SELVAM COLLEGE OF TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

HX 8001-PROFESSIONAL READINESS FOR INNOVATION, EMPLOYABILITY AND ENTREPRENEURSHIP

SMART SOLUTION FOR RAILWAYS USING IOT

NALAIYA THIRAN PROJECT REPORT 2022

Submitted by

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Team ID: PNT2022TMID41917

NOVEMBER 2022

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1. INTRODUCTION

1.1 PROJECT OVERVIEW

This project is used for booking the railway ticket form the web UI with customize features. By booking the ticket from the web UI user will get a special ID and also creates a QR code which contains all the reference detail about the user such as boarding and destination .The QR code is mainly for the checking purpose and this makes the work easier for the ticket checker for checking the originality of the ticket. After booking the ticket the user will get a unique ID and QR code. From the ticket checkers side they may get a special login from the web UI .The ticket checker uses the QR code reader to scan the QR code. By scanning the QR code the Ticket Checker will receive the booking details of the passenger directly from the cloud IOT.

1.2 PURPOSE

The Internet is essential for computer to connect through network. However, as the world changes, its use is expanding beyond just email and web browsing. The creation of smart homes, smart rural communities, and e-health are all products of today's internet, which also deals with embedded sensors. The idea of IOT was introduced by care's etc. Without human-to-human or human-to-computer interaction, the Internet of Things refers to the connection or communication between two or more devices. The sensors or actuators, connected devices is used to sense their surrounding environment. Sensing the device will gain access to the device, processing the device's data, and offering applications and services make up the four main parts of IOT. Along with this, it also offers data security and privacy. All facets of our daily life have been impacted by automation. In order to save time and reduce human effort, more advancements are being made practically in every industry. The same is being considered while attempting to automate track testing. Railroad track is a crucial component of every company's asset base since it enables them to conduct business as usual. Problems brought on by issues with railroads must be solved. The Indian railroad's most recent technique involves following the train tracks, which takes a lot of time and labour.

2. LITERATURE SURVEY

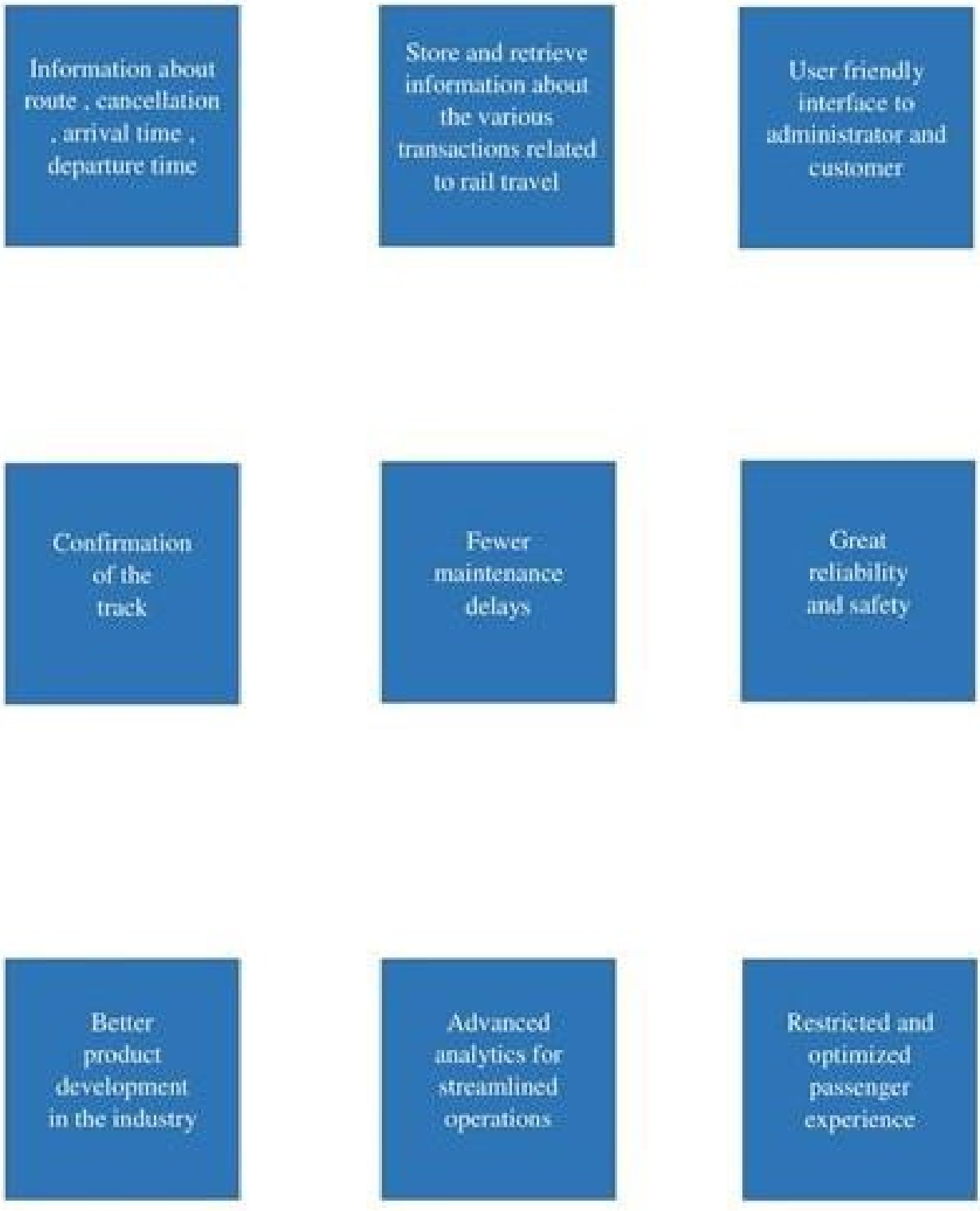
TITLE	AUTHOR & YEAR	JOURNAL NAME	REMARKS
Application of smart computing in Indian railway System	Asokh Nath & 2017	International Journal of Scientific Research and Management Studies (IJSRMS)	The smart model approach for passenger reservation system depends on some pre-requisites, without which the benefits would not be fully enjoyed. This includes the comprehensive UID registration of all passengers who needs to travel.
Smart Railway solutions	Ekaterina KOZYREVA & 2021	Indonesia Journals of Innovative and Research in Science	To examine the theoretical relationship between sense of community, perceived value, consumer satisfaction, and future intentions in low-cost fitness clubs.
5G Key Technologies for Smart Railways	Markus Rupp & 2020	Institute of Electrical and Electronics Engineers (IEEE)	This paper explored a potential solution by leveraging emerging 5G technologies to provide a plethora of services in HSRs, both control and data services. More specifically, we first briefly described the current trend of wireless communications for smart railway.
Internet Of Things for Smart Railways	Arghya Biswas & 2019	Institute of Electrical and Electronics Engineers (IEEE)	The IOT is the key enabling solution to the CBM to enhance the efficiency of the maintenance. In some railway area already start to use the GSM-R technology for communication. But they are also faraway from lOT solution.

A Novel Design of Smart Train	Abishek Gupta & 2018	Institute of Electrical and Electronics Engineers (IEEE)	This includes the comprehensive UID registration of all passengers who needs to travel. IoT data in the aspects of power consumption.
Internet Of Things(IOT) and Indian Railways	Rajnish Kumar & 2016	International Journal of Scientific Research & Management Studies	The role of purchase department can be limited just to give the purchase order, the balance work can be handled by intelligent systems. When the network has information on consignments, stock position etc.

2.2 REFERENCES

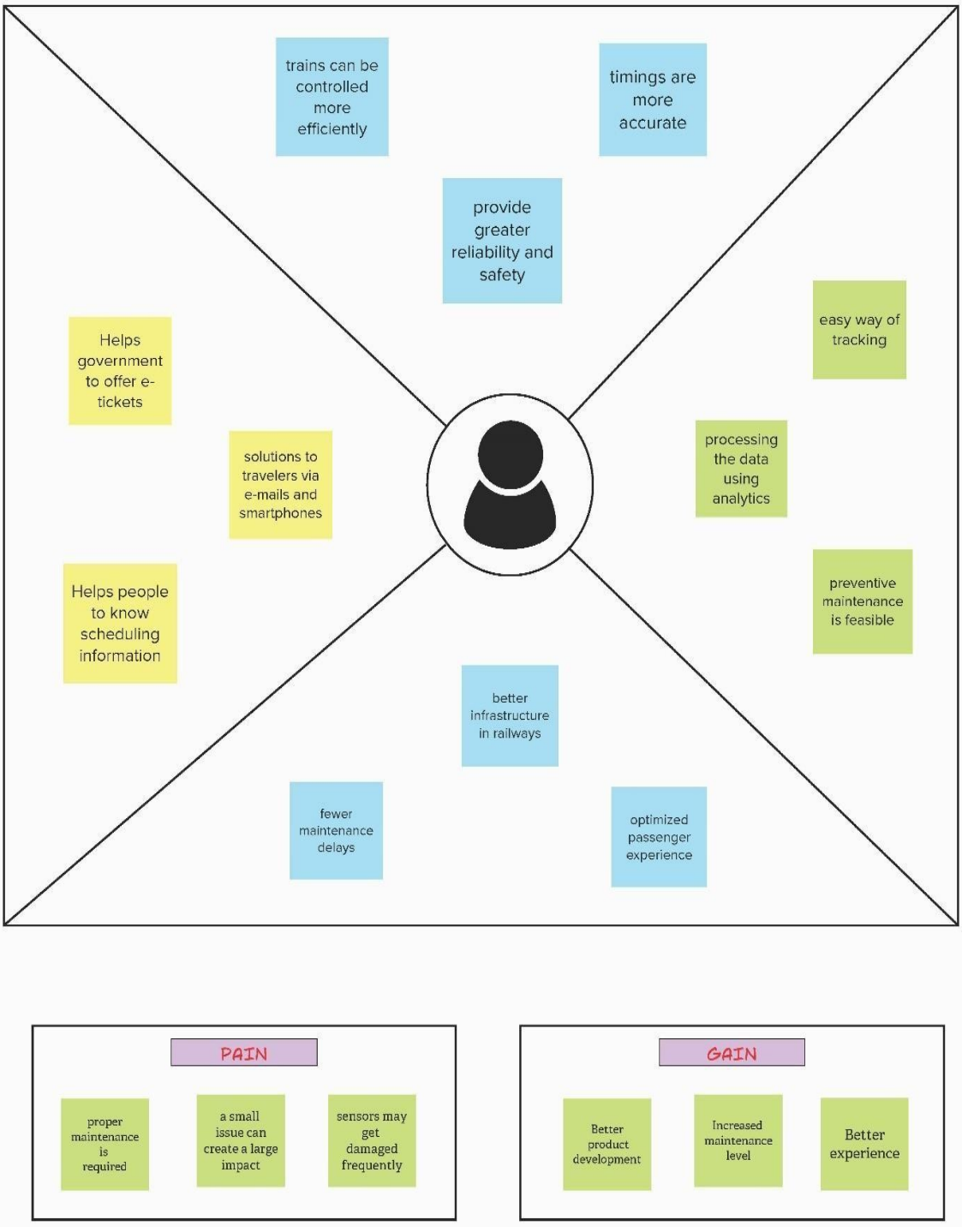
1. 1. Shaofu Lin. “Research and Analysis on the Top Design of Smart Railway” International Journals of Electrical and Computer Engineering(IJECE),2017.
2. Dr. A. Benjamin Joseph. “Smart railway automation system using IOT.” International journal of current engineering and scientific research (IJCESR),2018.
3. Yong-Kyu Kim . “Internet of Things for Smart Railway: Feasibility and Applications.” Institute of Electrical and Electronics Engineers(IEEE),2018.
4. Asokh Nath. “Application of smart computing in Indian railway system.” International Journal of Scientific Research and Management Studies(IJSRMS),2017.
5. Rajnish Kumar. “Internet of Things(IOT) and Indian Railway.” International Journals of Scientific Research and Management Studies,2016.
6. Ekaterina KOZYREVA. “Smart Railway Solutions.” Indonesia Journals of Innovative and Research in Science,2021.
7. Markus Rupp. “5G key technologies for Smart Railways.” Institute of Electrical and Electronics Engineers(IEEE),2020.
8. Arghya Biswas. “ Internet Of Things for Smart Railways.” Institute of Electrical and Electronics Engineers(IEEE),2019.
9. Abishek Gupta. “A Novel design of Smart Train.” Institute of Electrical and Electronics Engineers(IEEE),2018.
10. Marilia Curado “Smart Railway Maintenance – Challenges and Research Directions.” International Journals of Electrical and Computer Engineering(IJECE),2020.

