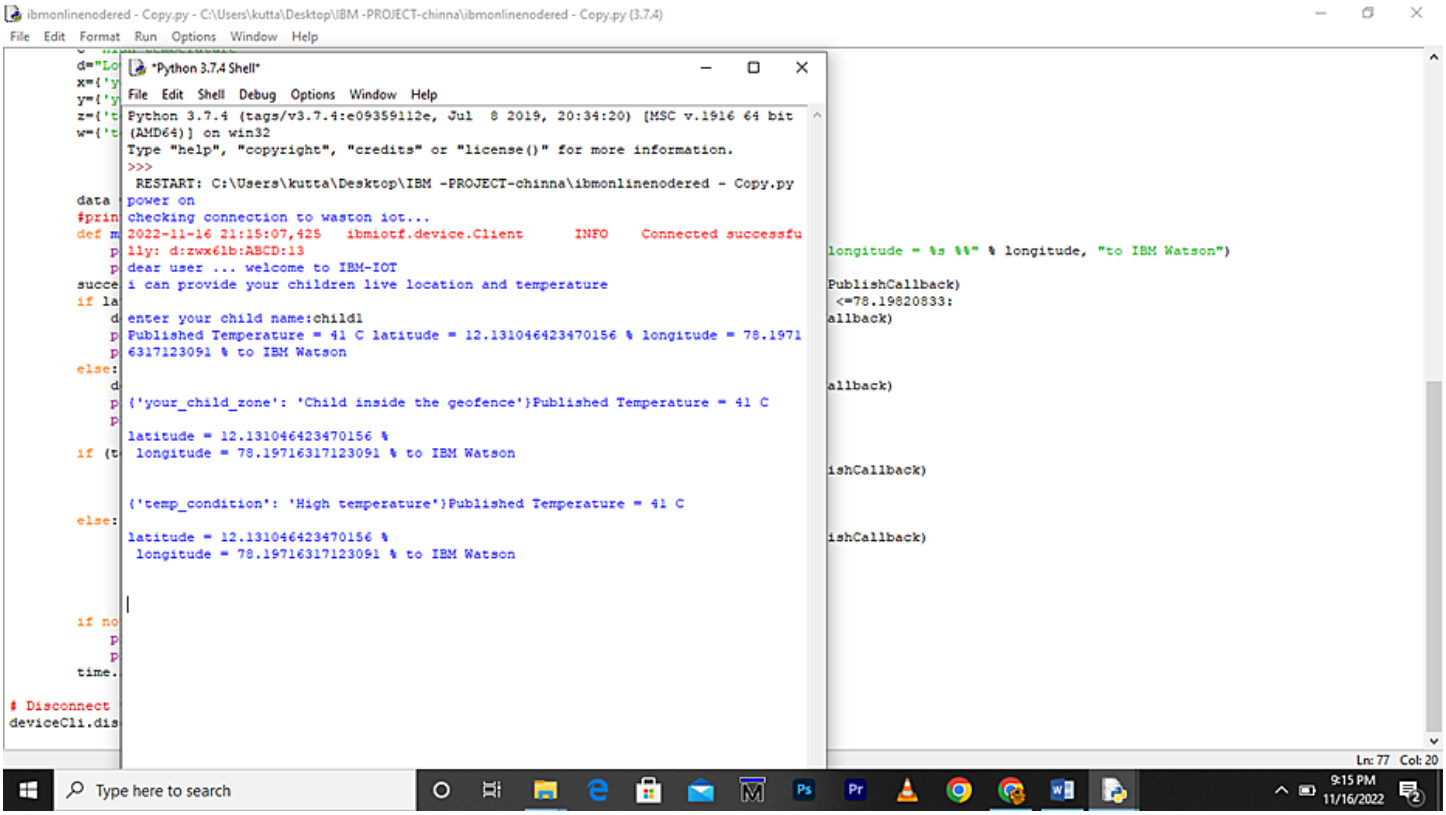
8.1Test case:

