Smart Solutions For Railways

A Project Report

Submitted by

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1. INTRODUCTION

1.1 PROJECT OVERVIEW:

A smart railway station is a station area that uses different types of electronic Internet of things (IOT) sensors to collect data and use that data to better improve efficiency, mobility and sustainability. It mainly includes. smart management, smart infrastructure, and smart mobility. Railways have been an essential mode of transportation to people all over the world for centuries. They were critical to the industrial revolution and played a major role in creating thriving, innovative societies. Today, railways are more important than ever as country and city governments are being asked to find innovative ways to safely get back to business post-COVID, meet the changing needs of their citizens, address urban population increases, and reduce their environmental impact.

To meet these challenges and position themselves for future success, many forward-thinking governments and railway operators are looking for smart, intelligent IoT technologies to modernize their railways.

1.2 PURPOSE:

Its application increases safety, efficiency and ease of use with train management systems. Control and surveillance systems reduce the risk of collisions and regulate speed. Advanced consumer technologies help maximize connectivity and allow passengers to continue their activities on smart devices while traveling. Rail transport (also known as train transport) is a means of transport that transfers passengers and goods on wheeled vehicles running on rails, which are incorporated in tracks.

The Corporate aim of the Indian Railways is to commit itself to ensuring that all its activities are managed to the highest level of safety which is pragmatic and reasonably practicable to achieve. In terms of the economy, railways played a major role in integrating markets and increasing trade. In terms of politics, railways shaped the finances of the colonial government and the Princely States.

2. LITERATURE SURVEY

2.1 EXISTING PROBLEM:

The Internet of Things seems to be created for use in the Railways; even the acronym "IoT"
might be decrypted as the Internet of Trains. Really, IoT sensors measuring speed, vibration,
telemetry, brakes, and more have made it much easier to monitor the schedule, detect route
issues, and eliminate human mistakes while operating a train.
Smart railway is a technologically advanced approach to efficiently manage railway operations
through sharing of rail data across rail infrastructure components, such as passengers, control
centers, ticketing department, and freight.

2.2 REFERENCES:

- Internet of Things for Smart Railway: Feasibility and Applications

Author: Ohyun Jo, Graduate Student Member, IEEE, Yong-Kyu Kim, Member, IEEE, and Juyeop Kim, Member, IEEE 2018

- Internet of Things in the Railway Domain: Edge Sensing System Based on Solid-State LIDAR and Fuzzy Clustering for Virtual Coupling

Author: GABRIEL MUJICA , (Member, IEEE), JAVIER HENCHE, AND JORGE PORTILLA , (Senior Member, IEEE)

- Robust Railway Crack Detection Scheme (RRCDS) Using LED-LDR Assembly 2012 Internet of things