2.3 PROBLEM STATEMENT

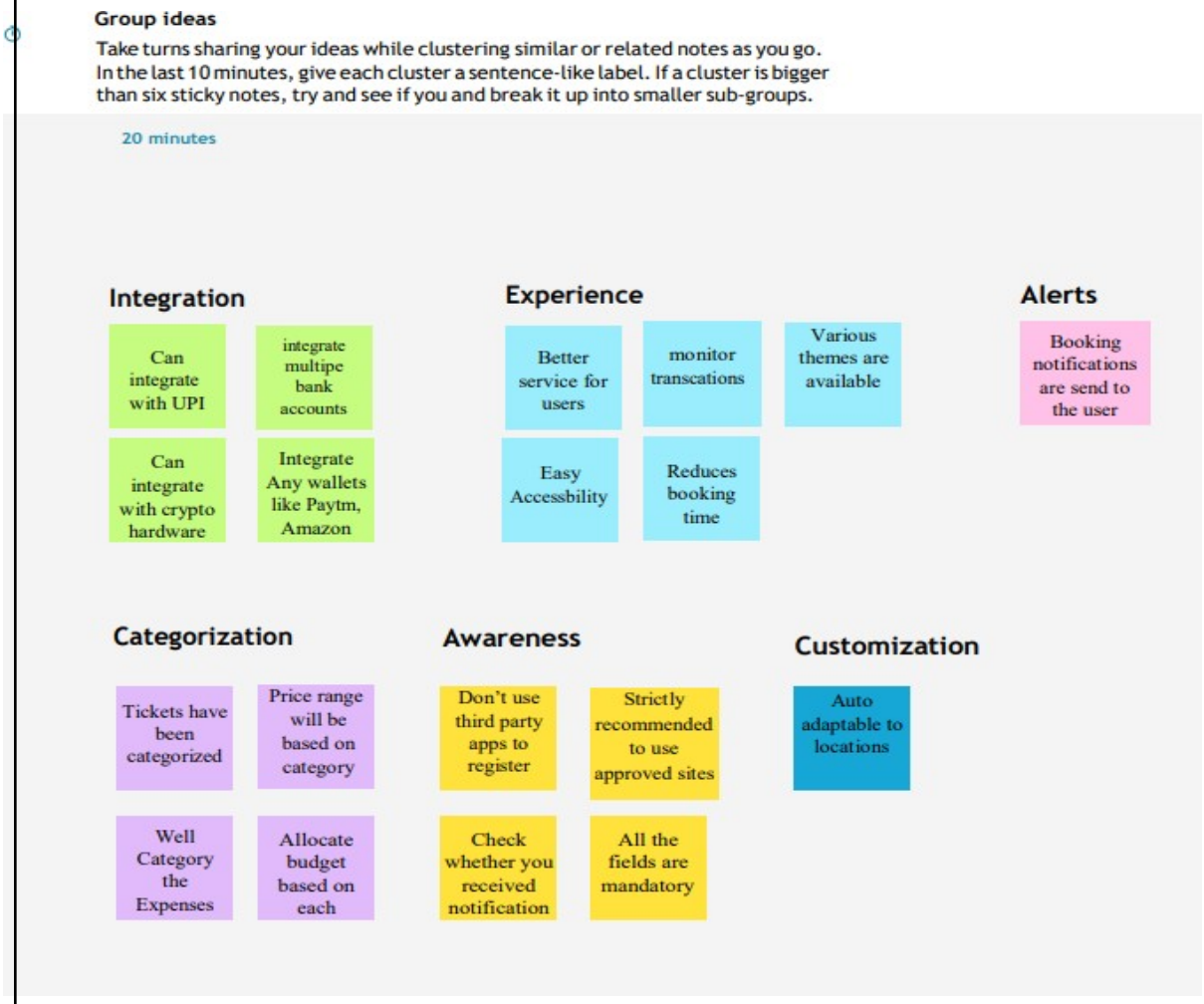


3.IDEATION AND PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS



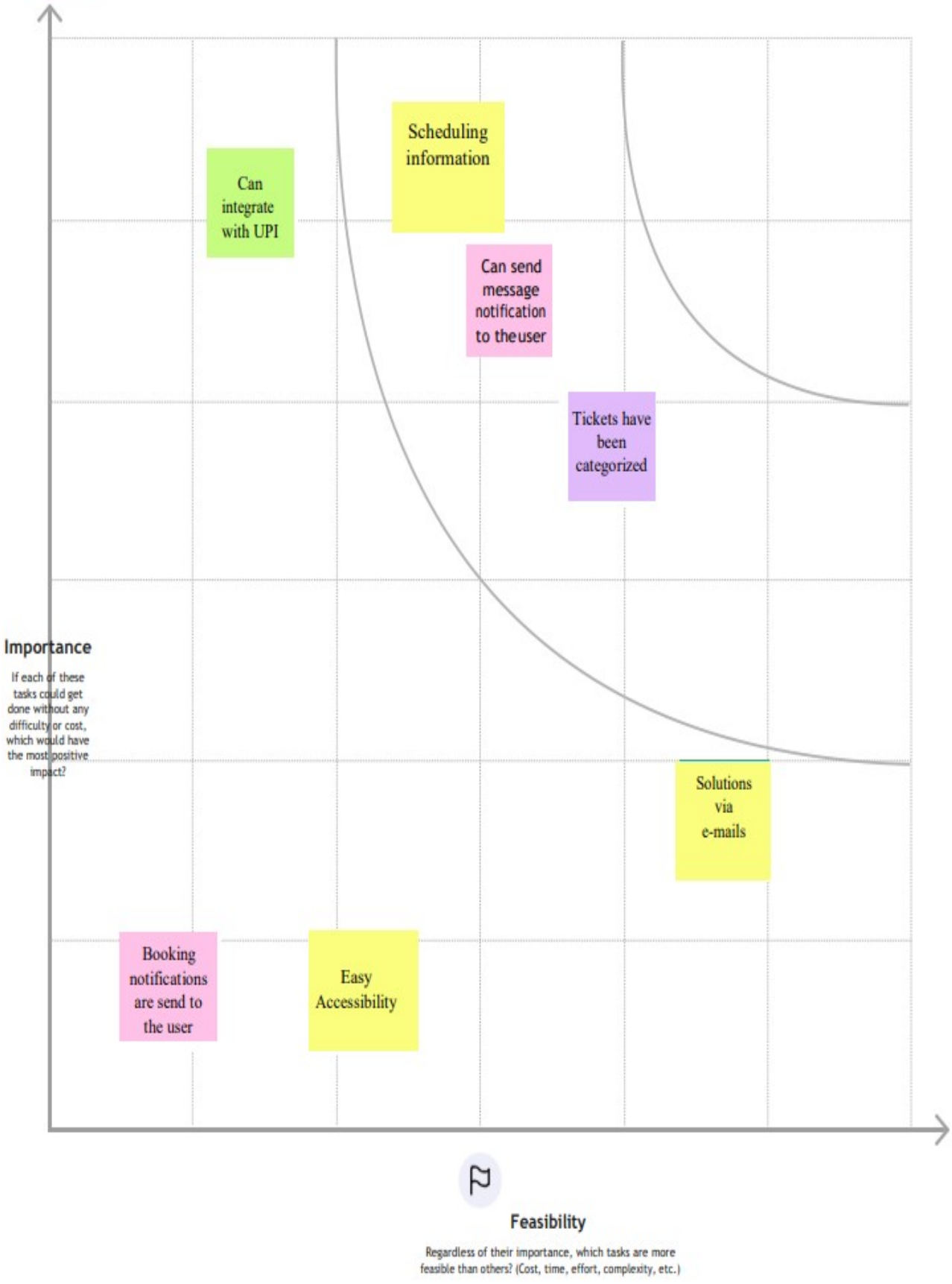
3.2 IDEATION AND BRAINSTORMING



Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

20 minutes



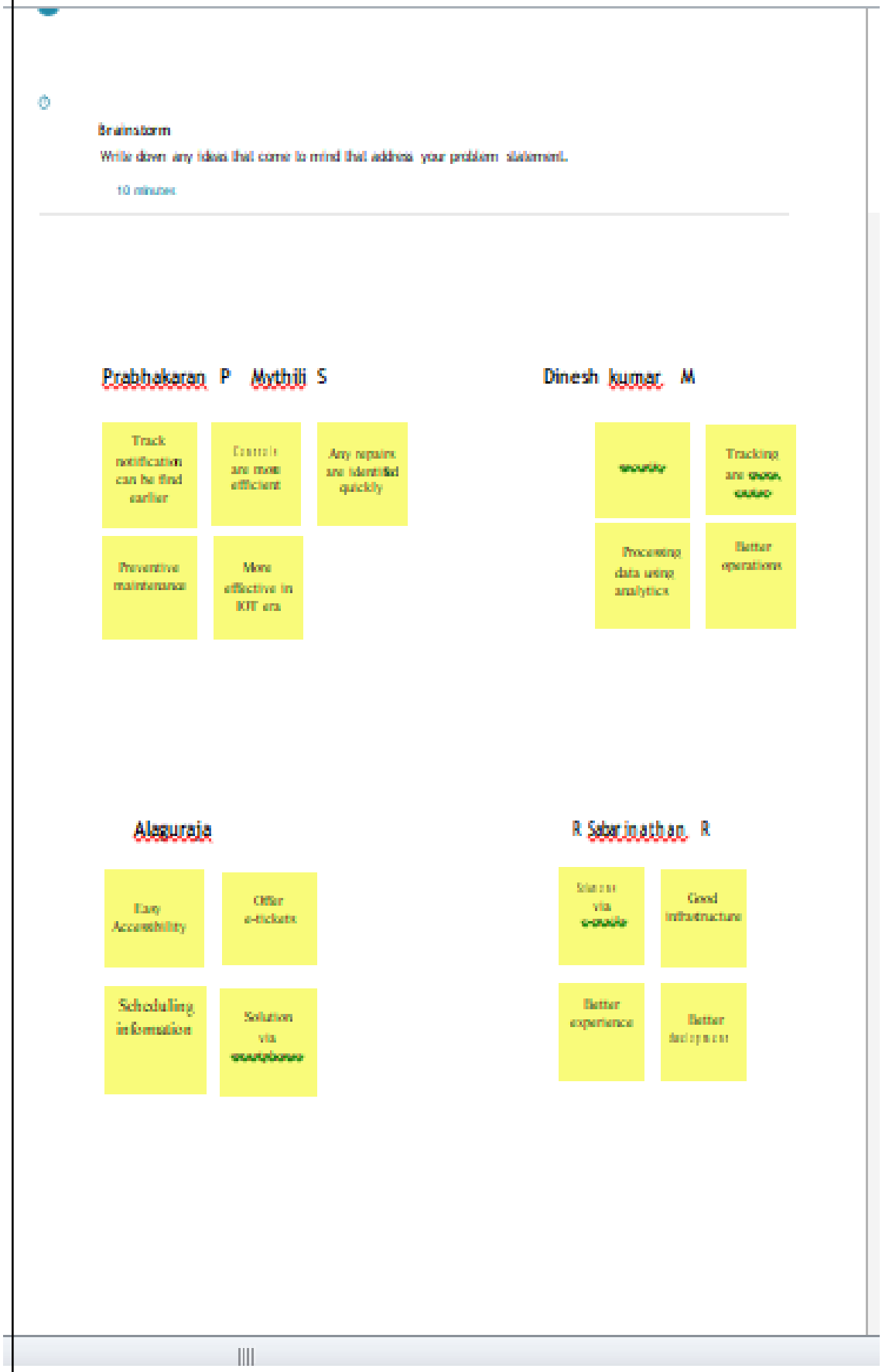
Importance

If each of these tasks could get done without any difficulty or cost, which would have the most positive impact?

Feasibility

Regardless of their importance, which tasks are more feasible than others? (Cost, time, effort, complexity, etc.)

3.3 PROPOSED SOLUTION



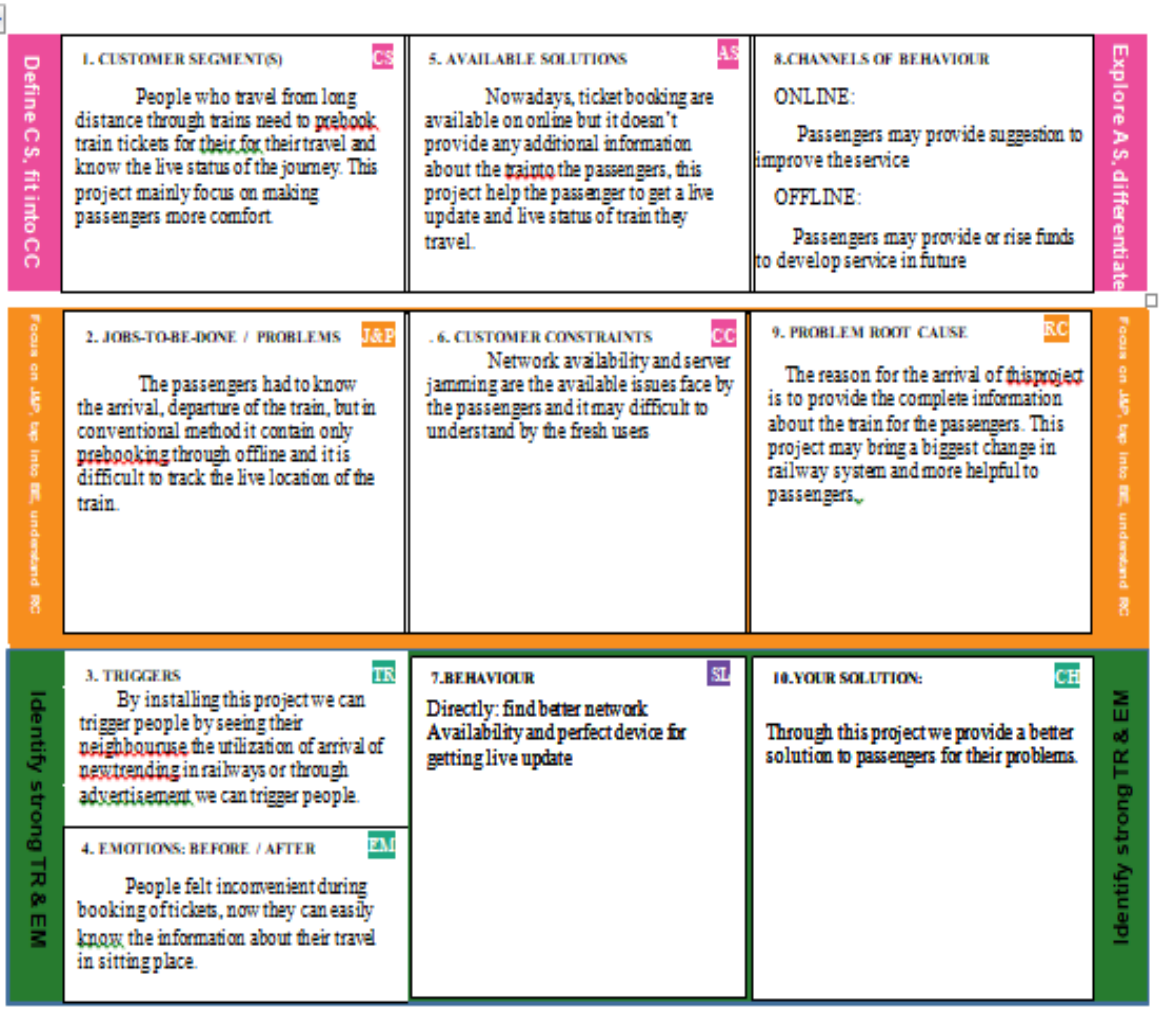
Proposed Solution Template:

Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Smart solution for Railways will provide will provide information about tracks, e-tickets and also the arriving time of the train
2.	Idea / Solution description	We are using various sensors and internet connection to send and receive the notifications and alerts immediately to the railway department and people.
3.	Novelty / Uniqueness	The uniqueness of this project is we can easily identify the track information within short period of time with less manpower.
4.	Social Impact / Customer Satisfaction	It will helps people to book their tickets more easier and more quicker and save their time of booking.
5.	Business Model (Revenue Model)	This project requires less manpower and and have a great life and more accuracy in the system.
6.	Scalability of the Solution	This project can withstand for huge years and technology updation can also applicable to it.

3.3 PROBLEM SOLUTION FIT

Project Title: Smart Solution for Railways | Project Design Phase-I - Solution Fit Template | Team ID: PNT2022TMID41917



4. REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENTS

Functional Requirements:

Following are the functional requirements of the proposed solution.

