SMART SOLUTIONS FOR RAILWAYS

A PROJECT REPORT

Submitted by

in partial fulfillment for the award of the degree

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PROJECT REPORT

INTRODUCTION

1. INTRODUCTION

1.1 PROJECT OVERVIEW

Smart Solutions For Railways is to manage Indian Railways is the largest railway network in Asia and additionally world's second largest network operated underneath a single management. Due to its large size it is difficult to monitor the cracks in tracks manually. This paper deals with this problem and detects cracks in tracks with the help of ultrasonic sensor attached to moving assembly with help of stepper motor. Ultrasonic sensor allows the device to moves back and forth across the track and if there is any fault, it gives information to the cloud server through which railway department is informed on time about cracks and many lives can be saved. This is the application of IoT, due to this it is cost effective system. This effective methodology of continuous observation and assessment of rail tracks might facilitate to stop accidents. This methodology endlessly monitors the rail stress, evaluate the results and provide the rail break alerts such as potential buckling conditions, bending of rails and wheel impact load detection to the concerned authorities.

1.2. PURPOSE

Internet is basically system of interconnected computers through network. But now its use is changing with changing world and it is not just confined to emails or web browsing. Today’s internet also deals with embedded sensors and has led to development of smart homes, smart rural area, e-health care’s etc. and this introduced the concept of IoT . Internet of Things refers to interconnection or communication between two or more devices without humanto-human and human-to-computer interaction. Connected devices are equipped with sensors or actuators perceive their surroundings. IOT has four major components which include sensing the device, accessing the device, processing the information of the device, and provides application and services. In addition to this it also provides security and privacy of data . Automation has affected every aspect of our daily lives. More improvements are being introduced in almost all fields to

reduce human effort and save time. Thinking of the same is trying to introduce automation in the field of track testing. Railroad track is an integral part of any company's asset base, since it provides them with the necessary business functionality. Problems that occur due to problems in railroads need to be overcome. The latest method used by the Indian railroad is the tracking of the train track which requires a lot of manpower and is time-consuming

LITERATURE SURVEY

LITERATURE SURVEY

2.1 EXISTING SYSTEM

In the Existing train tracks are manually researched. LED (Light Emitting Diode)

and LDR (Light Dependent Resister) sensors cannot be implemented on

the block of the tracks]. The input image processing is a clamorous system with high cost and does not give the exact result. The Automated Visual Test Method is a complicated method as the video color inspection is implemented to examine the cracks in rail track which does not give accurate result in bad weather. This traditional system delays transfer of information. Srivastava et al., (2017) proposed a moving gadget to detect the cracks with the help of an array of IR sensors to identify the actual position of the cracks as well as notify to nearest railway station . Mishra et al., (2019) developed a system to track the cracks with the help of Arduino mega power using solar energy and laser. A GSM along with a GPS module was implemented to get the actual location of the faulty tracks to inform the authorities using SMS via a link to find actual location on Google Maps. Rizvi Aliza Raza presented a prototype in that is capable of capturing photos of the track and compare it with the old database and sends a message to the authorities regarding the crack detected. The detailed analysis of traditional railway track fault detection techniques is explained in table.

2.2 REFERENCES

1. D. Hesse, “Rail Inspection Using Ultrasonic Surface Waves” Thesis, Imperial College of London, 2007.
2. Md. Reya Shad Azim1 , Khizir Mahmud2 and C. K. Das. Automatic railway 6 track switching system, International Journal of Advanced Technology, Volume 54, 2014.
3. S. Somalraju, V. Murali, G. saha and V. Vaidehi, “Title-robust railway crack detection scheme using LED (Light Emitting Diode) - LDR (Light Dependent Resistor) assembly IEEE 2012.
4. S. Srivastava, R. P. Chourasia, P. Sharma, S. I. Abbas, N. K. Singh, “Railway Track Crack detection vehicle”, IARJSET, Vol. 4, pp. 145-148, Issued in 2, Feb 2017.
5. U. Mishra, V. Gupta, S. M. Ahzam and S. M. Tripathi, “Google Map Based

Railway Track Fault Detection Over the Internet”, International Journal of Applied Engineering Research, Vol. 14, pp. 20-23, Number 2, 2019.

6. R. A. Raza, K. P. Rauf, A. Shafeeq, “Crack detection in Railway track using Image processing”, IJARIIT, Vol. 3, pp. 489-496, Issue 4, 2017.
7. N. Bhargav, A. Gupta, M. Khirwar, S. Yadav, and V. Sahu, “Automatic Fault Detection of Railway Track System Based on PLC (ADOR TAST)”, International Journal of Recent Research Aspects, Vol. 3, pp. 91-94, 2016.

2.3 PROBLEM STATEMENT DEFINITION

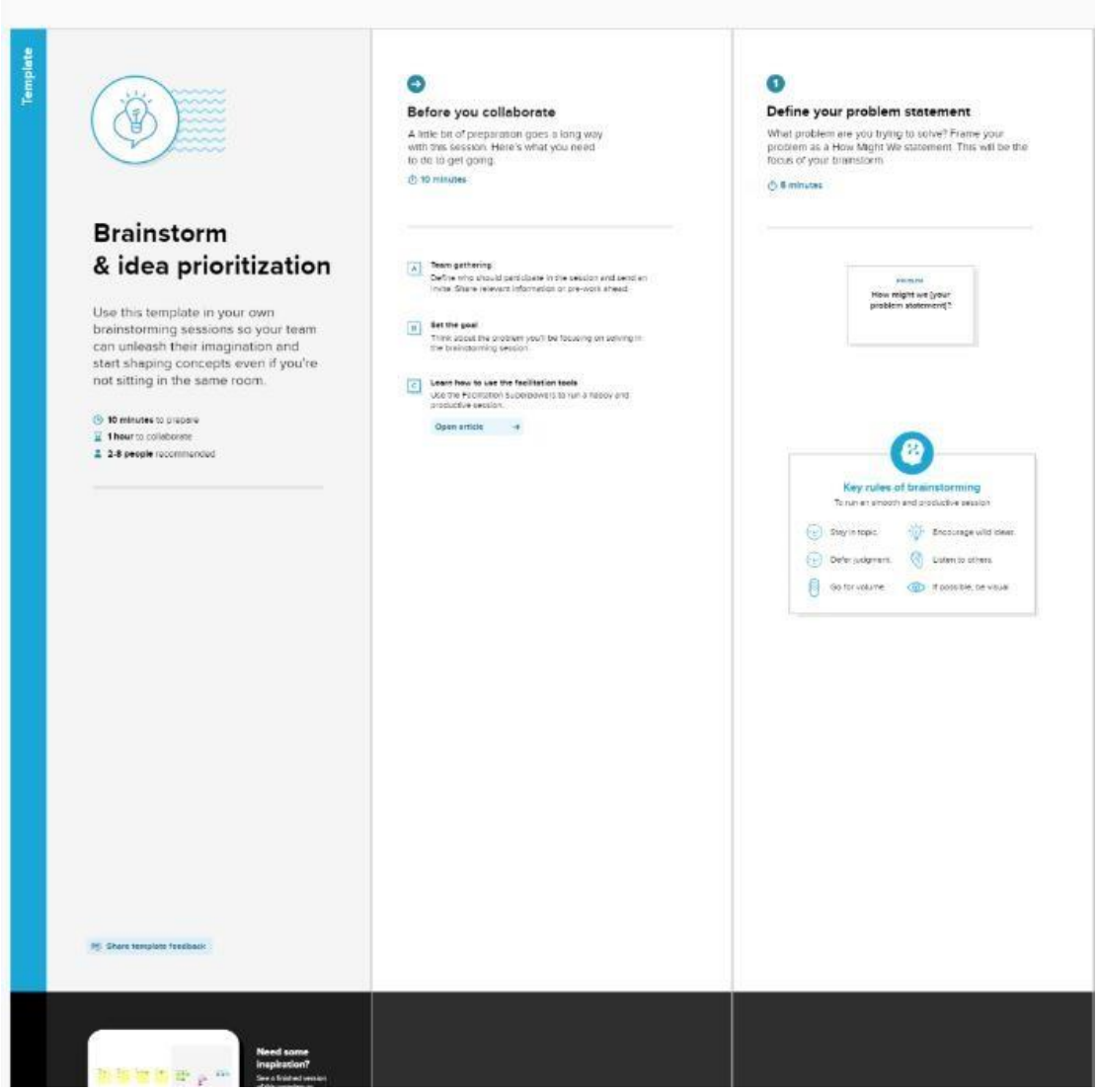
Among the various modes of transport, railways is one of the biggest modes of transport in the world. Though there are competitive threats from airlines,luxury buses, public transports, and personalized transports the problem statement is to

answer the question “What are the problems faced by the passengers while travelling by train at station and on board”.