Author: Gourav saha, vaidehi,vigneshwar murali

- Review on railway track crack detection using IR transmitter and receiver

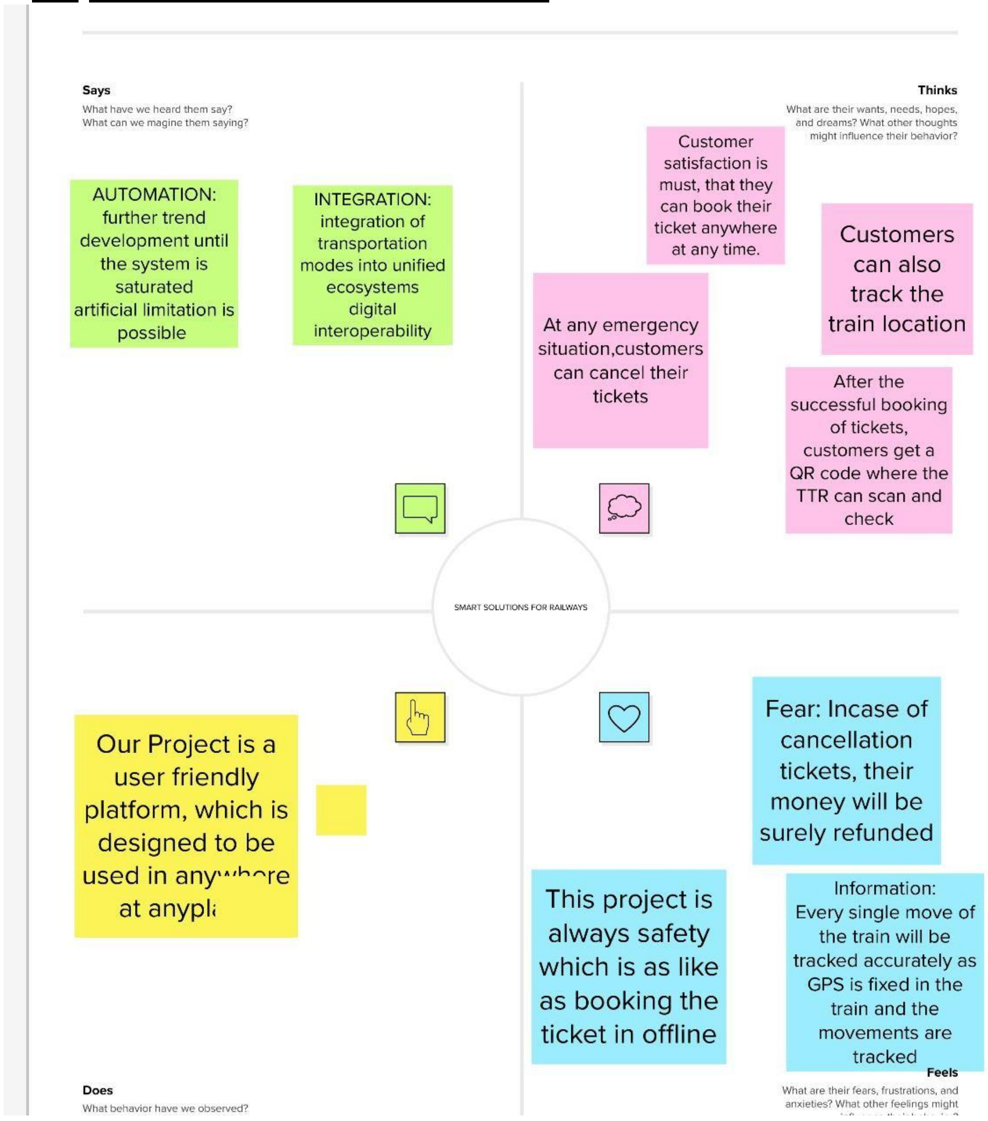
Author: Rakesh V. Pise1, Parag D. Nikhar2, Prof. Avinash H.Shelar

2.3 PROBLEM STATEMENT DEFINITION:

- We don’t need to spend time in entering into application directly
- we can use QR scanner.
- It improves encryption to avoid misleading of data.
- Automatic gate systems can be employed.
- Track fault and barrier object detection can save many lives.

3.IDEATION AND PROPOSED SOLUTION

3.1 EMPATHY MAP CANVAS:


Says
What have we heard them say?
What can we magine them saying?
Thinks
What are their wants, needs, hopes, and dreams? What other thoughts might influence their behavior?
SMART SOLUTIONS FOR RAILWAYS
Does
What behavior have we observed?
Feels
What are their fears, frustrations, and anxieties? What other feelings might

AUTOMATION: further trend development until the system is saturated artificial limitation is possible

INTEGRATION: integration of transportation modes into unified ecosystems digital interoperability

Customer satisfaction is must, that they can book their ticket anywhere at any time.

Customers can also track the train location

At any emergency situation,customers can cancel their tickets

After the successful booking of tickets, customers get a QR code where the TTR can scan and check

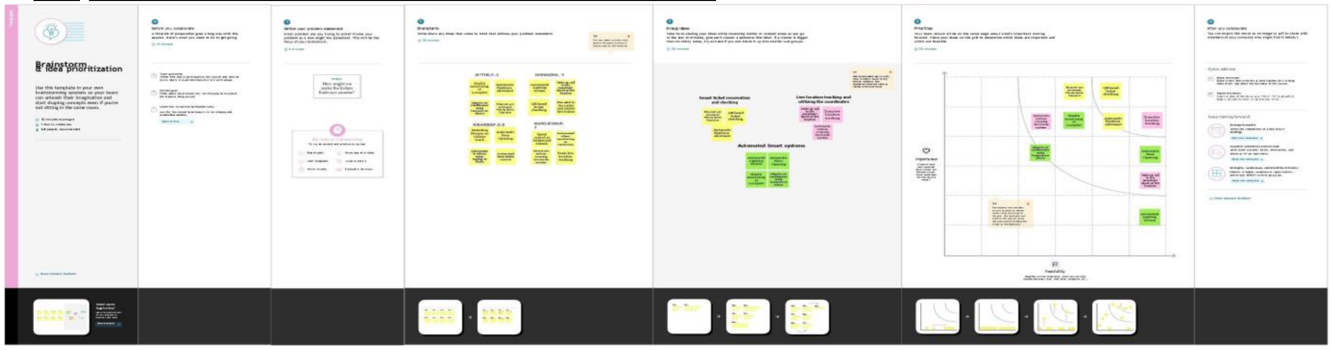
Our Project is a user friendly platform, which is designed to be used in anywhere at anypl