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 Confirmation via OTP
FR-3		
FR-4		

4.2 NON – FUNCTIONAL REQUIREMENTS

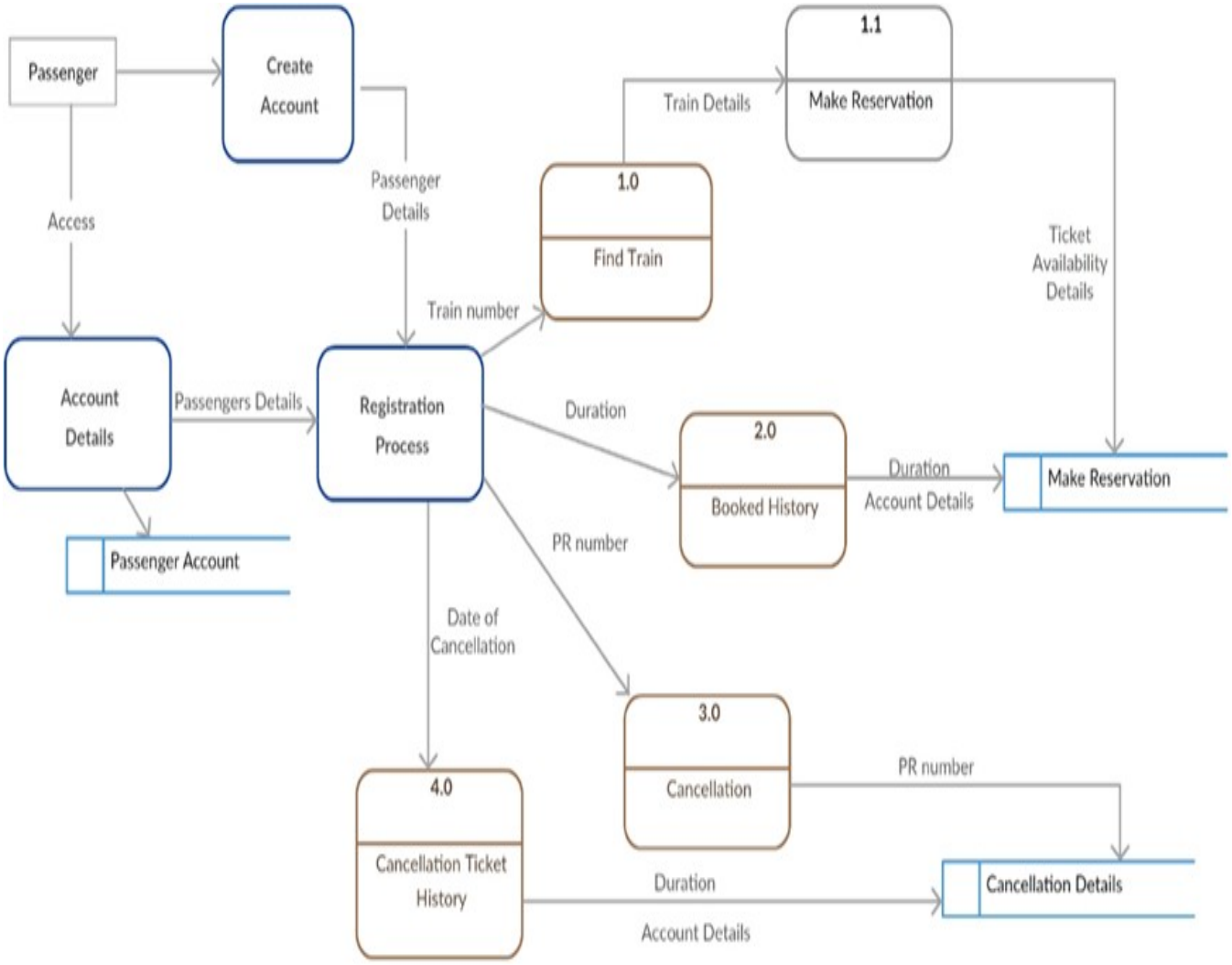
Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

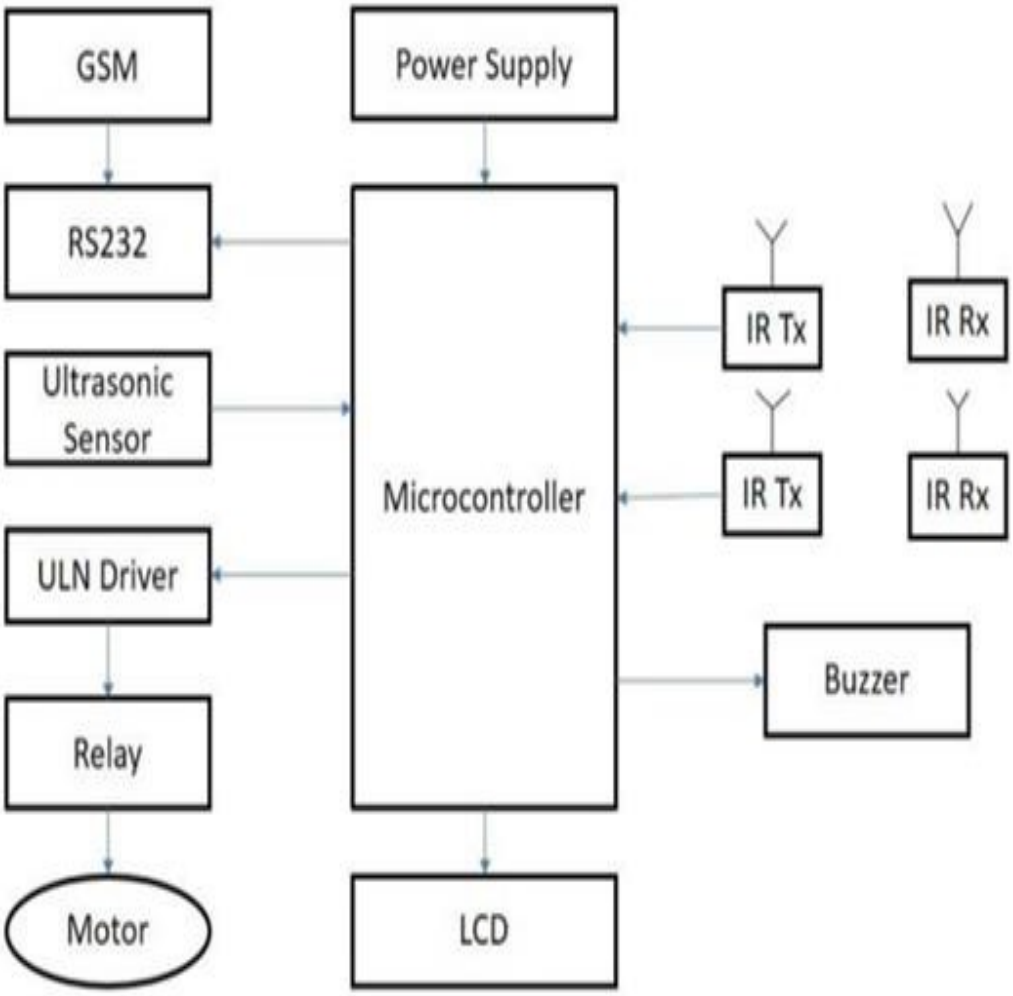
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	We need to register our tickets through online and if it confirmed it will be notified through mail.
NFR-2	**Security**	The customer details will be kept safe and it will not be shared like any other database.
NFR-3	**Reliability**	It's like a public oriented project and all the details of a common people have been stored in it. So high security and higher performance is mandatory. Hence reliability will also be more.
NFR-4	**Performance**	It can have a better performance and can withstand with large number of users without having any lagging issue.
NFR-5	**Availability**	Since it is a government oriented project and it will be available for all the time 24/7 and people can book at anytime and anywhere.
NFR-6	**Scalability**	This project can withstand for huge years and technology updation can also applicable to it.

5. PROJECT DESIGN

5.1DATA FLOW DIAGRAM



5.2SOLUTION AND TECHNICAL ARCHITECTURE



6.PROJECT PLANNING AND SCHEDULING

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	IBM Watson IOT platform,	USN-1	Getting into IBM Watson and create a device with device ID, device type with separate organization ID, authentication token in it.	1	High	P Prabhakaran
	Cloudant DB	USN-2	Getting into Cloudant DB to store our data in it and can be retrieved when the database is called. It will show the information about the tickets booked.	1	Medium	P Prabhakaran
Sprint-2	Node RED	USN-3	Getting into node red and creating a design flow how the process will be working and connecting it with world map and ibm Watson and cloudant DB.	1	High	S Mythili
Sprint-3	Tracking	USN-4	Creating a python code to locate the train by using its latitude and longitude and connect it with IBM Watson by organization ID, device ID, device type, token	1	High	M Dinesh Kumar
	QR-code	USN-5	Creating a python code to generate a qr-code generator and reader. Data entered will be stored in DB and while scanning the code ticket details will be published.	1	High	R Sabarinathan
Sprint-4	MIT app inventor	USN-6	In MIT app design layout will be created and project will be deployed in it.	1	Medium	R Alagu raja
	Testing	USN -7	Every sprint will be merged with each other and testing with the required inputs.	1	High	R Alagu raja

6.2SPRINT DELIVERY SCHEDULE

Project Tracker, Velocity & Burndown Chart: (4 Marks)

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	2	6 Days	24 Oct 2022	29 Oct 2022		
Sprint-2	1	6 Days	31 Oct 2022	05 Nov 2022		
Sprint-3	2	6 Days	07 Nov 2022	12 Nov 2022		
Sprint-4	2	6 Days	14 Nov 2022	19 Nov 2022		

7.CODING AND SOLUTIONING

7.1 FEATURE 1

- IoT Device
- IBM Watson platform
- Node Red
- Cloudant DB
- Web UI
- Geofence
- MIT App
- Python Code

7.2 FEATURE 2

- Registration
- Seats
- Name
- Age
- Mobile Number
- Boarding Station
- Destination Station

IBM CODE:

```
import wiotp.sdk.device
import time
import random
myConfig = {
  "identity": {

     "orgId": "w8dpyu",
     "typeId": "device",
     "deviceId": "123456"
     },
     "auth": {
        "token": "1234567890"
     }
}


 def myCommandCallback(cmd):
  print("Message received from IBM IoT Platform: %s" % cmd.data['command'])
  m=cmd.data['command']

client = wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)
 client.connect()

def pub(data):
  client.publishEvent(eventId="status", msgFormat="json",data=myData,qos=0,onPublish=None)
  print("Published data Successfully: %s", myData)
```

```
while True:
 myData={'name':'Train1','lat':10.8160024,'lon':78.6066253}
 pub(myData)
 time.sleep(2)
 #myData={'name':'Train2','lat':17.6387448,'lon':78.4754336}
 #pub(mydata)
 #time.sleep(3)
 myData={'name':'Train1','lat':17.6341908,'lon':78.4744722}
 pub(myData)
 time.sleep(2)
 myData={'name':'Train1','lat':17.6340889,'lon':78.4745052}
 pub(myData)
 time.sleep(2)
 myData={'name':'Train1','lat':17.6248626,'lon':78.4720259}
 pub(myData)
 time.sleep(2)
 myData={'name':'Train1','lat':17.6188577,'lon':78.4698726}
 pub(myData)
 time.sleep(2)
 myData={'name':'Train1','lat':17.6132382,'lon':78.4707318}
 pub(myData)
 time.sleep(2)
 client.commandCallback = myCommandCallback
client.disconnect()
#dc0(g18y?U0aAG66wS
```