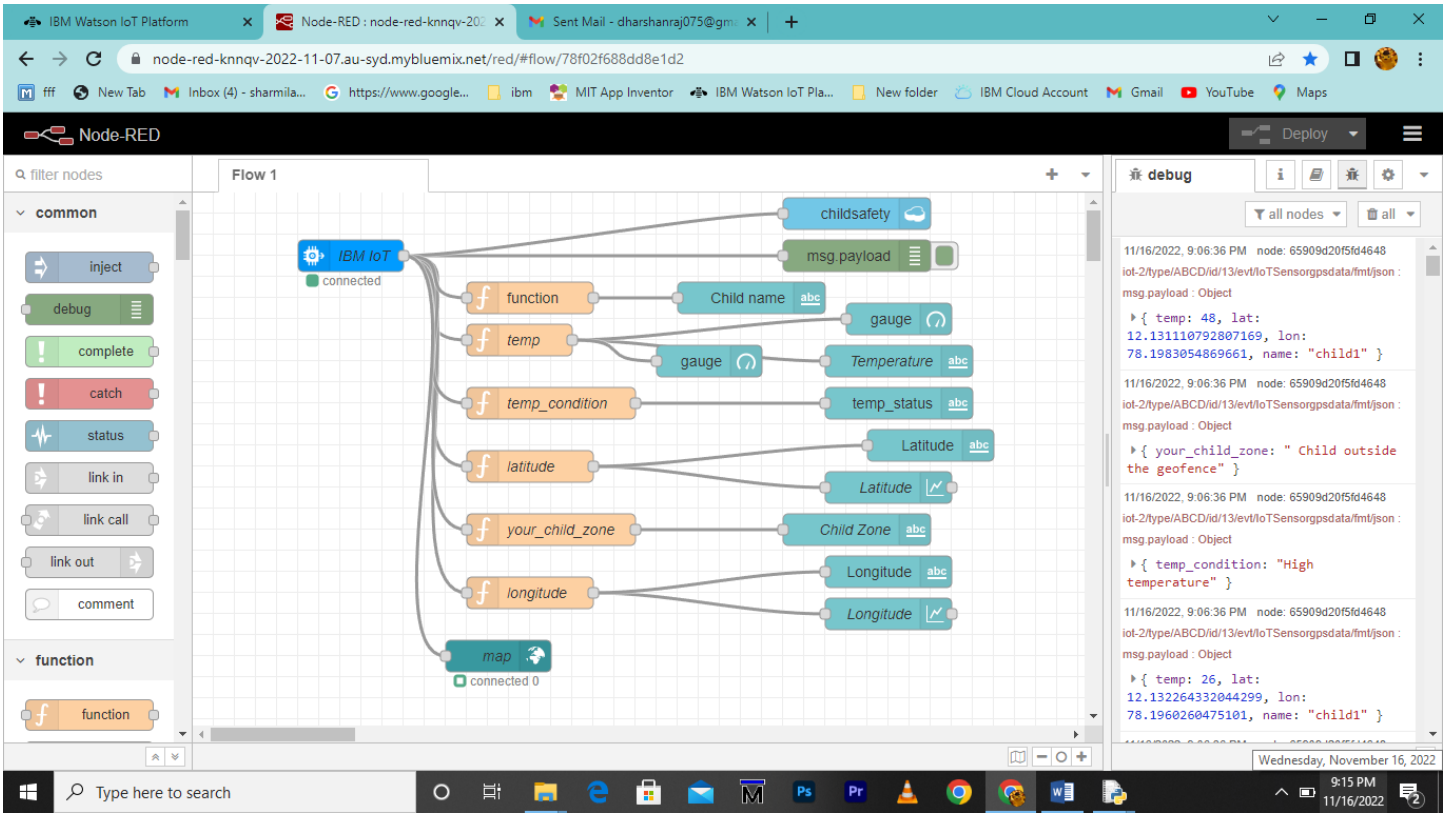
SL.NO	INPUT	OUTPUT	RESULT
01.	Latitude, Longitude Temperature	Inside the geofence, Temperature low	Passed
02.	Latitude, Longitude Temperature	Inside the geofence, Temperature high	Passed
03.	Latitude, Longitude Temperature	Outside the geofence, Temperature low	Passed
04.	Latitude, Longitude Temperature	Outside the geofence, Temperature low	Passed
05.	Latitude, Longitude Temperature	Inside the geofence, Temperature low	Passed
06.	Latitude, Longitude Temperature	Inside the geofence, Temperature high	Passed
07.	Latitude, Longitude Temperature	Outside the geofence,	Passed