Fear: Incase of cancellation tickets, their money will be surely refunded

This project is always safety which is as like as booking the ticket in offline

Information: Every single move of the train will be tracked accurately as GPS is fixed in the train and the movements are tracked

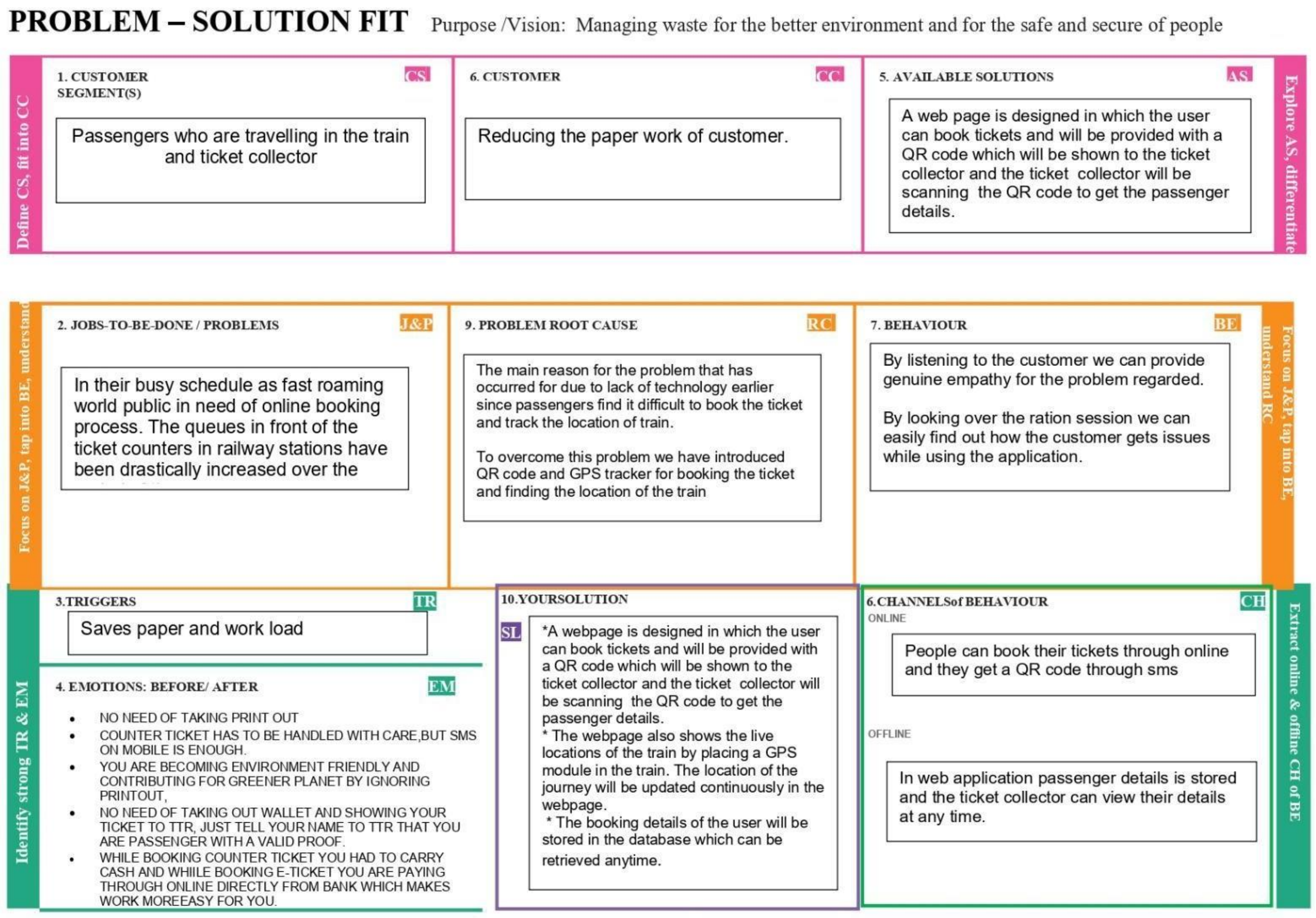
3.2 IDEATION AND BRAINSTORMING:



3.3 PROPOSED SOLUTION:

S.No.	**Parameter**	**Description**
1.	Problem Statement (Problem to be solved)	Smart Solutions for railways is designed to reduced the work load of the user and also the use of paper.
2.	Idea / Solution description	Smart sensors can be used to track important assets, manage passenger flow, and enable predictive maintenance.
3.	Novelty / Uniqueness	Usage of QR code
4.	Social Impact / Customer Satisfaction	Avoid last time traffic, Improved efficiency
5.	Business Model (Revenue Model)	Yes, As it is the affordable device we can able to implement to the many network.
6.	Scalability of the Solution	By this proposed solution we can avoid rail line crossing deaths ,monitor railfriction , detect obstacles and track maintenance.

3.4 PROBLEM SOLUTION FIT:



PROBLEM – SOLUTION FIT Purpose /Vision: Managing waste for the better environment and for the safe and secure of people

Define CS, fit into CC

1. CUSTOMER SEGMENT(S) CS

Passengers who are travelling in the train and ticket collector

6. CUSTOMER CC

Reducing the paper work of customer.

5. AVAILABLE SOLUTIONS AS

A web page is designed in which the user can book tickets and will be provided with a QR code which will be shown to the ticket collector and the ticket collector will be scanning the QR code to get the passenger details.

Explore AS, differentiate

Focus on J&P, tap into BE, understand

2. JOBS-TO-BE-DONE / PROBLEMS J&P

In their busy schedule as fast roaming world public in need of online booking process. The queues in front of the ticket counters in railway stations have been drastically increased over the

9. PROBLEM ROOT CAUSE RC

The main reason for the problem that has occurred for due to lack of technology earlier since passengers find it difficult to book the ticket and track the location of train.

To overcome this problem we have introduced QR code and GPS tracker for booking the ticket and finding the location of the train

7. BEHAVIOUR BE

By listening to the customer we can provide genuine empathy for the problem regarded.

By looking over the ration session we can easily find out how the customer gets issues while using the application.

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

Identify strong TR & EM

3.TRIGGERS TR

Saves paper and work load

4. EMOTIONS: BEFORE/ AFTER EM

- NO NEED OF TAKING PRINT OUT
- COUNTER TICKET HAS TO BE HANDLED WITH CARE,BUT SMS ON MOBILE IS ENOUGH.
- YOU ARE BECOMING ENVIRONMENT FRIENDLY AND CONTRIBUTING FOR GREENER PLANET BY IGNORING PRINTOUT,
- NO NEED OF TAKING OUT WALLET AND SHOWING YOUR TICKET TO TTR, JUST TELL YOUR NAME TO TTR THAT YOU ARE PASSENGER WITH A VALID PROOF.
- WHILE BOOKING COUNTER TICKET YOU HAD TO CARRY CASH AND WHIILE BOOKING E-TICKET YOU ARE PAYING THROUGH ONLINE DIRECTLY FROM BANK WHICH MAKES WORK MOREEASY FOR YOU.

10.YOURSOLUTION SL

*A webpage is designed in which the user can book tickets and will be provided with a QR code which will be shown to the ticket collector and the ticket collector will be scanning the QR code to get the passenger details.
* The webpage also shows the live locations of the train by placing a GPS module in the train. The location of the journey will be updated continuously in the webpage.
* The booking details of the user will be stored in the database which can be retrieved anytime.

6.CHANNELSof BEHAVIOUR CH

ONLINE

People can book their tickets through online and they get a QR code through sms

OFFLINE

In web application passenger details is stored and the ticket collector can view their details at any time.