QR CODE:

```
 import cv2
import numpy as np
 import time
  import pyzbar.pyzbar as puzbar
 from ibmcloudant.cloudant_v1 import cloudant_v1
 from ibmcloudant import couchDbsessionAuthenticator
 from ibm_cloud_sdk_core.Authenticators import BasicAuhtenticator

 authenticator=BasicAuthenticator('apikey-v2-
16u3crmdpkghhxefdikvpssoh5fwezrmuup5fv5g3ubz','b0ab119f45d3e6255eabb978')
 service =cloudantv1(authenticator=authenticator)
    service.set_service_url('https://apikey-v2-
16u3crmdpkghhxefdikvpssoh5fwezrmuup5fv5g3ubz:b0ab119f45d3e6255eabb978')

 cap = cv2.videoCapture(0)
 font = cv2.FONT_HERSHEY_PLAIN

 while True:
  _, frame = cap.read(0)
```

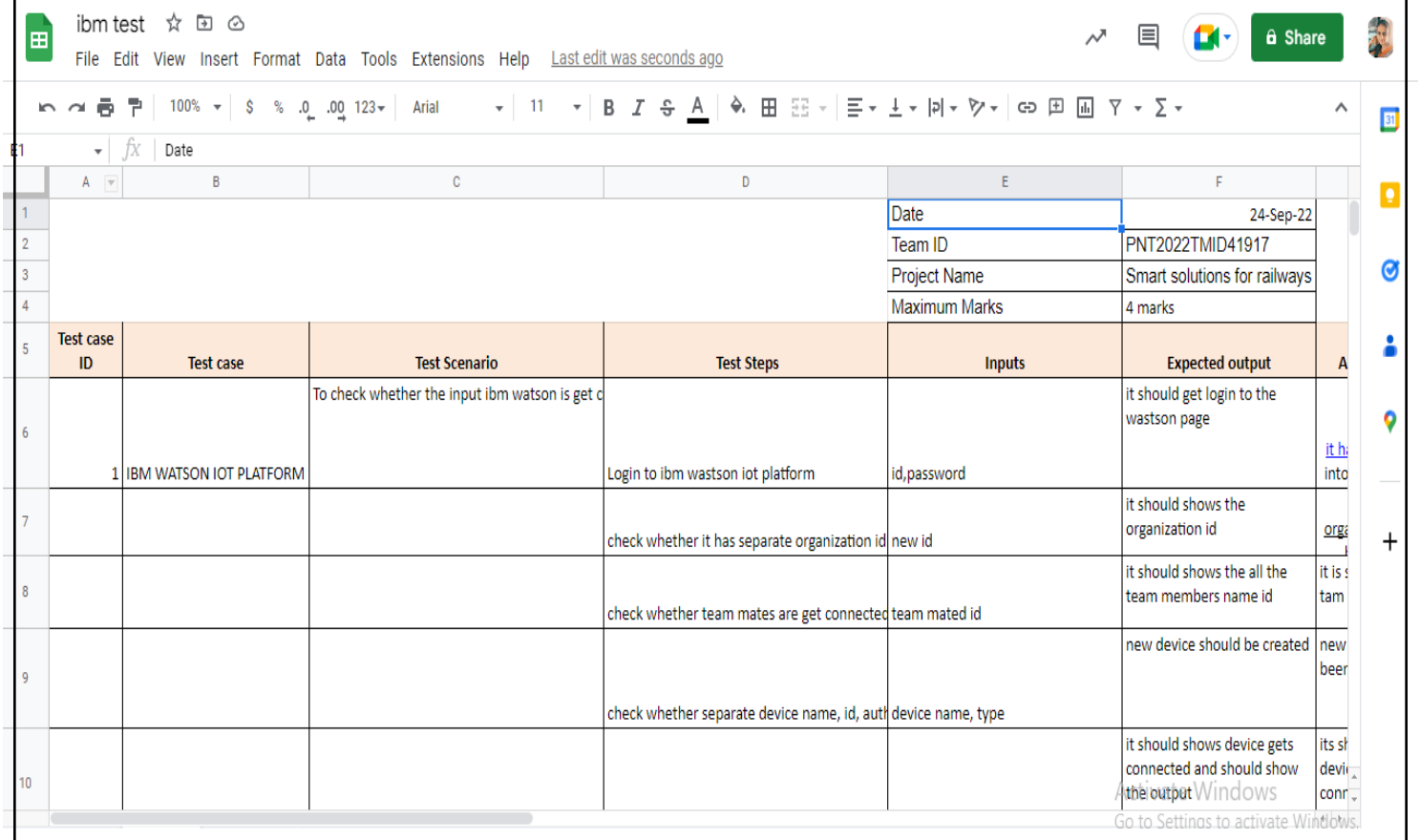
```
decodeObjects = pyzbar.decode(frame)
for obj in decodeObjects:
    #print("Data",obj.data)
    a=obj.data.decode('UTF-8')
    cv2.putText(frame,"Ticket",(50, 50),font, 2,(255,0, 0),3)
    #print(a)
try:
    responce = service.get_document(
    db='booking',
    doc_id = a
    ).get_result()
    print(response)
    time.sleep(5)
except Exception as e:
    print ("Not valid Ticket")
    time.sleep(5)

    CV2.imshow("Frame", frame)
if cv2.waitKey[1] & 0XFF == ord('q'):
    break
```

```
  cap.release()
  cv2.destroyAllWindows()
client.disconnect()
```

8 TESTING

8.1 TEST CASES



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Date	24-Sep-22	
Team ID	PNT2022TMID41917	
Project Name	Smart solutions for railways	
Maximum Marks	4 marks	

Test case ID	Test case	Test Scenario	Test Steps	Inputs	Expected output	A
1	IBM WATSON IOT PLATFORM	To check whether the input ibm watson is get c	Login to ibm wastson iot platform	id,password	it should get login to the wastson page	it h into
			check whether it has separate organization id	new id	it should shows the organization id	orga
			check whether team mates are get connected	team mated id	it should shows the all the team members name id	it is tam
			check whether separate device name, id, auth	device name, type	new device should be created	new beer
					it should shows device gets connected and should show the output	its sh devi conn

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Good

	F	G	H	I	J	K	L	M	N
2	PNT2022TMID41917								
3	Smart solutions for railways								
4	4 marks								
5	**Expected output**	**Actual output**	**Test results**	**Test Comments**	**Bug Id**	**Tested BY**			
6	it should get login to the wastson page	it has been logged into the login page	pass	Good		Prabhakaran P			
7	it should shows the organization id	separate organization id has	pass	Good		Prabhakaran P			
8	it should shows the all the team members name id	it is showing all the tam members	pass	Good		Prabhakaran P			
9	new device should be created	new device has been created	pass	Good		Prabhakaran P			
10	it should shows device gets connected and should show the output	its shwoing that device gest connected and output are verified	pass	Good		Prabhakaran P			

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Rename

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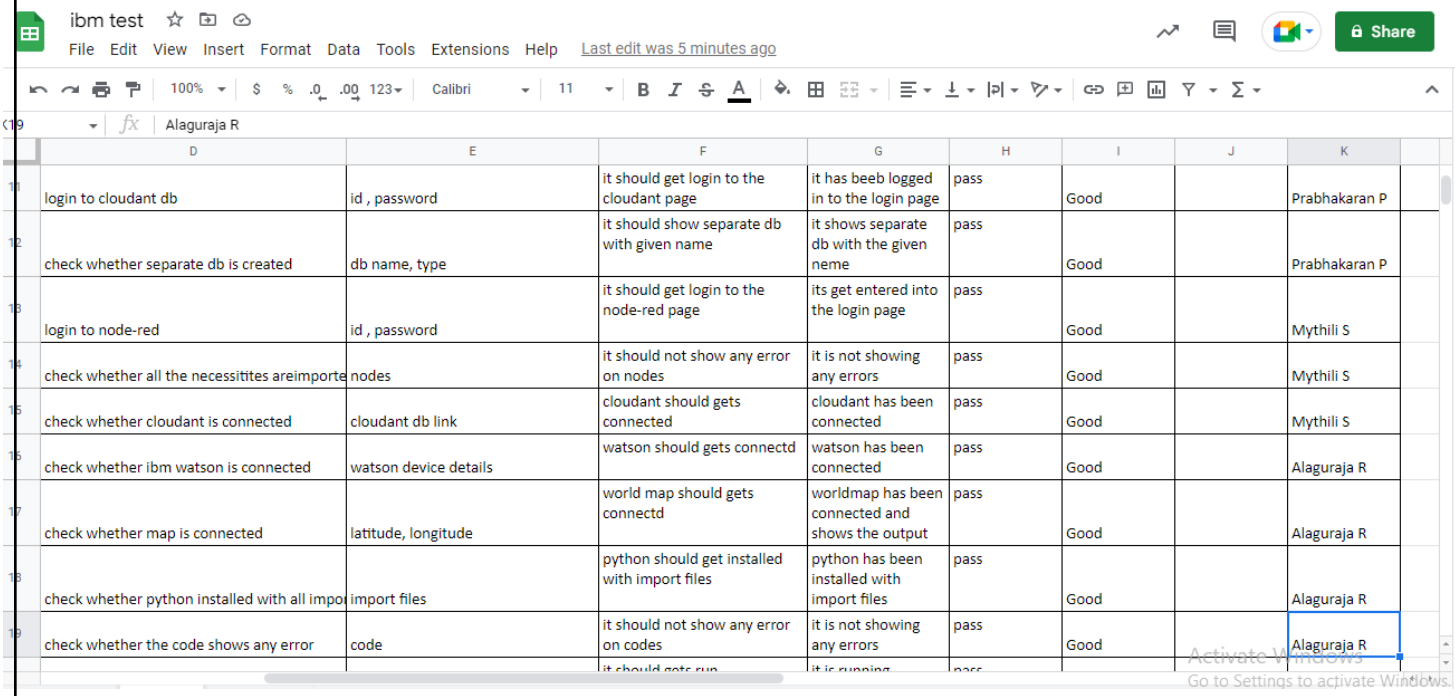
TRACKING