		Temperature low	
08.	Latitude, Longitude Temperature	Inside the geofence, Temperature low	Passed
09.	Latitude, Longitude Temperature	Inside the geofence, Temperature high	Passed
10.	Latitude, Longitude Temperature	Inside the geofence, Temperature low	Passed
11.	Latitude, Longitude Temperature	Inside the geofence, Temperature low	Passed
12.	Latitude, Longitude Temperature	Outside the geofence, Temperature low	Passed
13.	Latitude, Longitude Temperature	Inside the geofence, Temperature low	Passed
14.	Latitude, Longitude Temperature	Inside the geofence, Temperature high	Passed
15.	Latitude, Longitude Temperature	Outside the geofence, Temperature high	Passed
16.	Latitude, Longitude Temperature	Outside the geofence, Temperature low	Passed
17.	Latitude, Longitude Temperature	Inside the geofence, Temperature low	Passed

18.	Latitude, Longitude Temperature	Inside the geofence, Temperature high	Passed
19.	Latitude, Longitude Temperature	Outside the geofence, Temperature low	Passed
20.	Latitude, Longitude Temperature	Outside the geofence, Temperature high	Passed
21.	Latitude, Longitude Temperature	Inside the geofence, Temperature low	Passed
22.	Latitude, Longitude Temperature	Inside the geofence, Temperature high	Passed
23.	Latitude, Longitude Temperature	Outside the geofence, Temperature low	Passed
24.	Latitude, Longitude Temperature	Inside the geofence, Temperature low	Passed
25.	Latitude, Longitude Temperature	Outside the geofence, Temperature low	Passed


IBM Watson IoT Platform
zwx6lb.internetofthings.ibmcloud.com/dashboard/devices/browse
IBM Watson IoT Platform
613519106013@smartinternz.com
ID: zwx6lb
Browse
Action
Device Types
Interfaces
Add Device
Device ID
Status
Device Type
Class ID
Date Added
13
Connected
ABCD
Device
Nov 2, 2022 10:55 PM
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
IoTSensorgp...
{"temp_condition":"Low temperature"}
json
a few seconds ago
IoTSensorgp...
{"your_child_zone":" Child outside the geofence"}
json
a few seconds ago
IoTSensorgp...
{"temp":21,"lat":12.13102244642139,"lon":78....
json
a few seconds ago
IoTSensorgp...
{"temp_condition":"High temperature"}
json
a few seconds ago
IoTSensorgp...
{"your_child_zone":" Child outside the geofence"}
1 Simulation running
Type here to search
9:15 PM
11/16/2022


ibmonlinenodered - Copy.py - C:\Users\kutta\Desktop\IBM -PROJECT-chinna\ibmonlinenodered - Copy.py (3.7.4)
File Edit Format Run Options Window Help
Python 3.7.4 Shell
File Edit Shell Debug Options Window Help
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul 8 2019, 20:34:20) [MSC v.1916 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
RESTART: C:\Users\kutta\Desktop\IBM -PROJECT-chinna\ibmonlinenodered - Copy.py
power on
checking connection to waston iot...
2022-11-16 21:15:07,425 ibmiotf.device.Client INFO Connected successfully: d:zwx6lb:ABCD:13
dear user ... welcome to IBM-IOT
i can provide your children live location and temperature
enter your child name:child1
Published Temperature = 41 C latitude = 12.131046423470156 % longitude = 78.19716317123091 % to IBM Watson
{'your_child_zone': 'Child inside the geofence'}Published Temperature = 41 C
latitude = 12.131046423470156 %
longitude = 78.19716317123091 % to IBM Watson
{'temp_condition': 'High temperature'}Published Temperature = 41 C
latitude = 12.131046423470156 %
longitude = 78.19716317123091 % to IBM Watson
Ln: 77 Col: 20
Type here to search
9:15 PM
11/16/2022