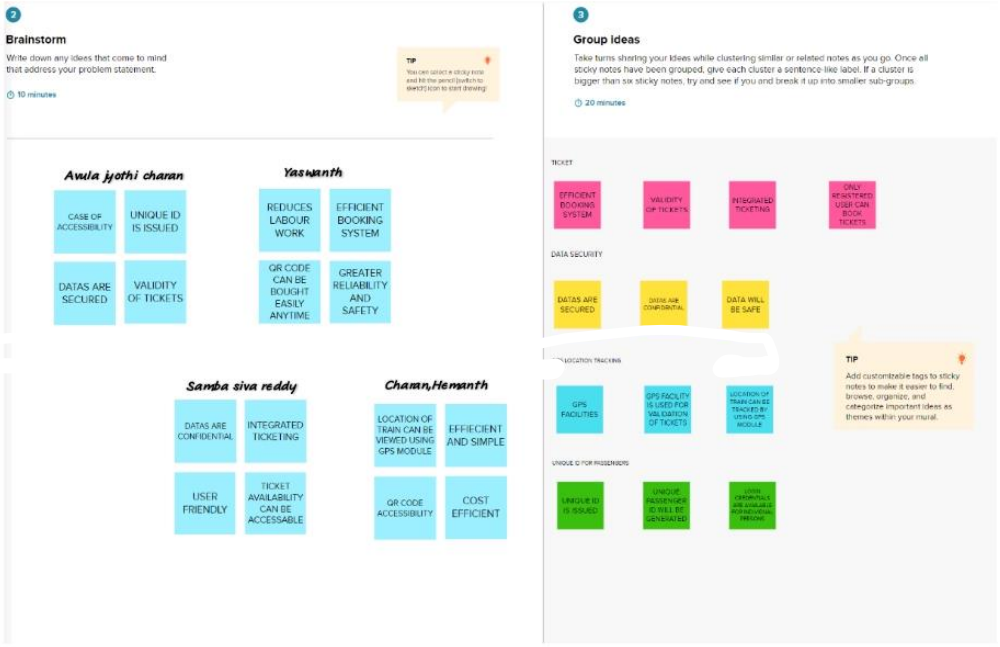
IDEATION AND PROPOSED SOLUTION

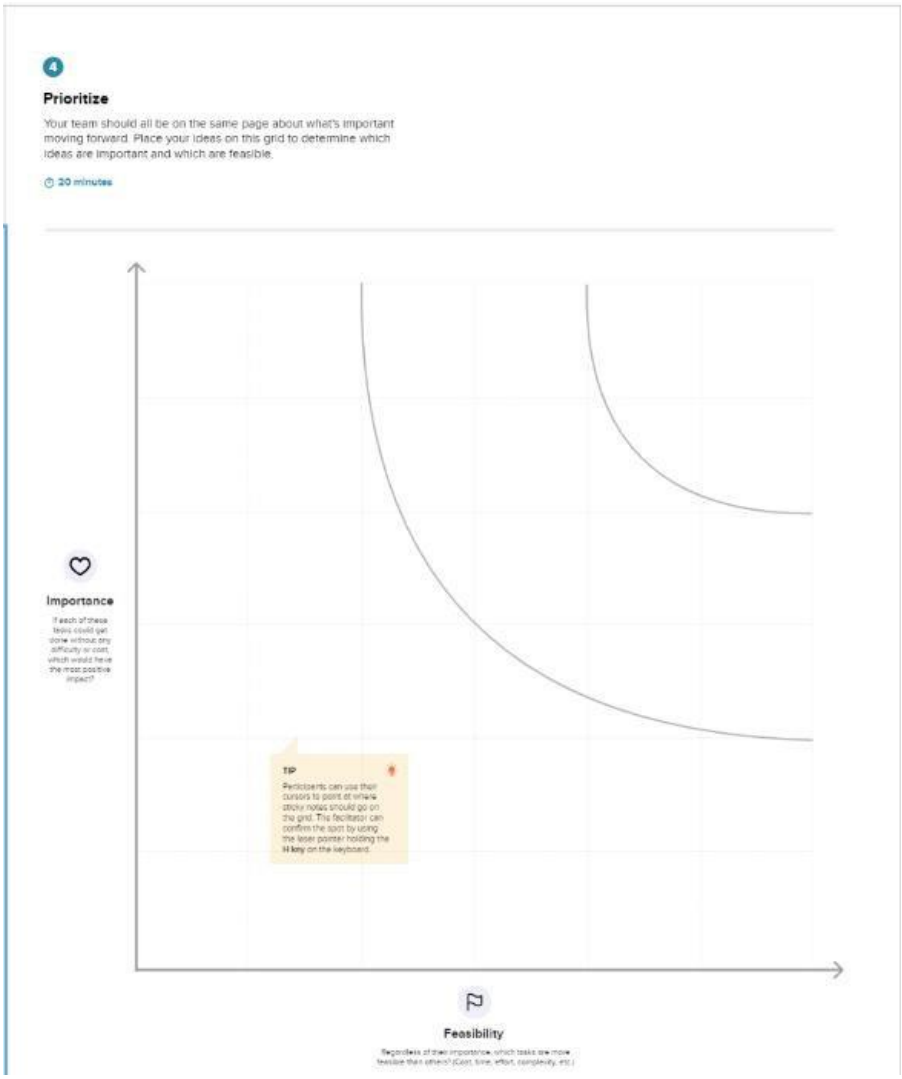
3. IDEATION AND PROPOSED SOLUTON

3.1 EMPATHY MAP CANVAS



3.2 IDEATION & BRAINSTORMING





3.3

PROPOSED SOLUTION

S.NO	PARAMETER	DESCRIPTION
1	Problem Statement (Problem to be solved)	In order to satisfy the passengers, the Railways provides various services to its passengers But, the passengers can face some problems

2	Idea / Solution description	The idea is to minimize the ticket booking problems among the passengers by providing Online mode of booking rather than papers. . In queues in front of the ticket counters in railway stations have been drasticallyincreased over the time.
3	Novelty / Uniqueness	Online mode of booking is most common and so ease of access to everyone that makes more efficient uniqueness of utilizing the technique. People can book their ticket through online and they get a QR code through SMS

4	Social Impact / Customer Satisfaction	Customers for sure they get satisfied as they are in the fast roaming world this technique makes more easier for travelling passengers. A web page is designed in which the user can book tickets and will be provided with the QR code, which will be shown to the ticket collector and by scanning the QR code the ticket collector will get the passenger details
5	Business Model (Revenue Model)	A web page is designed in which the user can book tickets and will be provided with the QR code, which will be shown to the ticket collector and by scanning the QR code the ticket collector will get the passenger details. The booking details of the user will be stored in the database, which can be retrieved any time

6	Scalability of the Solution	The scalability of this solution is most feasible among the passengers who are willing to travel. No need of taking printout

		Counter ticket has to be handled with care, but SMS on mobile is enough. No need to taking out wallet and showing your ticket to TTR just tell your name to TTR that you are a passenger with valid proof