	A	B	C	D	E	F	
1	2	CLOUDANT DB	To check whether db is connected	login to cloudant db	id , password	it should get login to the cloudant page	it ha in to
2				check whether separate db is created	db name, type	it should show separate db with given name	it sh db w nem
3	3	NODE-RED	to check whether node-red is connected and sh	login to node-red	id , password	it should get login to the node-red page	its g the l
4				check whether all the necessitites areimporte	nodes	it should not show any error on nodes	it is any
5				check whether cloudant is connected	cloudant db link	cloudant should gets connected	clou conn
6				check whether ibm watson is connected	watson device details	watson should gets connectd	wats conn
7				check whether map is connected	lattitude, longitude	world map should gets connectd	worl conn shov
8	4	TRACKING	check whether it locates the latitude and longit	check whether python installed with all impo	import files	python should get installed with import files	pyth insta impo
9				check whether the code shows any error	code	it should not show any error on codes	it is any



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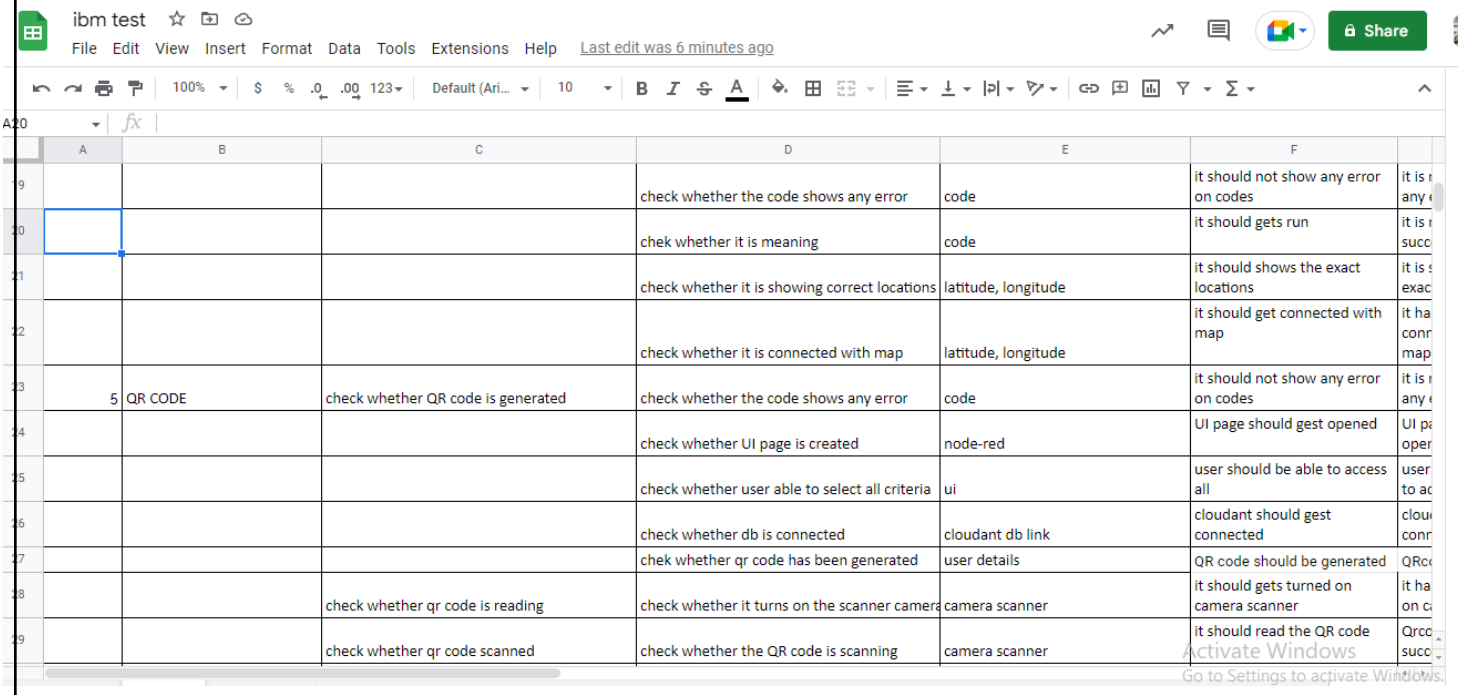
	D	E	F	G	H	I	J	K
11	login to cloudant db	id , password	it should get login to the cloudant page	it has beeb logged in to the login page	pass	Good		Prabhakaran P
12	check whether separate db is created	db name, type	it should show separate db with given name	it shows separate db with the given neme	pass	Good		Prabhakaran P
13	login to node-red	id , password	it should get login to the node-red page	its get entered into the login page	pass	Good		Mythili S
14	check whether all the necessitites areimporte	nodes	it should not show any error on nodes	it is not showing any errors	pass	Good		Mythili S
15	check whether cloudant is connected	cloudant db link	cloudant should gets connected	cloudant has been connected	pass	Good		Mythili S
16	check whether ibm watson is connected	watson device details	watson should gets connectd	watson has been connected	pass	Good		Alaguraja R
17	check whether map is connected	latitude, longitude	world map should gets connectd	worldmap has been connected and shows the output	pass	Good		Alaguraja R
18	check whether python installed with all impo	import files	python should get installed with import files	python has been installed with import files	pass	Good		Alaguraja R
19	check whether the code shows any error	code	it should not show any error on codes	it is not showing any errors	pass	Good		Alaguraja R



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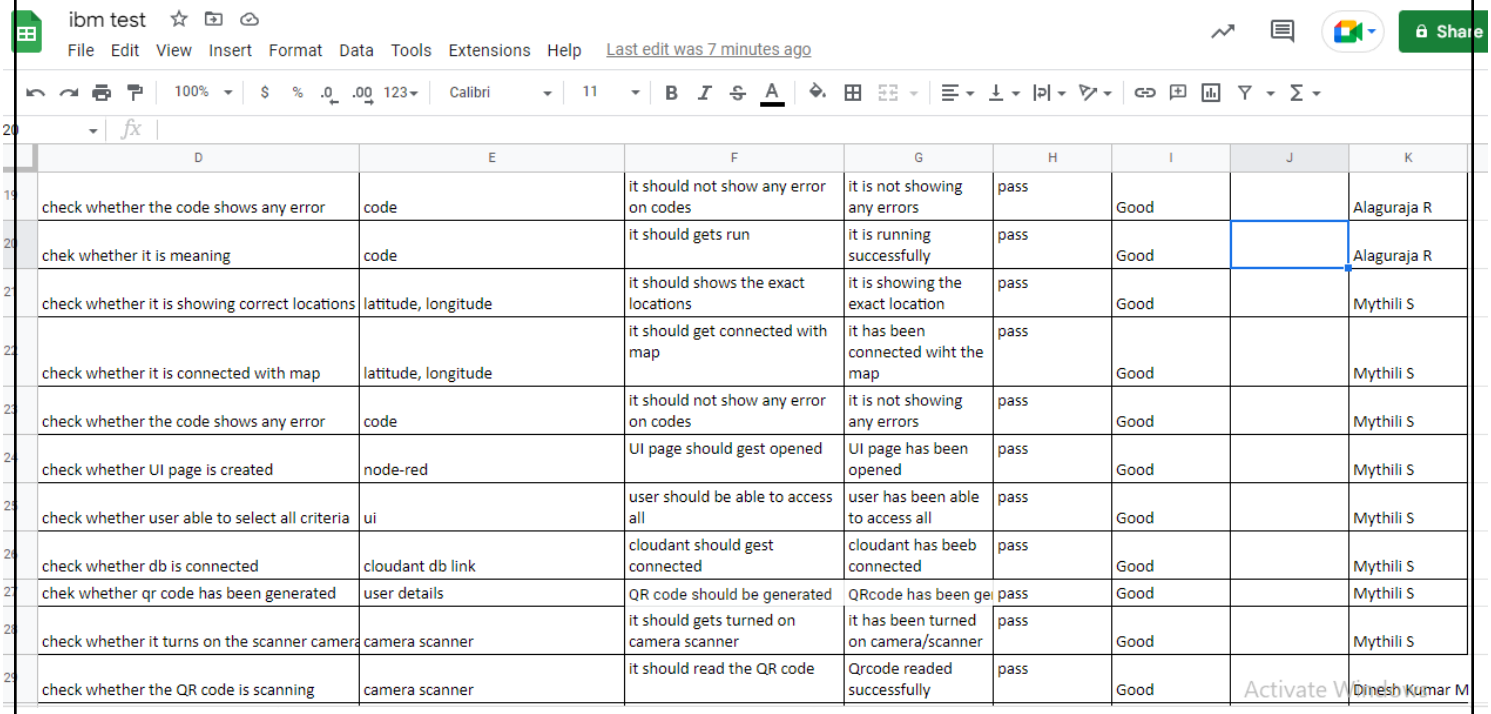
	A	B	C	D	E	F	
19				check whether the code shows any error	code	it should not show any error on codes	it is any
20				chek whether it is meaning	code	it should gets run	it is succ
21				check whether it is showing correct locations	latitude, longitude	it should shows the exact locations	it is exac
22				check whether it is connected with map	latitude, longitude	it should get connected with map	it ha conn map
23	5	QR CODE	check whether QR code is generated	check whether the code shows any error	code	it should not show any error on codes	it is any
24				check whether UI page is created	node-red	UI page should gest opened	UI pa oper
25				check whether user able to select all criteria	ui	user should be able to access all	user to ac
26				check whether db is connected	cloudant db link	cloudant should gest connected	clou conn
27				chek whether qr code has been generated	user details	QR code should be generated	QRc
28			check whether qr code is reading	check whether it turns on the scanner camera	camera scanner	it should gets turned on camera scanner	it ha on c
29			check whether qr code scanned	check whether the QR code is scanning	camera scanner	it should read the QR code	Qrco succ