8.2 User Acceptance Testing:

Purpose of Document:

The purpose of this document is to briefly explain the test coverage and open issues of the IOT Based Safety Gadget For Child Safety Monitoring and Notification project at the time of the release to User Acceptance Testing (UAT).

Defect Analysis:

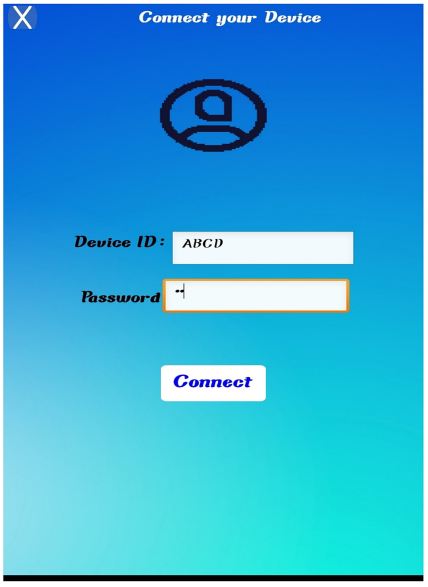
This report shows the number of resolved or closed bugs at each severity level, and how they were resolved

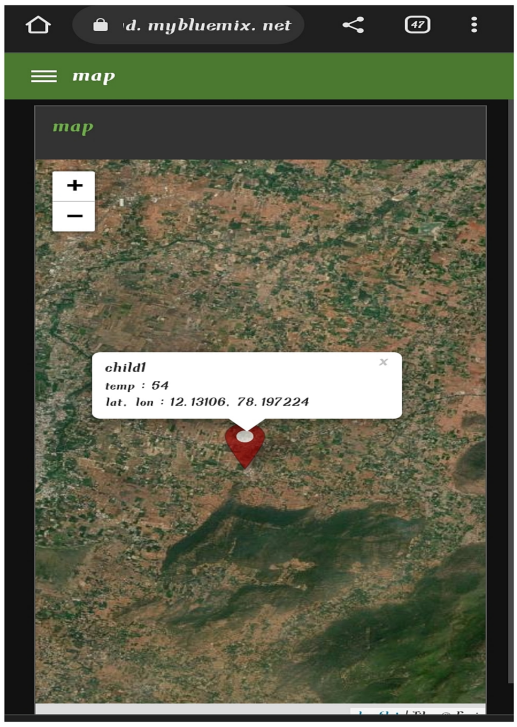
Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	5	3	2	3	13
Duplicate	1	0	0	0	1
External	2	2	0	1	5
Fixed	6	5	3	10	24
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won't Fix	0	0	2	1	3
Totals	14	10	9	16	49