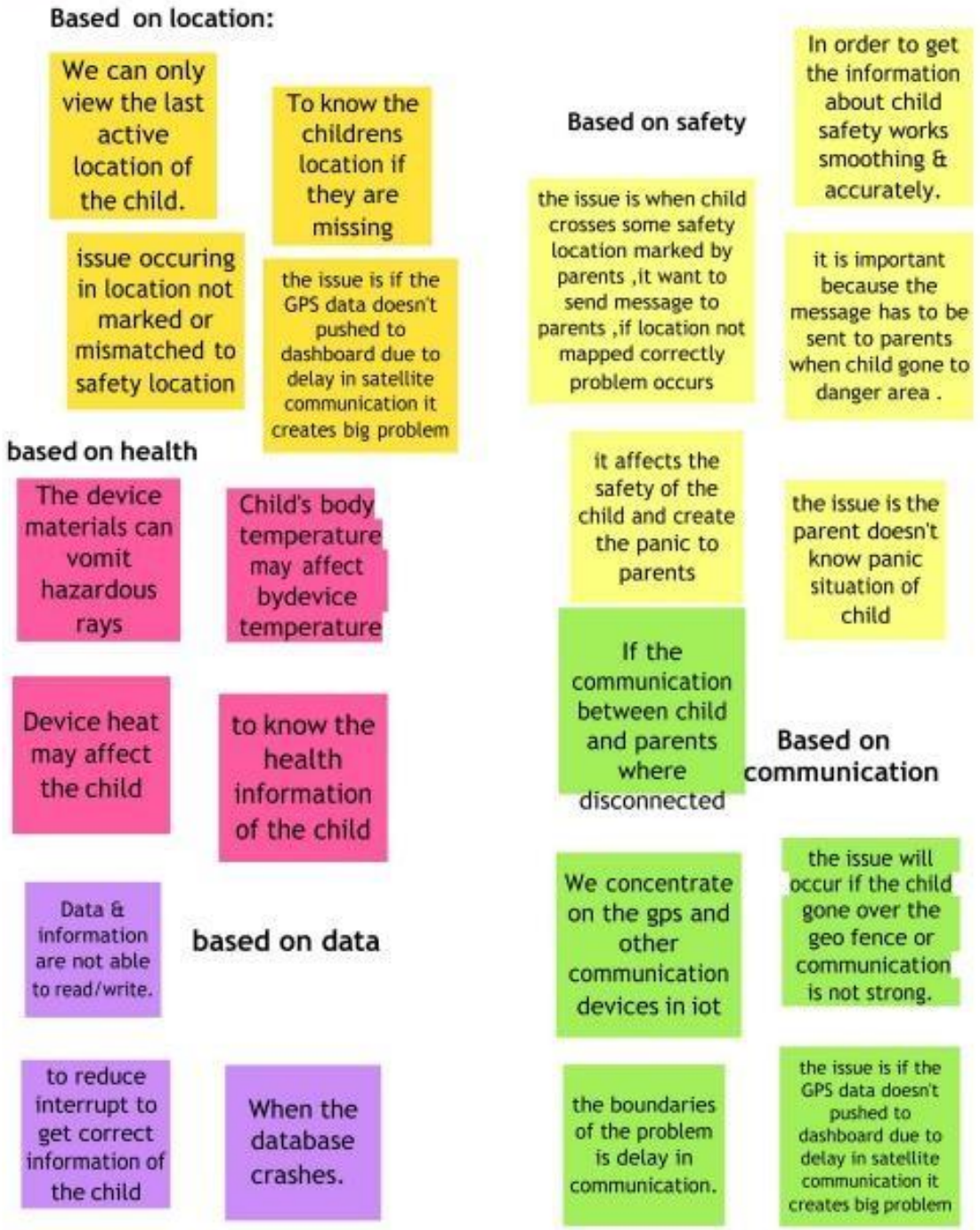
3.4 PROBLEM SOLUTION FIT

3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

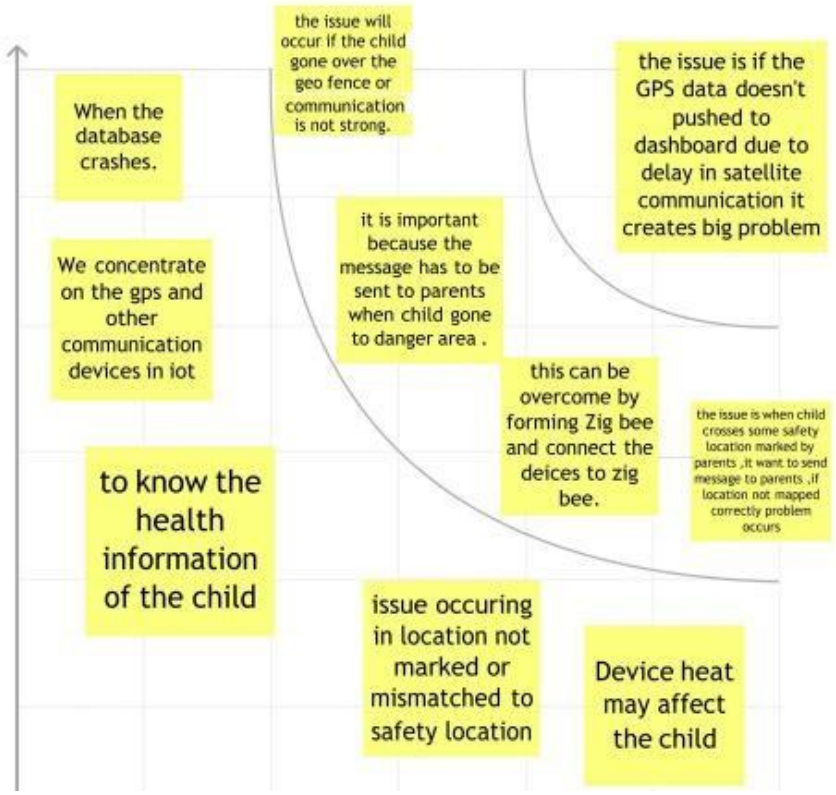
20 minutes



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



REQUIREMENT ANALYSIS

4. REQUIREMENT ANALYSIS

4.1. FUNCTIONAL REQUIREMENTS

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Unique accounts	• Every online booking needs to be associated with an account • One account cannot be associated with multiple users
FR-2	Booking options	Search results should enable users to find the most recent and relevant booking options
FR-3	Mandatory fields	System should only allow users to move to payment only when mandatory fields such as date, time, location has been mentioned
FR-4	Synchronization	System should consider timezone synchronisation when accepting bookings from different timezones
FR-5	Authentication	Booking confirmation should be sent to user to the specified contact details

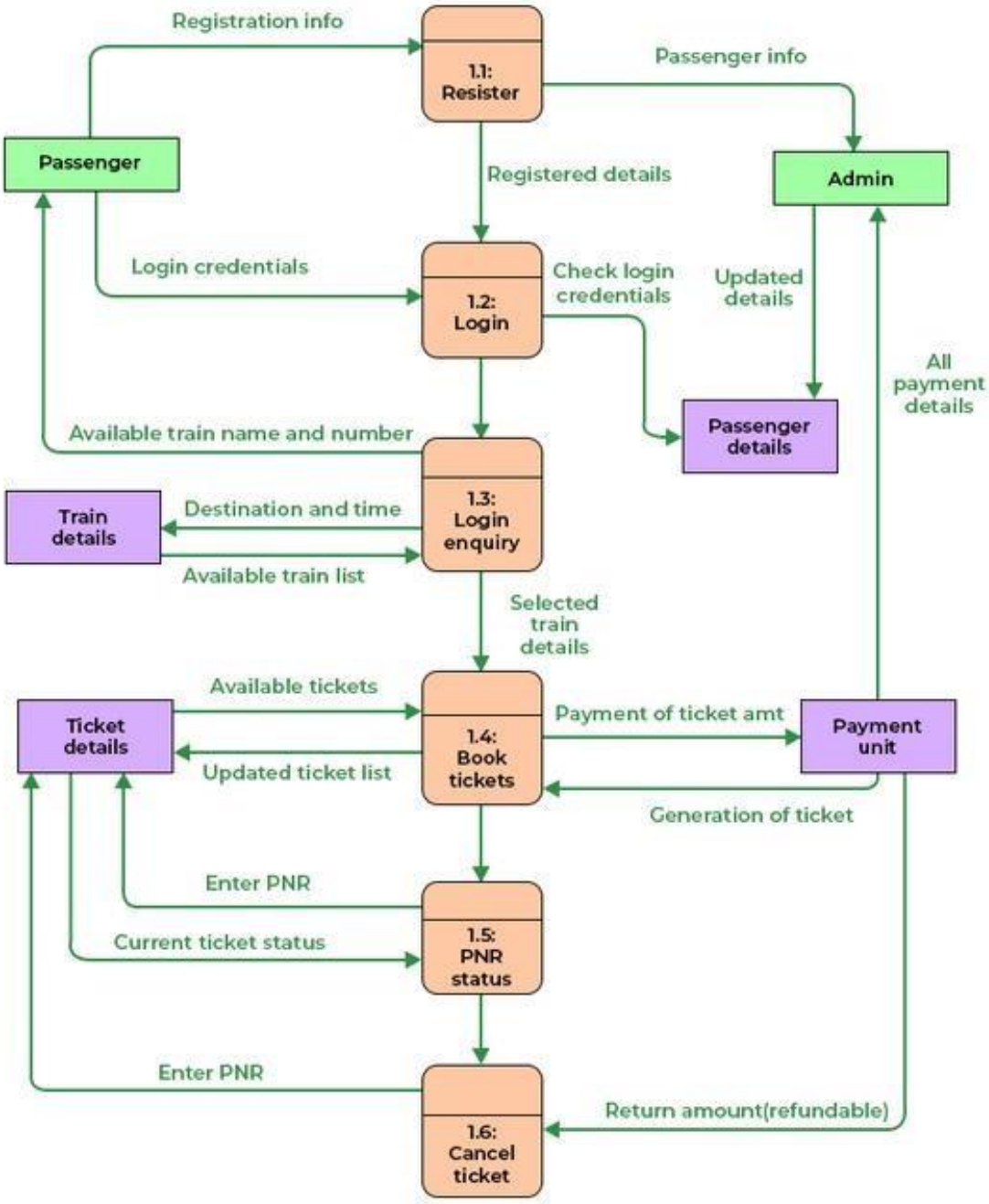
4.2 NON-FUNCTIONAL REQUIREMENTS

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Search results should populate within acceptable time limits
NFR-2	Security	System should visually confirm as well as send booking confirmation to the user's contact
NFR-3	Reliability	System should accept payments via different payment methods, like PayPal, wallets, cards, vouchers, etc
NFR-4	Performance	Search results should populate within acceptable time limits
NFR-5	Availability	User should be helped appropriately to fill in the mandatory fields, incase of invalid input
NFR-6	Scalability	Use of captcha and encryption to avoid bots from booking tickets