Extract online & offline CH of BE

4. REQUIREMENT ANALYSIS

4.1 FUNCTIONAL REQUIREMENT:

FR No.	Functional Requirement(Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Passenger ticket booking	Booking through the online railway mobile app and website.
FR-2	Booking Confirmation	Booking Confirmation via EmailBooking Confirmation via SMS
FR-3	Passenger objections and feedback	Through the online application, SMS, and email to the respective authority.
FR-4	Passenger schedule	Passenger can see their train timing through the mobile app
FR-5	Passenger Emergency	Passengers in an Emergency, in case of accidents, natural disasters, or theft duringthe journey can complain through online applications, emergency calls, SMS, and email.

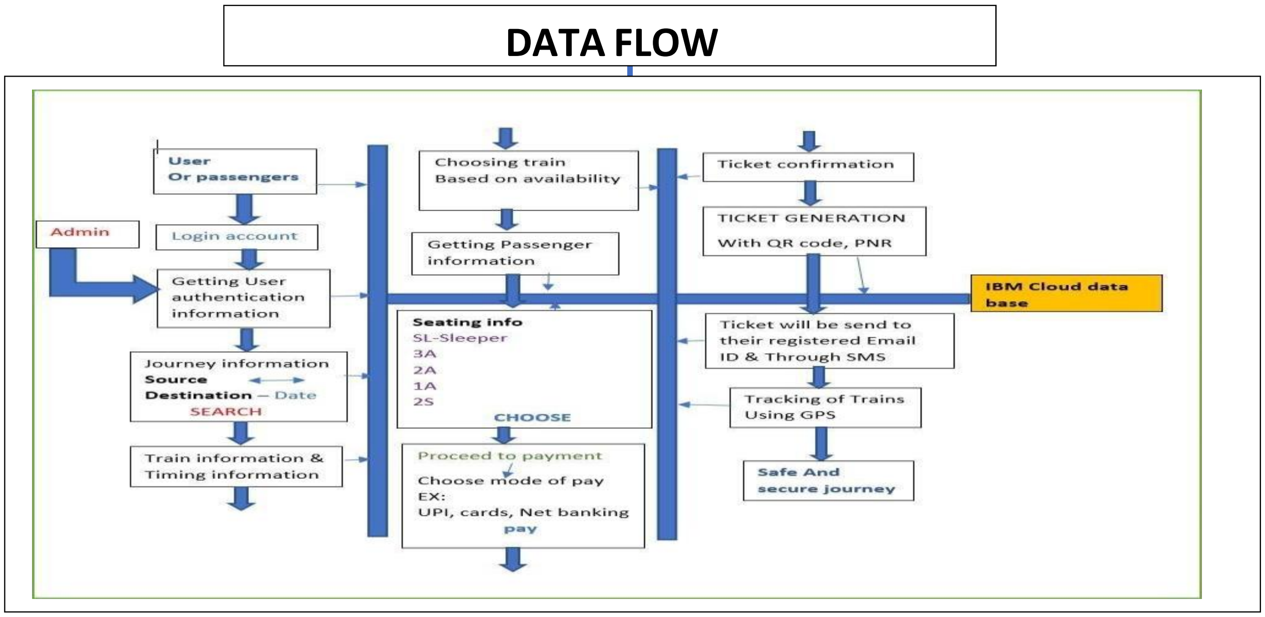
4.2 NON-FUNCTIONAL REQUIREMENT:

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Within periodic maintenance, we can detect cracks in the railway track. which will be highly usable on remote railway tracks.