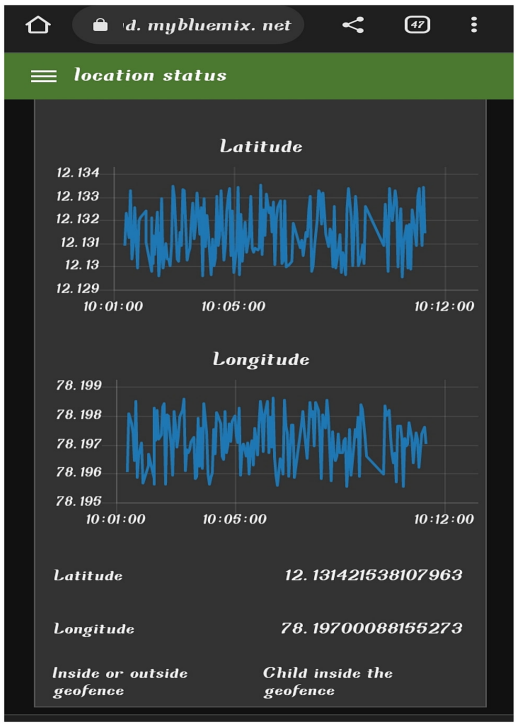
Test Case Analysis

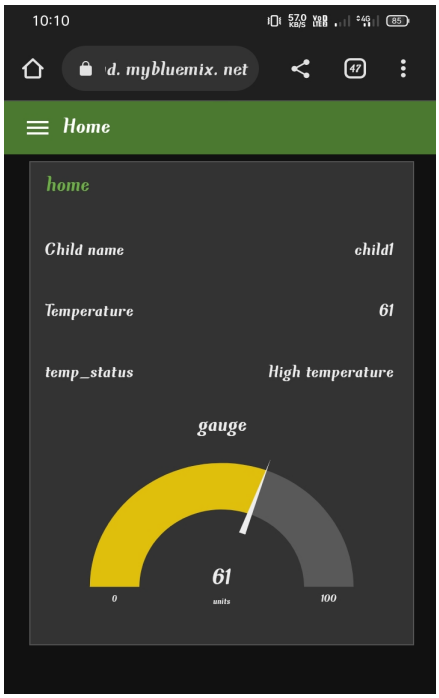
This report shows the number of test cases that have passed, failed, and untested

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	7	0	0	7
Client Application	30	0	0	30
Security	2	0	0	2
Outsource Shipping	3	0	0	3
Exception Reporting	9	0	0	9
Final Report Output	4	0	0	4
Version Control	2	0	0	2




d. mybluemix. net
47
map
map
child1
temp : 54
lat, lon : 12.13106, 78.197224


d. mybluemix. net
47
location status
Latitude
12.134
12.133
12.132
12.131
12.13
12.129
10:01:00
10:05:00
10:12:00
Longitude
78.199
78.198
78.197
78.196
78.195
10:01:00
10:05:00
10:12:00
Latitude
12.131421538107963
Longitude
78.19700088155273
Inside or outside geofence
Child inside the geofence


10:10
d. mybluemix. net
47
Home
home
Child name
child1
Temperature
61
temp_status
High temperature
gauge
61
units
0
100

9.RESULTS:

9.1 Performance metrics

NFT - Risk Assessment

S.No	Project Name	Scope/feature	Functional Changes	Hardware Changes	Software Changes	Impact of Downtime	Load/Volume Changes	Risk Score	Justification
1	Safety Gadget for Child Safety Monitoring and Notification	Existing	Moderate	Low	Moderate	high initial cost	75 to 100%	RED	this system of child safety monitoring and notification is already existing
	difficult in creation of geofence					QP 3			They do not Give live location status
									the risk rate is moderate

NFT - Detailed Test Plan

S.No	Project Overview	NFT Test approach	Assumptions/Dependencies/Risks	Approvals/SignOff
1	Safety Gadget for Child Safety Monitoring and Notification	make a call if the child cross the geofence	Assumptions	

End Of Test Report

S.No	Project Overview	NFT Test approach	NFR - Met	Test Outcome	GO/NO-GO decision	Recommendations	Identified Defects (Detected/Closed/Open)	Approvals/SignOff
	Safety Gadget for Child Safety Monitoring and Notification	Issues occurred while running while connecting with the device while creating geofence		got location of the child got some error while connecting with the device difficult in creation of geofence		to determine the frequently update locations	detected and closed	

10.ADVANTAGES AND DISADVANTAGES

Advantages:

1. Save the life of the children.
2. Parent's do their work peacefully without worrying about their children.
3. Continously monitoring the children.
4. Saves time.
5. Recovery of the children is easy,if the children lost.

Disadvantages:

1. Young Children may refuse to cooperate unless allowed to play with their gadgets.
2. Easily misusing the device.
3. No water proof.