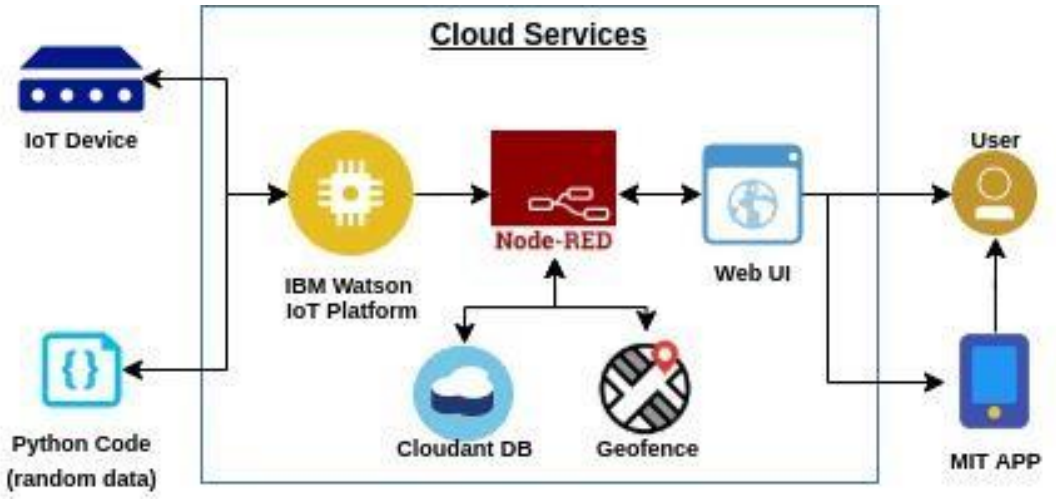
PROJECTDESIGN

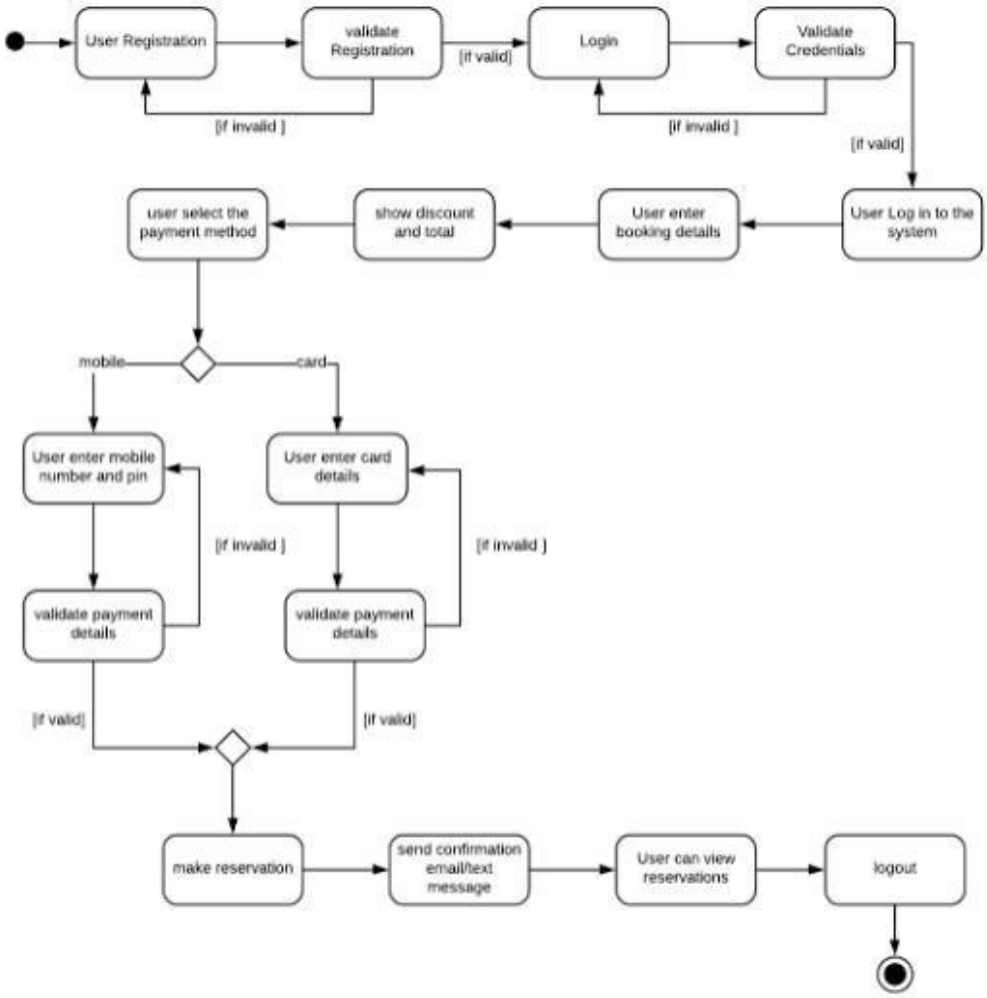
5. PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS



5.2 SOLUTION & TECHNICAL ARCHITECTURE





5.3 USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user, Web user)	Registration	USN-1	As a user, I can register through the form by Filling in my details	I can register and create my account / dashboard	High	Sprint-1
		USN-2	As a user, I can register through phone numbers, Gmail, Facebook or other social sites	I can register & create my dashboard with Facebook login or other social sites	High	Sprint-2
	Conformation	USN-3	As a user, I will receive confirmation through email or OTP once registration is successful	I can receive confirmation email & click confirm.	High	Sprint-1
	Authentication/Login	USN-4	As a user, I can login via login id and password or through OTP received on register phone number	I can login and access my account/dashboard	High	Sprint-1
	Display Train details	USN-5	As a user, I can enter the start and destination to get the list of trains available connecting the above	I can view the train details (name & number), corresponding routes it passes through based on the start and destination entered.	High	Sprint-1
	Booking	USN-6	As a use, I can provide the basic details such as a name, age, gender etc...	I will view, modify or confirm the details enter.	High	Sprint-1
		USN-7	As a user, I can choose the class, seat/berth. If a preferred seat/berth isn't available I can be allocated based on the availability.	I will view, modify or confirm the seat/class berth selected	High	Sprint-1
	Payment	USN-8	As a user, I can choose to pay through credit Card/debit card/UPI.	I can view the payment Options available and select my desirable choice To proceed with the payment	High	Sprint-1
		USN-9	As a user, I will be redirected to the selected Payment gateway and upon successful	I can pay through the payment portal and confirm the booking if any changes need to	High	Sprint-1

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
			completion of payment I'll be redirected to the booking website.	be done I can move back to the initial payment page		
	Ticket generation	USN-10	As a user, I can download the generated e-ticket for my journey along with the QR code which is used for authentication during my journey.	I can show the generated QR code so that authentication can be done quickly.	High	Sprint-1
	Ticket status	USN-11	As a user, I can see the status of my ticket Whether it's confirmed/waiting/RAC.	I can confidentially get the Information and arrange alternate transport if the ticket isn't Confirmed	High	Sprint-1
	Remainders notification	USN-12	As a user, I get remainders about my journey A day before my actual journey.	I can make sure that I don't miss the journey because of the constant notifications.	Medium	Sprint-2
		USN-13	As a user, I can track the train using GPS and can get information such as ETA, Current stop and delay.	I can track the train and get to know about the delays pian accordingly	Medium	Sprint-2
	Ticket cancellation	USN-14	As a user, I can cancel my tickets if there's any Change of plan	I can cancel the ticket and get a refund based on how close the date is to the journey.	High	Sprint-1
	Raise queries	USN-15	As a user, I can raise queries through the query box or via mail.	I can view my pervious queries.	Low	Sprint-2
Customer care Executive	Answer the queries	USN-16	As a user, I will answer the questions/doubts Raised by the customers.	I can view the queries and make it once resolved	Medium	Sprint-2
Administrator	Feed details	USN-17	As a user, I will feed information about the trains delays and add extra seats if a new compartment is added.	I can view and ensure the corrections of the information fed.	High	Sprint-1

PROJECTPLANNINGANDSCHEDULING

6. PROJECT PLANNING AND SCHEDULING

6.1. SPRINT PLANNING & ESTIMATION

SPRINT PLAN

1. Identify the Problem

2.Prepare a Abstract ,Problem Statement

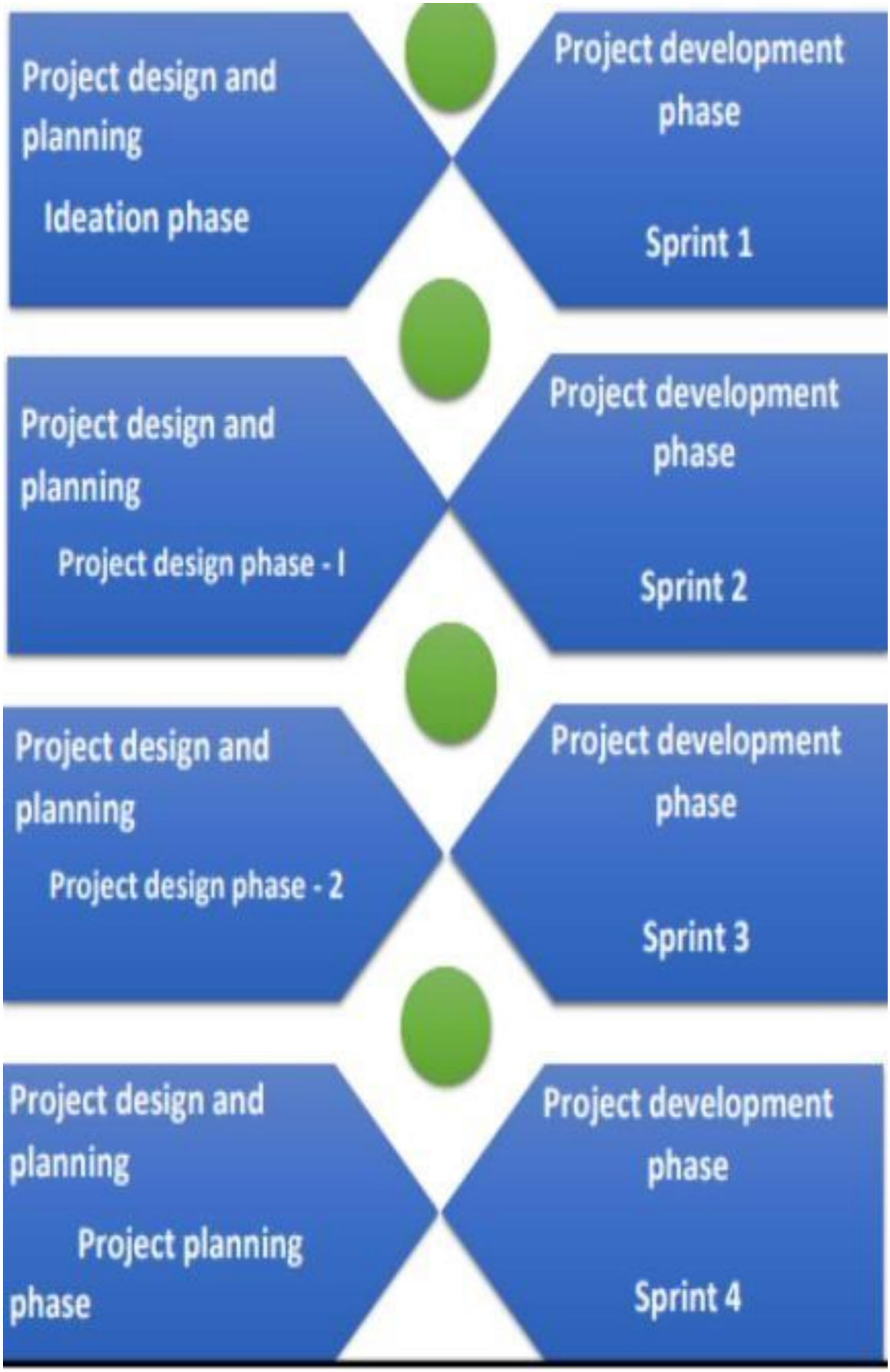
3.List a Require Needed

4.Create a Code and Run it

5.Make a Prototype

6.Test With The Created Code and check the designed prototype

7.Solution for the Problem is Found !!!