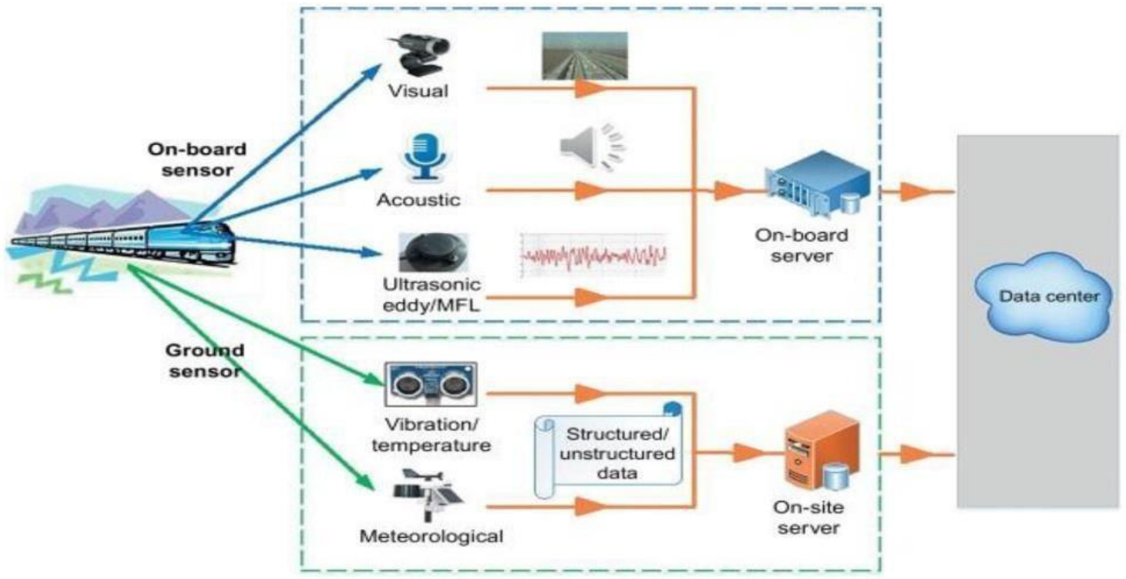
NFR-2	**Security**	Accidents and property damage can be prevented with the help of our smart sensors which immediately send the fault to the pilot and administration.
NFR-3	**Reliability**	Traffic lights and signaling can be made accurately with the help of sensors. so it is more reliable.
NFR-4	**Performance**	Communication plays a vital role in transferring the crack-detected signal to the responsible authority so that they can take appropriate measures within a short span.
NFR-5	**Availability**	Our idea is to make the crack alert to all the trains passing through that fault-prone area.
NFR-6	**Scalability**	Our project is based on IoT & cloud, which makes the pilot and authorityupdated every single sec. Adhoc is easy to handle.