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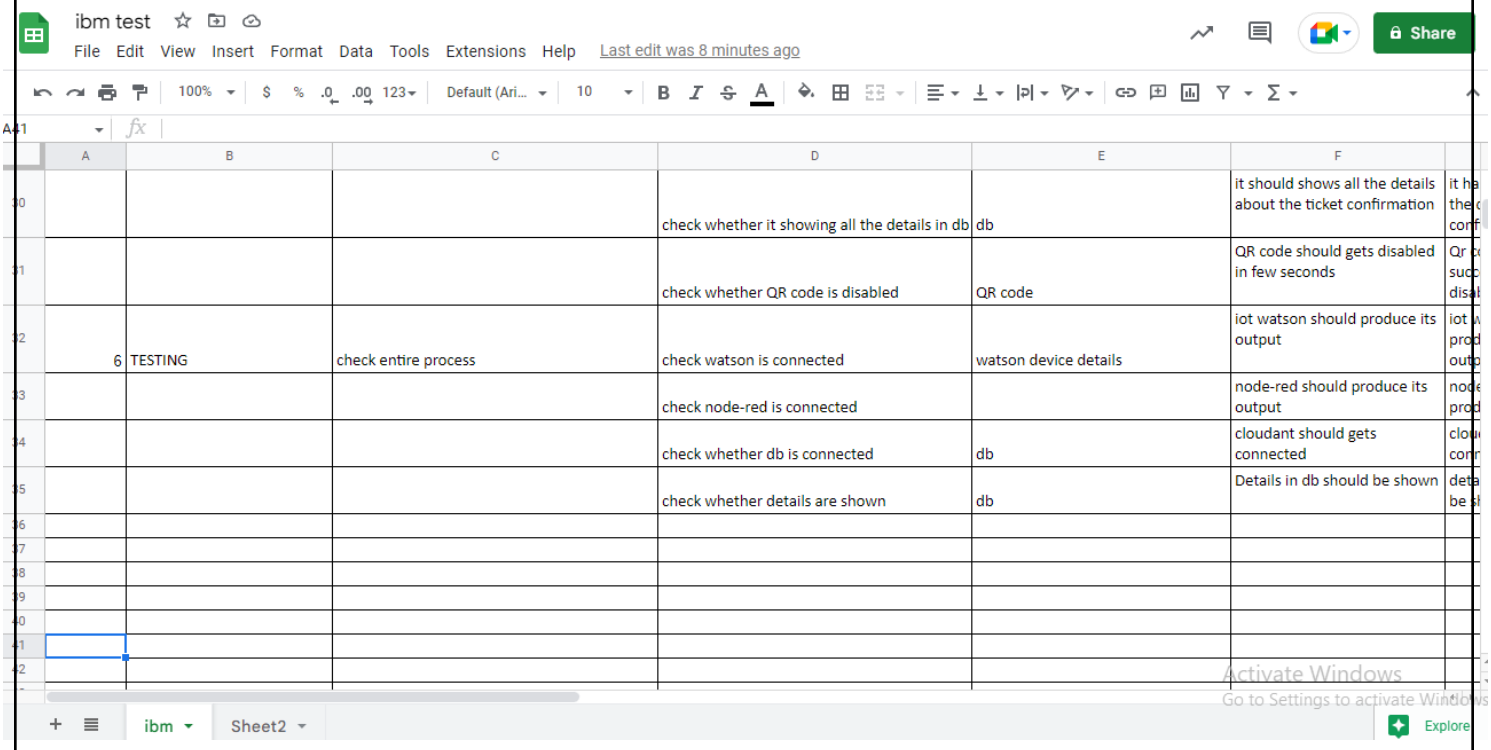
	D	E	F	G	H	I	J	K
19	check whether the code shows any error	code	it should not show any error on codes	it is not showing any errors	pass	Good		Alaguraja R
20	chek whether it is meaning	code	it should gets run	it is running successfully	pass	Good		Alaguraja R
21	check whether it is showing correct locations	latitude, longitude	it should shows the exact locations	it is showing the exact location	pass	Good		Mythili S
22	check whether it is connected with map	latitude, longitude	it should get connected with map	it has been connected wiht the map	pass	Good		Mythili S
23	check whether the code shows any error	code	it should not show any error on codes	it is not showing any errors	pass	Good		Mythili S
24	check whether UI page is created	node-red	UI page should gest opened	UI page has been opened	pass	Good		Mythili S
25	check whether user able to select all criteria	ui	user should be able to access all	user has been able to access all	pass	Good		Mythili S
26	check whether db is connected	cloudant db link	cloudant should gest connected	cloudant has beeb connected	pass	Good		Mythili S
27	chek whether qr code has been generated	user details	QR code should be generated	QRcode has been ge	pass	Good		Mythili S
28	check whether it turns on the scanner camera	camera scanner	it should gets turned on camera scanner	it has been turned on camera/scanner	pass	Good		Mythili S
29	check whether the QR code is scanning	camera scanner	it should read the QR code	Qrcode readed successfully	pass	Good		Dinesh Kumar M



ibm test

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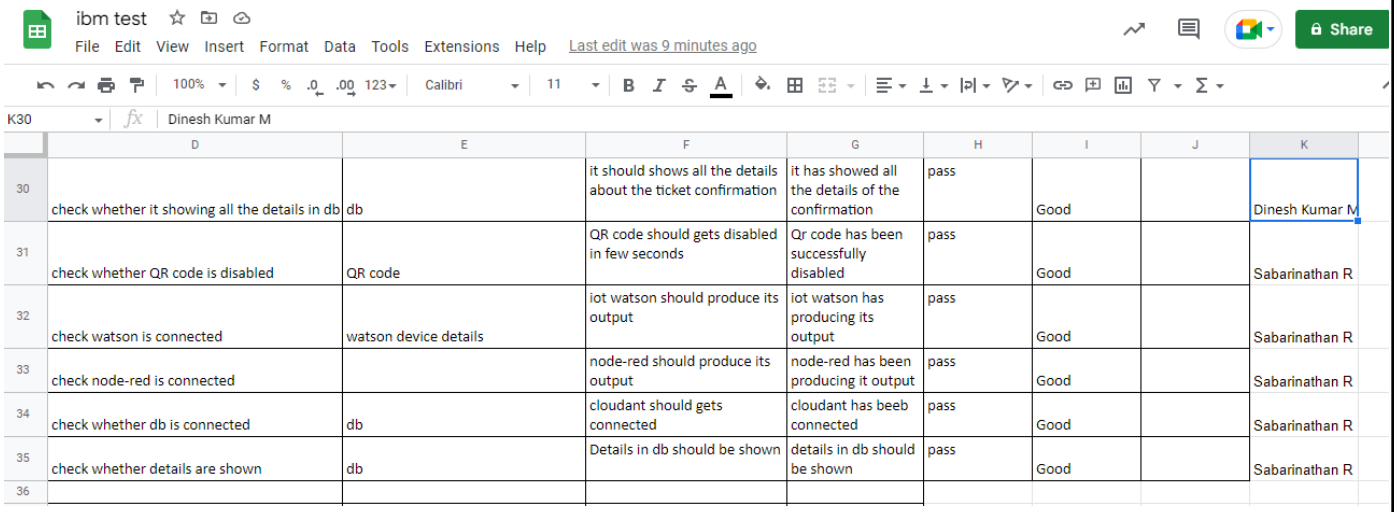
Share

	A	B	C	D	E	F
30				check whether it showing all the details in db	db	it should shows all the details about the ticket confirmation
31				check whether QR code is disabled	QR code	QR code should gets disabled in few seconds
32	6	TESTING	check entire process	check watson is connected	watson device details	iot watson should produce its output
33				check node-red is connected		node-red should produce its output
34				check whether db is connected	db	cloudant should gets connected
35				check whether details are shown	db	Details in db should be shown
36						
37						
38						
39						
40						
41						
42						

ibm Sheet2

Explore

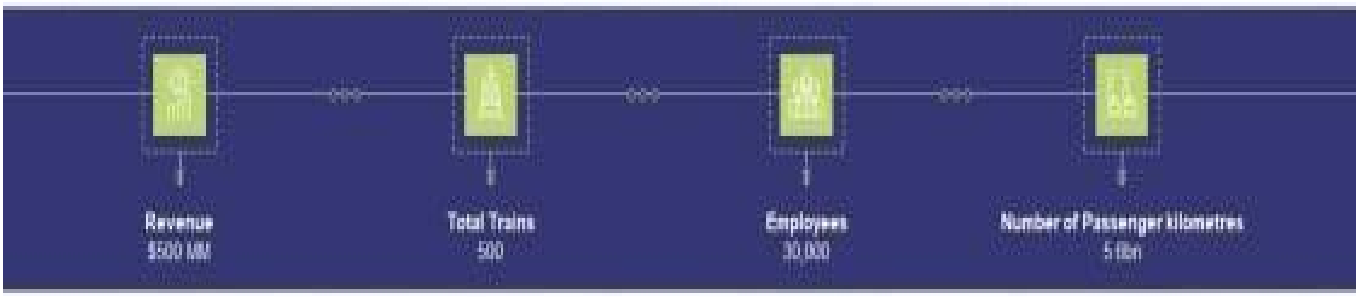


	D	E	F	G	H	I	J	K
30	check whether it showing all the details in db	db	it should shows all the details about the ticket confirmation	it has showed all the details of the confirmation	pass	Good		Dinesh Kumar M
31	check whether QR code is disabled	QR code	QR code should gets disabled in few seconds	Qr code has been successfully disabled	pass	Good		Sabarinathan R
32	check watson is connected	watson device details	iot watson should produce its output	iot watson has producing its output	pass	Good		Sabarinathan R
33	check node-red is connected		node-red should produce its output	node-red has been producing it output	pass	Good		Sabarinathan R
34	check whether db is connected	db	cloudant should gets connected	cloudant has beeb connected	pass	Good		Sabarinathan R
35	check whether details are shown	db	Details in db should be shown	details in db should be shown	pass	Good		Sabarinathan R
36								

9.RESULTS

9.1 PERFORMANCE METRICES

Today's Trains	Current Trains Route
Train 1	Route 1
Train 2	Route 2
Train 3	Route 3
Train 4	Route 4
Train 5	Route 5
Train 6	Route 6
Train 7	Route 7



10. ADVANTAGES AND DISADVANTAGES

10.1 ADVANTAGES

- Openness – compatibility between different system modules, potentially from differentvendors;
- Orchestration – ability to manage large numbers of devices, with full visibility over them;
- Dynamic scaling – ability to scale the system according to the application needs, through resource virtualization and cloud operation;
- Automation – ability to automate parts of the system monitoring application, leading to better performance and lower operation costs.