Project design and planning
Ideation phase
Project development phase
Sprint 1
Project design and planning
Project design phase - I
Project development phase
Sprint 2
Project design and planning
Project design phase - 2
Project development phase
Sprint 3
Project design and planning
Project planning phase
Project development phase
Sprint 4

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	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	5 Nov 2022
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-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov2022

CODING AND SOLUTIONING

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 Login
- Verification
- Ticket Booking
- Payment
- Ticket Cancellation
- Adding Queries

PROGRAMM:

```
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) 30
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() 31 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: ")32

s.sendmail('&&&&&&&&&&&',emailid,msg)

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

print("Verified")

else:

print("Please Check your OTP again")
```

TESTING

8.1. TEST CASES

SPRINT - 1

Testcase ID	Feature Type	Component	TestScenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Commnets	TC for Automation(Y/N)	BUG ID
2	UI	Generating OTP	Generating the OTP for further process				numbers, Gmail, Facebook or other social sites and to get oto number	Working as expected	pass			
3	Functional	OTP verification	Verify user otp using mail		1.Enter gmail id and enter password 2.click submit	Username: abc@gmail.com password: Testing123	OTP verified is to be displayed	Working as expected	pass			
4	Functional	Login page	Verify user is able to log into application with InValid credentials		1.Enter into log in page 2.Click on My Account dropdown button 3.Enter InValid username/email in Email text box 4.Enter valid password in password text box 5.Click on login button	Username: abc@gmail password: Testing123	Application should show 'Incorrect email or password ' validation message.	Working as expected	pass			
5	Functional	Display Train details	The user can view about the available train details		1.As a user, I can enter the start and destination to get the list of trains available connecting the above	Username: abc@gmail.com password: Testing1236786867868767876	A user can view about the available trains to enter start and destination details	Working as expected	fail			

SPRINT - 2

Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Commnets	TC for Automation(Y/N)	BUG ID
1	Functional	Booking	user can provide the basic details such as a name, age, gender etc		1.Enter method of reservation 2.Enter name,age,gender 3.Enter how many tickets wants to be booked 4.Also enter the number member's details like name,age,gender		Tickets booked to be displayed	Working as expected	Pass			
2	UI	Booking seats	User can choose the class, seat/berth. If a preferred seat/berth isn't available I can be allocated based on the		1.,known to which the seats are available		known to which the seats are available	Working as expected	pass			
3	Functional	Payment	user, I can choose to pay through credit Card/debit card/UPI.		1.user can choose payment method 2.pay using tht method		payment for the booked tickets to be done using payment method through either the following methods credit Card/debit	Working as expected	pass			
4	Functional	Redirection	user can be redirected to the selected		1.After payment the usre will be redirected to the previous page		After payment the usre will be redirected to the previous page	Working as expected	pass			

SPRINT - 3

Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Commnets	TC for Automation(Y/N)	BUG ID
			during my journey.		4.Also enter the number member's details like name,age,gender							
2	UI	Ticket status	a usercan see the status of my ticket Whether it's confirmed/waiting/RAC		1.known to the status of the tivkets booked		known to the status of the tivkets booked	Working as expected	pass			
3	Functional	Remainder notification	a user, I get remainders about my journey A day before my actual journey		1.user can get reminder nofication		user can get reminder nofication	Working as expected	pass			
4	Functional	GPS tracking	user can track the train using GPS and can get information such as ETA, Current stop and		1.tracking train for getting information		tracking process through GPS	Working as expected	pass			

SPRINT - 4

Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Commnets	TC for Automation(Y/N)	BUG ID
1	Functional	Ticket cancellatio	user can cancel my tickets there's any Change of plan		1.tickets to be cancelled		Tickets booked to be cancelled	Working as expected	Pass			
2	UI	Raise queries	user can raise queries through the query box or via mail.		1.raise the queries		raise the queries	Working as expected	pass			
3	Functional	Answer the queries	user will answer the questions/doubts Raised by the customers.		1.answer the queries		answer the queries	Working as expected	pass			
4	Functional	Feed details	a user will feed information about the trains delays and add extra seats if a new compartment is added.		1.information feeding on trains		information feeding on trains	Working as expected	pass			

RESULTS

9. RESULTS 9.1.

PERFORMANCE METRICS

ADVANTAGES&DISADVANTAGES

10. ADVANTAGES &DISADVANTAGES

10.1 ADVANTAGES

- Openness – compatibility between different system modules, potentially from different vendors;
- 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 both railway vehicles and infrastructure monitoring, using regular trains;
- Data processing, reduction, and analysis in local controllers, and subsequent sending of that data to the cloud, for further processing;
- Online data processing systems, for real-time monitoring, using emerging
- communication technologies;
- Integrated, interoperable, and scalable solutions for railway systems preventive maintenance.

CONCLUSION

11. CONCLUSION

Accidents occurring in Railway transportation system cost a large number of lives. So this system helps us to prevent accidents and giving information about faults or cracks in advance to railway authorities. So that they can fix them and accidents cases becomes less. This project is cost effective. By using more techniques they can be modified and developed according to their applications. By this system many lives can be saved by avoiding accidents. The idea can be implemented in large scale in the long run to facilitate better safety standards for rail tracks and provide effective testing infrastructure for achieving better results in the future.

FUTURESCOPE

12. FUTURE SCOPE

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 can also be used to show fault with the help of video. Locations on Google maps with the help of sensors can be used to detect in which area track is broken.

APPENDIX

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_required46 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() :48

# 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 >>: ")49 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)50

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="")51

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():52

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="+fro

m_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 string53 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 = []54 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
```

7.2. FEATURE 2

'

```
class User(AbstractBaseUser):
"""
User model.
"""
USERNAME_FIELD = "email"
REQUIRED_FIELDS = ["first_name", "last_name"]
email = models.EmailField( verbose_name="E-
mail", unique=True
)
first_name = models.CharField(
verbose_name="First name",
max_length=30
)
last_name = models.CharField(
verbose_name="Last name",
max_length=40
)
```

```
city = models.CharField(
verbose_name="City",
max_length=40
)
stripe_id = models.CharField(
verbose_name="Stripe ID",
unique=True,
max_length=50, blank=True,
null=True
)
objects = UserManager()
@property def
get_full_name(self):
return f"{self.first_name} {self.last_name}"
class Meta:
verbose_name = "User"
verbose_name_plural = "Users"
class Profile(models.Model):
```

"""

User's profile. """ phone_number =

models.CharField(

verbose_name="Phone number",

max_length=15

)57

date_of_birth = models.DateField(

verbose_name="Date of birth"

)

postal_code = models.CharField(

verbose_name="Postal code",

max_length=10, blank=True

)

address = models.CharField(

verbose_name="Address",

max_length=255, blank=True

)

class Meta: abstract =

True class

UserProfile(Profile):

"""

User's profile model.

""" user = models.OneToOneField(to=User,

on_delete=models.CASCADE, related_name="profile",

)58

group = models.CharField(

verbose_name="Group type",

choices=GroupTypeChoices.choices(),

max_length=20,

default=GroupTypeChoices.EMPLOYEE.name,

) def __str__(self):

return self.user.email

class Meta:

user 1 - employer user1, _ =

User.objects.get_or_create(

```
email="foo@bar.com",

first_name="Employer",

last_name="Testowy",

city="Białystok",

)

user1.set_unusable_password()

group_name = "employer"

_profile1, _ = UserProfile.objects.get_or_create(

user=user1, date_of_birth=datetime.now() -

timedelta(days=6600),

group=GroupTypeChoices(group_name).name,

address="Myśliwska 14", postal_code="15-569",59

phone_number="+48100200300",

)

# user2 - employee
user2, _ = User.objects.get_or_create()

email="bar@foo.com",

first_name="Employee",
```

```
last_name="Testowy",
city="Białystok",
)
user2.set_unusable_password()
group_name = "employee"
_profile2, _ = UserProfile.objects.get_or_create()
user=user2, date_of_birth=datetime.now() -
timedelta(days=7600),
group=GroupTypeChoices(group_name).name,
address="Myśliwska 14", postal_code="15-569",
phone_number="+48200300400",
)
response_customer = stripe.Customer.create()
email=user.email, description=f"EMPLOYER -
{user.get_full_name}", name=user.get_full_name,
phone=user.profile.phone_number,
)
user1.stripe_id = response_customer.stripe_id user1.save()
mcc_code, url = "1520", "https://www.softserveinc.com/"
```

```
response_ca = stripe.Account.create() type="custom",

country="PL", email=user2.email, default_currency="pln",

business_type="individual", settings={"payouts":