11. CONCLUSION:

The child tracking system that helps parents track the movements of children with the help of GPS technology. The entire location data is stored in database. This proposed app can shows the whether the children inside the geofence or outside the geofence to the parent's mobile . Even if the software is not running, the details are shown. It is because location access is available in the background and the software performs well on the mobile device. Based on the availability of the parent user, additional geofences may be required. Performance Requirements are summarized as follows: login, Location status, temperature ,Live on map etc. The system shall allow the user to create and/or log in to an account. The system shall allow the user to find the exact location of the children using GPS. The system shall allow the user to track the current location of the children using GPS.

12. FUTURE SCOPE:

1. Childs surrounding can be located with the help of accurate and precise real time location.
2. Surrounding environment temperature, SOS light along with Distress buzzers are provided in this system.
3. If child crosses the geofence ,call goes to the registered mobile number’s.
4. This gadgets will be modified that has been suitable for all environments.

13.APPENDIX:

Python code:

```
import time

import sys

importibmiotf.application

importibmiotf.device

import random

#Provide your IBM Watson Device Credentials

organization = "933n2d"

deviceType = "koushik47"

deviceId = "07"

authMethod = "token"

authToken = "87654321"

#apikey  {a-illza1-mbdxqo6z0s}

#api token {zSYzISuAWF&F_x7GkT}

try:

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

        deviceCli = ibmiotf.device.Client(deviceOptions)

        #.....
```

```
except Exception as e:
        print("Caught exception connecting device: %s" % str(e))
        sys.exit()
# Connect and send a datapoint "hello" with value "world" into the cloud as an event of type "greeting" 10 times
print("power on ")
print("checking connection to wastoniot...")
time.sleep(2)
deviceCli.connect()
print("dear user ... welcome to IBM-IOT ")
print("i can provide your children live location and temperature ")
print()
name=str(input("enter your child name:"))
while True:
temperature=random.randint(20,85)#random temperature for your child
latitude=random.uniform(12.1295314,12.1335137)#random latitude for your child
longitude=random.uniform(78.1955059,78.1986357)#random longitude for your child
      a="Child inside the geofence"
      b=" Child outside the geofence"
      c="High temperature"
      d="Low temperature"
```

```
        x={'your_child_zone':a}

        y={'your_child_zone':b}

        z={'temp_condition':c}

        w={'temp_condition':d}

data = { 'temp' : temperature, 'lat': latitude,'lon':longitude,'name':name  }

        #print data

defmyOnPublishCallback():

print ("Published Temperature = %s C" % temperature, "latitude = %s %%" % latitude, "longitude = %s %%" % longitude, "to IBM Watson")

print("\n")

success = deviceCli.publishEvent("IoTSensorgpsdata", "json", data, qos=0, on_publish=myOnPublishCallback)

if latitude>=12.1303598 and latitude<=12.1321095 and longitude >=78.1967589 and longitude <=78.19820833:

deviceCli.publishEvent("IoTSensorgpsdata","json",data=x,qos=0,on_publish=myOnPublishCallback)

print(x)

print("\n")

else:

deviceCli.publishEvent("IoTSensorgpsdata","json",data=y,qos=0,on_publish=myOnPublishCallback)

print(y)

print("\n")

if (temperature>=40):
```

```
deviceCli.publishEvent("IoTSensorgpsdata","json",data=z,qos=0,on_publish=

myOnPublishCallback)

print(z)

print("\n")

else:

deviceCli.publishEvent("IoTSensorgpsdata","json",data=w,qos=0,on_publish=myOnPublishCallback)

print(w)

print("\n")

if not success:

print("Not connected to IoTF")

print("\n")

time.sleep(1)

# Disconnect the device and application from the cloud

deviceCli.disconnect()
```

GitHub &Project demo link:

GitHub Link: https://github.com/IBM-EPBL/IBM-Project-35062-1660281178

MIT app apk file link:

https://drive.google.com/file/d/1aH_4e1wuKVZs8d79vqCFjdxVT8m_t4vZ/view?usp=share_link

Project demonstration video link:

https://drive.google.com/drive/folders/13qU3MMWU7uF3dEhzTdTKQ69yW2vIF3c8