10.2 DISADVANTAGES

- Approaches to flexible, effective, efficient, and low-cost data collection for bothrailway vehicles and infrastructure monitoring, using regular trains;
- Data processing, reduction, and analysis in local controllers, and subsequent sending ofthat data to the cloud, for further processing;
- Online data processing systems, for real-time monitoring, using emergingcommunication technologies;
- Integrated, interoperable, and scalable solutions for railway systems preventivemaintenance.

11. CONCLUSION

A significant number of lives are lost as a result of accidents in the rail transportation system. Thus, this system aids in the prevention of accidents by informing the railroad authorities in advance of any faults or cracks. so that they can be fixed and the number of accidents decreases. This undertaking is economical. They can be improved and enhanced in accordance with their applications by utilising more strategies. By preventing accidents, this technology can save many lives. Long-term large-scale implementation of the concept is possible to support improved rail track safety requirements and offer efficient testing infrastructure for improved outcomes in the future.

12. FUTURE SCOPES

In future CCTV systems with IP based camera can be used for monitoring the visual videos captured from the track. It will also increase security for both passengers and railways. GPS can also be used to detect exact location of track fault area, IP cameras canalso be used to show fault with the help of video. Locations on Google maps with the helpof sensors can be used to detect in which area track is broken.

13. APPENDIX

13.1 SOURCE PROGRAM

```
import math, random import os

import smtplib import sqlite3 import requests

from bs4 import BeautifulSoup

from django.contrib.auth.base_user import AbstractBaseUser from django.db
import models

import logging import pandas as pd import pyttsx3

from plyer import notification import time

import numpy as np

import matplotlib.pyplot as plt

from PIL import Image, ImageDraw from pickle import load,dump import
smtplib, ssl

from email.mime.text import MIMEText

from email.mime.multipart import MIMEMultipart import email

from email import encoders

from email.mime.base import MIMEBase

import attr

from flask import Blueprint, flash, redirect, request, url_for from flask.views
import MethodView

from flask_babelplus import gettext as _

from flask_login import current_user, login_required

from pluggy import HookimplMarker

from tkinter import* base = Tk()

base.geometry("500x500") base.title("registration form")

labl_0 = Label(base, text="Registration form",width=20,font=("bold", 20))
```

```
labl_0.place(x=90,y=53)

lb1= Label(base, text="Enter Name", width=10, font=("arial",12))
lb1.place(x=20, y=120)

en1= Entry(base) en1.place(x=200, y=120)

lb3= Label(base, text="Enter Email", width=10, font=("arial",12))
lb3.place(x=19, y=160)

en3= Entry(base) en3.place(x=200, y=160)

lb4= Label(base, text="Contact Number", width=13,font=("arial",12))
lb4.place(x=19, y=200)

en4= Entry(base) en4.place(x=200, y=200)

lb5= Label(base, text="Select Gender", width=15, font=("arial",12))
lb5.place(x=5, y=240)

var = IntVar()

Radiobutton(base, text="Male", padx=5,variable=var,

value=1).place(x=180, y=240)

Radiobutton(base, text="Female", padx =10,variable=var,
value=2).place(x=240,y=240)

Radiobutton(base, text="others", padx=15, variable=var,
value=3).place(x=310,y=240)

list_of_cntry = ("United States", "India", "Nepal", "Germany") cv = StringVar()

drplist= OptionMenu(base, cv, *list_of_cntry) drplist.config(width=15)

cv.set("United States")

lb2= Label(base, text="Select Country", width=13,font=("arial",12))
lb2.place(x=14,y=280)

drplist.place(x=200, y=275)

lb6= Label(base, text="Enter Password", width=13,font=("arial",12))
lb6.place(x=19, y=320)

en6= Entry(base, show='*') en6.place(x=200, y=320)

lb7= Label(base, text="Re-Enter Password", width=15,font=("arial",12))

lb7.place(x=21, y=360)

en7 =Entry(base, show='*') en7.place(x=200, y=360)
```

Button(base, text="Register", width=10).place(x=200,y=400) base.mainloop()

def generateOTP() :

Declare a digits variable # which stores all digits digits = "0123456789" OTP = ""

length of password can be changed # by changing value in range

for i in range(4) :

OTP += digits[math.floor(random.random() * 10)] return OTP

Driver code

If name== "main" :

print("OTP of 4 digits:", generateOTP()) digits="0123456789"

OTP=""

for i in range(6): OTP+=digits[math.floor(random.random()*10)]

otp = OTP + " is your OTP" msg= otp

s = smtplib.SMTP('smtp.gmail.com', 587) s.starttls()

s.login("Your Gmail Account", "You app password") emailid = input("Enter your email: ") s.sendmail('&&&&&&&&&&&',emailid,msg)

a = input("Enter Your OTP >>: ")

if a == OTP: print("Verified")

else:

print("Please Check your OTP again") root = Tk()

root.title("Python: Simple Login Application") width = 400

height = 280

screen_width = root.winfo_screenwidth() screen_height = root.winfo_screenheight() x = (screen_width/2) - (width/2)

y = (screen_height/2) - (height/2) root.geometry("%dx%d+%d+%d" % (width, height, x, y)) root.resizable(0, 0)

USERNAME = StringVar() PASSWORD = StringVar()

Top = Frame(root, bd=2, relief=RIDGE) Top.pack(side=TOP, fill=X)

Form = Frame(root, height=200) Form.pack(side=TOP, pady=20)

```
lbl_title = Label(Top, text = "Python: Simple Login Application", font=('arial',
15))

lbl_title.pack(fill=X)

lbl_username = Label(Form, text = "Username:", font=('arial', 14), bd=15)

lbl_username.grid(row=0, sticky="e")

lbl_password = Label(Form, text = "Password:", font=('arial', 14), bd=15)

lbl_password.grid(row=1, sticky="e") lbl_text = Label(Form)

lbl_text.grid(row=2, columnspan=2)

username = Entry(Form, textvariable=USERNAME, font=(14))
username.grid(row=0, column=1)

password = Entry(Form, textvariable=PASSWORD, show="*", font=(14))

password.grid(row=1, column=1) def Database():

global conn, cursor

conn = sqlite3.connect("pythontut.db") cursor = conn.cursor()

cursor.execute("CREATE TABLE IF NOT EXISTS `member` (mem_id
INTEGER NOT NULL PRIMARY KEY

AUTOINCREMENT, username TEXT, password TEXT)")
cursor.execute("SELECT * FROM `member` WHERE `username` =

'admin' AND `password` = 'admin'")

if cursor.fetchone() is None:

cursor.execute("INSERT INTO `member` (username, password)
VALUES('admin', 'admin')")

conn.commit()

def Login(event=None): Database()

if USERNAME.get() == "" or PASSWORD.get() == "":

lbl_text.config(text="Please complete the required field!", fg="red") else:

cursor.execute("SELECT * FROM `member` WHERE `username`

= ? AND `password` = ?", (USERNAME.get(), PASSWORD.get())) if
cursor.fetchone() is not None:

HomeWindow() USERNAME.set("")
```

PASSWORD.set("")

lbl_text.config(text="")

else:

lbl_text.config(text="Invalid username or password", fg="red")
USERNAME.set("")

PASSWORD.set("")

cursor.close() conn.close()

btn_login = Button(Form, text="Login", width=45, command=Login)
btn_login.grid(pady=25, row=3, columnspan=2) btn_login.bind('<Return>', Login)

def HomeWindow(): global Home root.withdraw() Home = Toplevel()

Home.title("Python: Simple Login Application") width = 600

height = 500

screen_width = root.winfo_screenwidth() screen_height = root.winfo_screenheight() x = (screen_width/2) - (width/2)

y = (screen_height/2) - (height/2) root.resizable(0, 0)

Home.geometry("%dx%d+%d+%d" % (width, height, x, y)) lbl_home = Label(Home, text="Successfully Login!", font=('times new

roman', 20)).pack()

btn_back = Button(Home, text='Back', command=Back).pack(pady=20, fill=X)

def Back():

Home.destroy() root.deiconify()

def getdata(url):

r = requests.get(url) return r.text

input by geek from_Station_code = "GAYA" from_Station_name = "GAYA"

To_station_code = "PNBE" To_station_name = "PATNA" # url

url = "https://www.railyatri.in/booking/trains-between-stations?from_code="+from_Station_code+"&from_name="+from_Stat ion_name+"+JN+&journey_date=+Wed&src=tbs&to_code=" + \

```
To_station_code+"&to_name="+To_station_name + \ "+JN+&user_id=-
1603228437&user_token=355740&utm_source=dwebsearch_tbs_search_
trains"
# pass the url
# into getdata function htmldata = getdata(url)
soup = BeautifulSoup(htmldata, 'html.parser')
# find the Html tag # with find()
# and convert into string
data_str = ""
for item in soup.find_all("div", class_="col-xs-12 TrainSearchSection"):
data_str = data_str + item.get_text()
result = data_str.split("\n")
print("Train between "+from_Station_name+" and "+To_station_name)
print("")
# Display the result for item in result:
if item != "": print(item)
print("\n\nTicket Booking System\n") restart = ('Y')
while restart != ('N','NO','n','no'):
print("1.Check PNR status") print("2.Ticket Reservation")
option = int(input("\nEnter your option : "))
if option == 1:
print("Your PNR status is t3") exit(0)"))
elif option == 2:
people = int(input("\nEnter no. of Ticket you want :
name_l = [] age_l = [] sex_l = []
 for p in range(people):
name = str(input("\nName : ")) name_l.append(name)
age = int(input("\nAge : ")) age_l.append(age)
sex = str(input("\nMale or Female : ")) sex_l.append(sex)
```

```
"))
 restart = str(input("\nDid you forgot someone? y/n:
if restart in ('y','YES','yes','Yes'): restart = ('Y')
 else :
x = 0
print("\nTotal Ticket : ",people) for p in range(1,people+1):
print("Ticket : ",p)
print("Name : ", name_l[x])
print("Age : ", age_l[x])
print("Sex : ",sex_l[x]) x += 1
```

GITHUB LINK :

https://github.com/IBM-EPBL/IBM-Project-44465-1660724748

VIDEO LINK :

https://youtu.be/DgnZka7jHEI