{"schedule": {"interval": "manual", }}},

requested_capabilities=["card_payments", "transfers", ],

business_profile={"mcc": mcc_code, "url": url},

individual={

"first_name": user2.first_name,

"last_name": user2.last_name,

"email": user2.email,
"dob": {

"day": user2.profile.date_of_birth.day,

"month": user2.profile.date_of_birth.month,

"year": user2.profile.date_of_birth.year,

},

"phone": user2.profile.phone_number,

"address": {

"city": user2.city,

"postal_code": user2.profile.postal_code,
```

"country": "PL",

"line1": user2.profile.address,61

},

},

)

user2.stripe_id = response_ca.stripe_id user2.save()

tos_acceptance = {"date": int(time.time()), "ip": user_ip},

stripe.Account.modify(user2.stripe_id,

tos_acceptance=tos_acceptance)

passport_front = stripe.File.create(

purpose="identity_document",

file=_file, # ContentFile object

stripe_account=user2.stripe_id,

)

individual = {

"verification": {

"document": {"front": passport_front.get("id"),},

"additional_document": {"front": passport_front.get("id"),},

} } stripe.Account.modify(user2.stripe_id, individual=individual)

new_card_source = stripe.Customer.create_source(user1.stripe_id,

source=token)$_{62}$ stripe.SetupIntent.create(

payment_method_types=["card"], customer=user1.stripe_id,

description="some description",

payment_method=new_card_source.id,

)

payment_method =

stripe.Customer.retrieve(user1.stripe_id).default_source

payment_intent = stripe.PaymentIntent.create(amount=amount,

currency="pln", payment_method_types=["card"],

capture_method="manual", customer=user1.stripe_id, #

customer payment_method=payment_method,

application_fee_amount=application_fee_amount,

transfer_data={"destination": user2.stripe_id}, # connect account

description=description, metadata=metadata,

)

payment_intent_confirm = stripe.PaymentIntent.confirm(

payment_intent.stripe_id, payment_method=payment_method

)

stripe.PaymentIntent.capture(

payment_intent.id,

amount_to_capture=amount

)63

stripe.Balance.retrieve(stripe_account=user2.stripe_id)

stripe.Charge.create(amount=amount,

currency="pln", source=user2.stripe_id,

description=description

)

stripe.PaymentIntent.cancel(payment_intent.id)

unique_together = ("user", "group")

@attr.s(frozen=True, cmp=False, hash=False, repr=True)

class UserSettings(MethodView):

form = attr.ib(factory=settings_form_factory)

settings_update_handler = attr.ib(factory=settings_update_handler)

decorators = [login_required] def get(self):

```
return self.render()

def post(self):

if self.form.validate_on_submit():

try:

self.settings_update_handler.apply_changeset(

current_user, self.form.as_change()

)

except StopValidation as e:64

self.form.populate_errors(e.reasons)

return self.render() except

PersistenceError:

logger.exception("Error while updating user settings")

flash(_("Error while updating user settings"), "danger")

return self.redirect() flash(_("Settings updated."),

"success") return self.redirect() return self.render() def

render(self): return

render_template("user/general_settings.html",

form=self.form) def redirect(self):

return redirect(url_for("user.settings"))
```

```
@attr.s(frozen=True, hash=False, cmp=False, repr=True)
class ChangePassword(MethodView):
form = attr.ib(factory=change_password_form_factory)
password_update_handler =
attr.ib(factory=password_update_handler) decorators =
[login_required] def get(self): return self.render() def
post(self):65 if self.form.validate_on_submit(): try:
self.password_update_handler.apply_changeset(
current_user, self.form.as_change()
)
except StopValidation as e:
self.form.populate_errors(e.reasons)
return self.render() except
PersistenceError:
logger.exception("Error while
changing password") flash(_("Error
while changing password"),
"danger") return self.redirect()
flash(_("Password updated."),
```

"success") return self.redirect()

return self.render() def render(self):

return

render_template("user/change_pass

word.html", form=self.form) def

redirect(self):

return redirect(url_for("user.change_password"))

@attr.s(frozen=True, cmp=False, hash=False, repr=True)

class ChangeEmail(MethodView):

form = attr.ib(factory=change_email_form_factory)

update_email_handler = attr.ib(factory=email_update_handler)

decorators = [login_required]66 def get(self):

return self.render()

def post(self):

if self.form.validate_on_submit():

try:

self.update_email_handler.apply_changeset(

current_user, self.form.as_change()

)

except StopValidation as e:

self.form.populate_errors(e.reasons)

return self.render() except

PersistenceError:

logger.exception("Error while updating email")

flash(_("Error while updating email"), "danger")

return self.redirect() flash(_("Email address

updated."), "success") return self.redirect()

return self.render() def render(self):

return render_template("user/change_email.html", form=self.form)

def redirect(self):

return redirect(url_for("user.change_email"))
def berth_type(s):

if s>0 and s<73:67

if s % 8 == 1 or s % 8 == 4:

print (s), "is lower berth"

elif s % 8 == 2 or s % 8 == 5:

print (s), "is middle berth"

elif s % 8 == 3 or s % 8 == 6:

```
print (s), "is upper berth"

elif s % 8 == 7:

print (s), "is side lower berth"

else: print (s), "is side upper

berth" else:

print (s), "invalid seat number"

# Driver code

s = 10

berth_type(s) # fxn call for berth type

s = 7

berth_type(s) # fxn call for berth type s = 0

berth_type(s) # fxn call for berth type class Ticket:

counter=0 def

__init__(self,passenger_name,source,destination):

self.__passenger_name=passenger_name

self.__source=source

self.__destination=destination

self.Counter=Ticket.counter
```

Ticket.counter+=1[68] def

validate_source_destination(self):

if (self.__source=="Delhi" and (self.__destination=="Pune" or

self.__destination=="Mumbai" or self.__destination=="Chennai"

or self.__destination=="Kolkata")):

return True

else:

return False def

generate_ticket(self): if

True:

__ticket_id=self.__source[0]+self.__destination[0]+"0"+str(self.C

ounter) print("Ticket id will be:",__ticket_id) else:

return False def

get_ticket_id(self): return

self.ticket_id def

get_passenger_name(self):

return self.__passenger_name

def get_source(self): if

self.__source=="Delhi":

return self.__source

else:

print("you have written invalid soure option")

return None def get_destination(self): if

self.__destination=="Pune":

return self.__destination

```
elif self.__destination=="Mumbai":

return self.__destination69 elif

self.__destination=="Chennai":

return self.__destination elif

self.__destination=="Kolkata":

return self.__destination

else:

return None

# user define function

# Scrape the data

def getdata(url): r = requests.get(url) return r.text # input by geek

train_name = "03391-rajgir-new-delhi-clone-special-rgd-to-ndls"

# url url = "https://www.railyatri.in/live-train-

status/"+train_name

# pass the url into

  getdata function

  htmldata =

  getdata(url) soup =

#
```

```
   BeautifulSoup(html

   data, 'html.parser')

# traverse the live status from # this Html code data = [] for

item in soup.find_all('script', type="application/ld+json"):

data.append(item.get_text())70

# convert into dataframe df =

pd.read_json(data[2])

# display this column of # dataframe

print(df["mainEntity"][0]['name'])

print(df["mainEntity"][0]['acceptedAnswer']['text'])

Speak method def Speak(self, audio):

# Calling the initial constructor

# of pyttsx3 engine =

pyttsx3.init('sapi5')

   Calling the getter method
voices = engine.getProperty('voices') #

Calling the setter method

engine.setProperty('voice', voices[1].id)

#
```

```
engine.say(audio)

engine.runAndWait() def

Take_break(): Speak("Do you want to

start sir?") question = input() if "yes" in

question:71 Speak("Starting Sir") if "no"

in question:

Speak("We will automatically start after 5 Mins

Sir.")

time.sleep(5*60)

Speak("Starting Sir")

# A notification we will held that

# Let's Start sir and with a message of

# will tell you to take a break after 45

  mins for 10 seconds









#
```

```
while(True):

notification.notify(title="Let's Start sir",

message="will tell you to take a break after 45

mins", timeout=10)

# For 45 min the will be no notification but

# after 45 min a notification will pop up.

time.sleep(0.5*60) Speak("Please Take a break

Sir") notification.notify(title="Break Notification",

message="Please do use your device after

sometime as you have"

"been continuously using it for 45 mins and it will

affect your eyes", timeout=10)72 # Driver's Code

if __name__ == '__main__': Take_break()

data_path = 'data.csv'

data = pd.read_csv(data_path, names=['LATITUDE',
'LONGITUDE'],

sep=',') gps_data =

tuple(zip(data['LATITUDE'].values,
```

data['LONGITUDE'].values)) image =

Image.open('map.png', 'r') # Load map image.

img_points = []

for d in gps_data:

x1, y1 = scale_to_img(d, (image.size[0], image.size[1])) # Convert GPS

coordinates to image coordinates. img_points.append((x1, y1))

draw = ImageDraw.Draw(image) draw.line(img_points, fill=(255,

0, 0), width=2) # Draw converted records to the map image.

image.save('resultMap.png') x_ticks = map(lambda x: round(x, 4),

np.linspace(lon1, lon2, num=7)) y_ticks = map(lambda x:

round(x, 4), np.linspace(lat1, lat2, num=8))

y_ticks = sorted(y_ticks, reverse=True) # y ticks must be reversed due to conversion to image coordinates.

fig, axis1 = plt.subplots(figsize=(10, 10))

axis1.imshow(plt.imread('resultMap.png')) # Load the image to

matplotlib plot.

axis1.set_xlabel('Longitude')[73]

axis1.set_ylabel('Latitude')

axis1.set_xticklabels(x_ticks)

axis1.set_yticklabels(y_ticks)

axis1.grid() plt.show() class

tickets: def __init__(self):

self.no_ofac1stclass=0

self.totaf=0

self.no_ofac2ndclass=0

self.no_ofac3rdclass=0

self.no_ofsleeper=0

```
self.no_oftickets=0

self.name="

self.age="

self.resno=0

self.status=" def

ret(self):

return(self.resno)

def retname(self):

return(self.name)

def display(self):

f=0

fin1=open("tickets.dat","rb")

if not fin1: print "ERROR"

else:

print

n=int(raw_input("ENTER PNR NUMBER : "))

print "\n\n"74




print
```

```
        ("FETCHING DATA . . .".center(80))
          time.sleep(1) print print('PLEASE
         WAIT...!!'.center(80)) time.sleep(1)
                  os.system('cls') try:
while True: tick=load(fin1)
if(n==tick.ret()): f=1 print "="*80
print("PNR STATUS".center(80))
print"="*80 print
print "PASSENGER'S NAME :",tick.name
print
print "PASSENGER'S AGE :",tick.age
print print "PNR NO
:",tick.resno print print
"STATUS :",tick.status
print
print "NO OF SEATS BOOKED : ",tick.no_oftickets
print
except:
pass
```

```
fin1.close()

if(f==0):

print75

print "WRONG PNR NUMBER..!!"

print def

pending(self):

self.status="WAITING LIST"

print "PNR NUMBER :",self.resno

print time.sleep(1.2) print

"STATUS = ",self.status

print
```

```
print
        "NO OF SEATS BOOKED : ",self.no_oftickets
print def confirmation (self):
self.status="CONFIRMED" print
"PNR NUMBER : ",self.resno
print time.sleep(1.5) print
"STATUS = ",self.status
print def
cancellation(self):
z=0 f=0
fin=open("tickets.dat","rb")
fout=open("temp.dat","ab")
print
r= int(raw_input("ENTER PNR NUMBER : "))
try:
while(True):
tick=load(fin)
z=tick.ret()
if(z!=r):
```

```
dump(tick,fout)
elif(z==r): f=1
except: pass
fin.close()
fout.close()
os.remove("tick
ets.dat")
os.rename("tem
p.dat","tickets.d
at") if (f==0):
print
print "NO SUCH RESERVATION NUMBER FOUND"
print
time.sleep(2)
os.system('cls')
else:
        "TICKET CANCELLED"
print"RS.600 REFUNDED...."
def reservation(self):

print
```

```
print

trainno=int(raw_input("ENTER THE TRAIN NO:"))

z=0 f=0 fin2=open("tr1details.dat") fin2.seek(0) if

not fin2: print "ERROR"

else:

try:

while True:77

tr=load(fin2)

z=tr.gettrainno()

n=tr.gettrainname()

if (trainno==z):


        "TRAIN NAME IS : ",n









print

print
```

```
f=1

print print "-"*80

no_ofac1st=tr.getno_ofac1stclass()

no_ofac2nd=tr.getno_ofac2ndclass()

no_ofac3rd=tr.getno_ofac3rdclass()

no_ofsleeper=tr.getno_ofsleeper()

if(f==1):

fout1=open("tickets.dat","ab") print

self.name=raw_input("ENTER THE PASSENGER'S

NAME ")

print

self.age=int(raw_input("PASSENGER'S AGE : "))

print

print"\t\t SELECT A CLASS YOU WOULD LIKE TO

TRAVEL IN :- "

        "1.AC FIRST CLASS"
        "2.AC SECOND CLASS"

print


print

print
```

```
print

print "3.AC THIRD CLASS"

print

print "4.SLEEPER CLASS"78

print

c=int(raw_input("\t\t\tENTER YOUR CHOICE = "))

os.system('cls')

amt1=0

if(c==1):

self.no_oftickets=int(raw_input("ENTER NO_OF

FIRST CLASS AC SEATS TO BE BOOKED : "))

i=1

while(i<=self.no_oftickets):

self.totaf=self.totaf+1

amt1=1000*self.no_oftickets

i=i+1


        "PROCESSING. .",


print

print
```

```
time.sleep(0.5)

print ".",

time.sleep(0.3)

print'.'

time.sleep(2)

os.system('cls')

print "TOTAL AMOUNT TO BE PAID = ",amt1

self.resno=int(random.randint(1000,2546))

x=no_ofac1st-self.totaf print if(x>0):

self.confirmation()

dump(self,fout1)

break

else:

self.pending()

dump(tick,fout1)

break elif(c==2):
```

```
self.no_oftickets=int(raw_input("ENTER NO_OF

SECOND CLASS AC SEATS TO BE BOOKED : "))

i=1 def

menu():

tr=train()

tick=tickets()

print

print "WELCOME TO PRAHIT AGENCY".center(80)

while True:

print print "="*80 print "

\t\t\t\t RAILWAY"

print print

"="*80 print

print "\t\t\t1. **UPDATE TRAIN DETAILS."

print

print "\t\t\t2. TRAIN DETAILS. "
print "\t\t\t3. RESERVATION OF TICKETS."

print

print "\t\t\t4. CANCELLATION OF TICKETS. "


print
```

```
print

print "\t\t\t5. DISPLAY PNR STATUS."80

print print "\t\t\t6. QUIT." print"** - office use....."

ch=int(raw_input("\t\t\tENTER YOUR CHOICE : "))

os.system('cls')

print

"\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\t\t\t\t\t\tLO
ADI

NG. .",

time.sleep(1)

print ("."),

time.sleep(0.5)

print (".")

time.sleep(2)

os.system('cls') if

ch==1:

j="*****"

r=raw_input("\n\

n\n\n\n\n\n\n\n\

```

```
n\t\t\t\tENTER

THE

PASSWORD: ")

os.system('cls') if

(j==r): x='y' while

(x.lower()=='y'):

fout=open("tr1details.dat","ab") tr.getinput()

dump(tr,fout) fout.close()

print"\n\n\n\n\n\n\n\n\n\n\n\t\t\tUPDATING TRAIN LIST

PLEASE WAIT . .",

time.sleep(1)

print ("."),81

time.sleep(0.5)

        ("."),
time.sleep(2) os.system('cls')

print "\n\n\n\n\n\n\n\n\n\n\n"

x=raw_input("\t\tDO YOU WANT TO ADD ANY MORE

TRAINS DETAILS ? ")



print
```

```
os.system('cls')

continue

elif(j<>r):

print"\n\n\n\n\n"

print "WRONG PASSWORD".center(80)

elif ch==2:

fin=open("tr1details.dat",'rb')

if not fin: print "ERROR"

else:

try:

while True: print"*"*80

print"\t\t\t\tTRAIN DETAILS"

print"*"*80 print tr=load(fin)

tr.output()

raw_input("PRESS ENTER TO VIEW NEXT TRAIN

DETAILS")82

os.system('cls')

except EOFError:
```

```
pass elif

ch==3:

print'='*80

print "\t\t\t\tRESERVATION OF TICKETS"

print'='*80 print tick.reservation() elif ch==4:

print"="*80 print"\t\t\t\tCANCELLATION

OF TICKETS" print"="*80 print

tick.cancellation() elif ch==5: print "="*80

print("PNR STATUS".center(80))

print"="*80 printclass tickets: def

__init__(self): self.no_ofac1stclass=0

self.totaf=0 self.no_ofac2ndclass=0

self.no_ofac3rdclass=0 self.no_ofsleeper=0

self.no_oftickets=0 self.name=" self.age="

self.resno=0 self.status="

print
```

```
def ret(self):

return(self.resno)

def retname(self):

return(self.name)

def display(self):

f=0

fin1=open("tickets.dat","rb")

if not fin1: print "ERROR"

else:

print

n=int(raw_input("ENTER PNR NUMBER : "))

print "\n\n" print ("FETCHING DATA . .

.".center(80))

time.sleep(1) print print('PLEASE

WAIT...!!'.center(80)) time.sleep(1)

os.system('cls')

try:

while True: tick=load(fin1)

if(n==tick.ret()): f=1 print "="*80
```

```
print("PNR STATUS".center(80))

print"="*80 print84

print "PASSENGER'S NAME :",tick.name

print

print "PASSENGER'S AGE :",tick.age

print print "PNR NO

:",tick.resno

print print "STATUS

:",tick.status print

print "NO OF SEATS BOOKED : ",tick.no_oftickets

print
except:

pass

fin1.close()

if(f==0):

print

print "WRONG PNR NUMBER..!!"

print def

pending(self):
```

```
self.status="WAITING LIST"

print "PNR NUMBER :",self.resno

print time.sleep(1.2) print

"STATUS = ",self.status

print

print "NO OF SEATS BOOKED : ",self.no_oftickets

print def confirmation (self):

self.status="CONFIRMED" print

"PNR NUMBER : ",self.resno

print85 time.sleep(1.5) print

"STATUS = ",self.status

print def

cancellation(self):

z=0 f=0

fin=open("tickets.dat","rb")

fout=open("temp.dat","ab")

print

r= int(raw_input("ENTER PNR NUMBER : "))
```

```
try:
while(True):
tick=load(fin)
z=tick.ret()
if(z!=r):
dump(tick,fout)
elif(z==r): f=1
except: pass fin.close() fout.close()
os.remove("tickets.dat")
os.rename("temp.dat","tickets.dat")
if (f==0): print
print "NO SUCH RESERVATION NUMBER FOUND"
print
time.sleep(2)
os.system('cls')
```

```
else: print
print "TICKET CANCELLED"
print"RS.600 REFUNDED...."
def reservation(self):
```

```
trainno=int(raw_input("ENTER THE TRAIN NO:"))

z=0

f=0

fin2=open("tr1details.dat")

fin2.seek(0) if not fin2:

print "ERROR"

else:

try:

while True:

tr=load(fin2)

z=tr.gettrainno()

n=tr.gettrainname()

if (trainno==z):

print

print "TRAIN NAME IS : ",n

f=1

print print "-"*80

no_ofac1st=tr.getno_ofac1stclass()

no_ofac2nd=tr.getno_ofac2ndclass()
```

```
no_ofac3rd=tr.getno_ofac3rdclass()

no_ofsleeper=tr.getno_ofsleeper()

if(f==1):

fout1=open("tickets.dat","ab")87

print

self.name=raw_input("ENTER THE PASSENGER'S

NAME ")

print

self.age=int(raw_input("PASSENGER'S AGE : "))

print

print"\t\t SELECT A CLASS YOU WOULD LIKE TO

TRAVEL IN :- " print "1.AC FIRST CLASS"

print

print "2.AC SECOND CLASS"

print

print "3.AC THIRD CLASS"

print

print "4.SLEEPER CLASS"
print
```

```
c=int(raw_input("\t\t\tENTER YOUR CHOICE = "))

os.system('cls')

amt1=0

if(c==1):

self.no_oftickets=int(raw_input("ENTER NO_OF

FIRST CLASS AC SEATS TO BE BOOKED : "))

i=1

while(i<=self.no_oftickets):

self.totaf=self.totaf+1

amt1=1000*self.no_oftickets

i=i+1 print

print "PROCESSING. .",

time.sleep(0.5)88

print ".",

time.sleep(0.3)

print'.'

time.sleep(2)
os.system('cls')

print "TOTAL AMOUNT TO BE PAID = ",amt1
```

```
self.resno=int(random.randint(1000,2546))

x=no_ofac1st-self.totaf print if(x>0):

self.confirmation()

dump(self,fout1)

break

else:

self.pending()

dump(tick,fout1)

break elif(c==2):

self.no_oftickets=int(raw_input("ENTER NO_OF

SECOND CLASS AC SEATS TO BE BOOKED : "))

i=1 def

menu():

tr=train()
tick=tickets()

print

print "WELCOME TO PRAHIT AGENCY".center(80)
```

```
while True:89 print print

"="*80 print " \t\t\t\t

RAILWAY"

print print

"="*80 print

print "\t\t\t1. **UPDATE TRAIN DETAILS."

print

print "\t\t\t2. TRAIN DETAILS. "

print

print "\t\t\t3. RESERVATION OF TICKETS."

print

print "\t\t\t4. CANCELLATION OF TICKETS. "

print

print "\t\t\t5. DISPLAY PNR STATUS."
print print "\t\t\t6. QUIT." print"** - office use....."

ch=int(raw_input("\t\t\tENTER YOUR CHOICE : "))

os.system('cls')

print

"\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\n\t\t\t\t\t\tLO
ADI
```

```
NG. .", time.sleep(1) print ("."), time.sleep(0.5) print

("."") time.sleep(2) os.system('cls') if ch==1:90

j="*****"

r=raw_input("\n\n\n\n\n\n\n\n\n\n\n\t\t\t\tENTER THE

PASSWORD: ")
os.system('cls') if

(j==r): x='y' while

(x.lower()=='y'):

fout=open("tr1details.dat","ab") tr.getinput()

dump(tr,fout) fout.close()

print"\n\n\n\n\n\n\n\n\n\n\n\t\t\tUPDATING TRAIN LIST

PLEASE WAIT . .",

time.sleep(1) print ("."),

time.sleep(0.5) print ("."),

time.sleep(2)

os.system('cls') print

"\n\n\n\n\n\n\n\n\n\n\n"

x=raw_input("\t\tDO YOU WANT TO ADD ANY MORE

TRAINS DETAILS ? ")
```

```
os.system('cls')

continue

elif(j<>r):

print"\n\n\n\n\n"

print "WRONG PASSWORD".center(80)

elif ch==2:

fin=open("tr1details.dat",'rb')

if not fin:91

print "ERROR"

tick.display()

elif ch==6:

quit()

raw_input("PRESS ENTER TO GO TO BACK

MENU".center(80))

os.system('cls')

menu() sender_email = "my@gmail.com" receiver_email

= "your@gmail.com" password = input("Type your

password and press enter:") message =

MIMEMultipart("alternative") message["Subject"] =
```

```
"multipart test" message["From"] = sender_email

message["To"] = receiver_email

# Create the plain-text and HTML version of your message

text = """\

Hi,

How are you?

Real Python has many great tutorials:

www.realpython.com"""

html = """\ <html>

<body>

<p>Hi,<br>

How are you?<br>92

<a href="http://www.realpython.com">Real Python</a>

has many great tutorials.

</p>

</body>
</html>

"""
```

```
# Turn these into plain/html MIMEText objects

part1 = MIMEText(text, "plain") part2 =

MIMEText(html, "html")

# Add HTML/plain-text parts to MIMEMultipart message

# The email client will try to render the last part first

message.attach(part1) message.attach(part2)

# Create secure connection with server and send email context =

ssl.create_default_context() with

smtplib.SMTP_SSL("smtp.gmail.com", 465, context=context) as

server:

server.login(sender_email, password)

server.sendmail( sender_email, receiver_email,

message.as_string()

)

subject = "An email with attachment from Python"
body = "This is an email with attachment sent from Python"

sender_email = "my@gmail.com" receiver_email =

"your@gmail.com" password = input("Type your password

and press enter:")93 # Create a multipart message and set

headers message = MIMEMultipart() message["From"] =
```

```
sender_email message["To"] = receiver_email
message["Subject"] = subject message["Bcc"] =
receiver_email # Recommended for mass emails
# Add body to email
message.attach(MIMEText(body, "plain")) filename =
"document.pdf" # In same directory as script
# Open PDF file in binary mode with
open(filename, "rb") as attachment:
# Add file as application/octet-stream
# Email client can usually download this automatically as
attachment part = MIMEBase("application", "octet-
stream") part.set_payload(attachment.read())

# Encode file in ASCII characters to send by email
encoders.encode_base64(part)
# Add header as key/value pair to attachment part
part.add_header( "Content-Disposition",
f"attachment; filename= {filename}",
)
# Add attachment to message and convert message to string
```

message.attach(part)94

text = message.as_string()

Log in to server using secure context and send email context =

ssl.create_default_context() with

smtplib.SMTP_SSL("smtp.gmail.com", 465, context=context) as

server:

server.login(sender_email, password)

server.sendmail(sender_email, receiver_email, text)

api_key = "Your_API_key"

```
#
   base_url variable to store url base_url =

"https://api.railwayapi.com/v2/pnr-status/pnr/"

# Enter valid pnr_number pnr_number = "6515483790" # Stores

complete url address complete_url = base_url + pnr_number +

"/apikey/" + api_key +

"/"

# get method of requests module # return

response object response_ob =

requests.get(complete_url) # json method

of response object convert # json format

data into python format data result =

response_ob.json() # now result contains

list # of nested dictionaries if

result["response_code"] == 200:95 # train

name is extracting # from the result

variable data train_name =

result["train"]["name"]
```

```
#
   train number is extracting from # the

result variable data train_number =

result["train"]["number"]

# from station name is extracting # from the

result variable data from_station =

result["from_station"]["name"]

# to_station name is extracting from # the result

variable data to_station =

result["to_station"]["name"] # boarding point

station name is # extracting from the result variable

data boarding_point =

result["boarding_point"]["name"]

# reservation upto station name is #

extracting from the result variable data

reservation_upto =

result["reservation_upto"]["name"]
```

```
#
# store the value or data of "pnr"
# key in pnr_num variable
pnr_num = result["pnr"]96
   store the value or data of "doj" key # in
variable date_of_journey variable
date_of_journey = result["doj"] # store the
value or data of # "total_passengers" key in
variable total_passengers =
result["total_passengers"]
# store the value or data of "passengers"
# key in variable passengers_list
passengers_list = result["passengers"] #
store the value or data of #
"chart_prepared" key in variable
chart_prepared = result["chart_prepared"]
# print following values print(" train
name : " + str(train_name)
+ "\n train number : " + str(train_number)
```

```
#
+ "\n from station : " + str(from_station)

+ "\n to station : " + str(to_station)

+ "\n boarding point : " + str(boarding_point)

+ "\n reservation upto : " + str(reservation_upto)
```

```
+ "\n pnr number : " + str(pnr_num)
+ "\n date of journey : " + str(date_of_journey)
+ "\n total no. of passengers: " +
str(total_passengers)
+ "\n chart prepared : " + str(chart_prepared))
# looping through passenger list97 for
passenger in passengers_list: # store the
value or data # of "no" key in variable
passenger_num = passenger["no"] # store the
value or data of # "current_status" key in
variable current_status =
passenger["current_status"]
# store the value or data of # "booking_status"
key in variable booking_status =
passenger["booking_status"]
# print following values print(" passenger number
: " + str(passenger_num)
+ "\n current status : " + str(current_status)
```

```
+ "\n booking_status : " + str(booking_status))

else: print("Record Not Found")
```

13.2 GITHUB LINK

https://github.com/IBM-EPBL/IBM-Project-51969-1660987521

THANK YOU