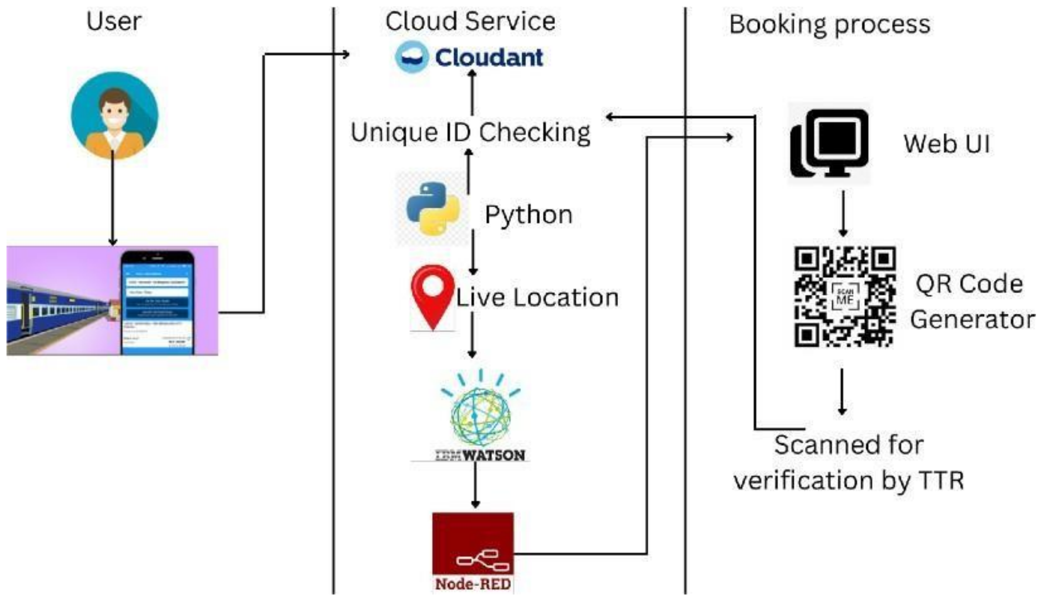
5. PROJECT DESIGN

5.1 DATA FLOW DIAGRAMS:



5.2 SOLUTION AND TECHNICAL ARCHITECTURE:





5.2 USER STORIES:

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Passenger	Registration	USN-1	As a passenger, I want to create a login credentials so I can securely access myself service online account.	Input data fields to enter:1.Username/email 2.Password 3.Re-enter password4.Security question 5.Security answer	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for creating an account.	I can receive confirmationemail & click confirm.	High	Sprint-1
		USN-3	As a user, I can also create an account usingGoogle.	I can register & access myaccount by using Google Login details.	High	Sprint-2
		USN-4	As a user, I can also create an account usingFacebook.	I can register & access myaccount by using Facebook login details.	Medium	Sprint-3
	Login	USN-5	As a user, I can login to the account byentering my email and password. As a user, I can login to the account through Facebook if I previously registered with it.	I can login to the system so that my information canonly be accessed by me.	High	Sprint-1

			As a user, I can reset my password if I have forgotten my password.			
	My Account	USN-6	As a user, I can view my personal account. As a user, I can edit my Profile. .	I can use my personalaccount for booking process.	High	Sprint-1
Customer Care Executive		CCE-1	As a customer care executive ,I can take complaints ,answe r calls from the customers regarding all the queries.	Pays attention to customer satisfaction to understand what services need improvements. Customer care executiveshould be able to assist	High	
				the users by easily communicating with them.		
Administrator		ADMIN-1	As an administrator I receive an email notification when a new user is registered.	The admin has the controlover the new user by receiving a notification. .	High	
		ADMIN-2	As an administrator I am able to add a new person to the database and backup can alsobe done.	The admin has the abilityto access the database.	Medium	
		ADMIN-3	As an administrator I am able to view contentthat to be viewed.	The details of the user should be given to the administrator impeccablywhen they request it.	Medium	

6. PROJECT PLANNING AND SCHEDULING

6.1 SPRINT PLANNING AND ESTIMATION:

SPRINT	FUNCTIONAL REQUIREMENT (EPIC)	USER STORY NUMBER	USER STORY/TASK	STORY POINTS	PRIORITY	TEAM MEMBERS
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password and confirming my password	2	High	mythiliy
Sprint-1	conformation	USN-2	As a user, I will receive confirmation email once I have registered for the application	1	High	Narmadha
Sprint-1	login	USN-3	As a user I can register for the application through Facebook	2	Low	Kirandeep
Sprint-1	Display train details	USN-4	As a user I can register for the application through gmail	2	Low	manojkumar
Sprint -2	Booking	USN-5	As a user, I can log into the application by entering email and password	1	High	mythiliy
Sprint -2		USN-6	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	2	Low	Kirandeep
Sprint -2	payment	USN-7	As a user, I can choose a pay through	1	Medium	Narmadha

			credit card/ debit card /UPI			
Sprint -2	Functional Requirement	USN-8	User story/Task	2	Low	Kirandeep
Sprint -3	Ticket generation	Usn-9	As a user, i can download the generated e-ticket for my journey along with the QR code which is used for verification during journey	1	High	mythiliy
Sprint -3	Ticket Status	USN-10	AS a user, I can see the status of my ticket	1	High	manojkumar
Sprint -3	Reminder Notification	USN-11	As a user, i get remainder about my journey a day before	2	High	manojkumar
Sprint -4	Ticket Cancellation	USN-12	As a user, train can be tracked using GPS	2	Medium	Narmadha
Sprint -4	Raise Queries	USN-13	As a user , queries can be raised by mail	1	Low	Kirandeep
Sprint -4	Answer queries	USN-14	As a user queries can be Answer via mail	1	Low	Narmadha
Sprint -4	Feed Details	USN-15	As a user information can be send as a feedback	1	Low	mythiliy

6.2 SPRINT DELIVERY SCHEDULE

Project Tracker, Velocity & Burndown Chart:

Sprint	Total Story points	Duration	Sprint Start Date	Sprint End date	Story points completed (as on planned End date)	Sprint Release Date
Sprint-1	20	6 Days	20 Oct 2022	29 Oct 2022	20	4 Nov 2022
Sprint-2	20	6 days	31 Oct 2022	05 Nov 2022	20	8 Nov 2022
Sprint-3	20	6 days	07 Oct 2022	12 Nov 2022	20	18 Nov 2022
Sprint-4	20	6 days	11 Oct 2022	17 Nov 2022	20	18 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
- Login
- Verification
- Ticket Booking
- Payment
- Ticket Cancellation
- Raise Queries

Sample code for features:

login.py:

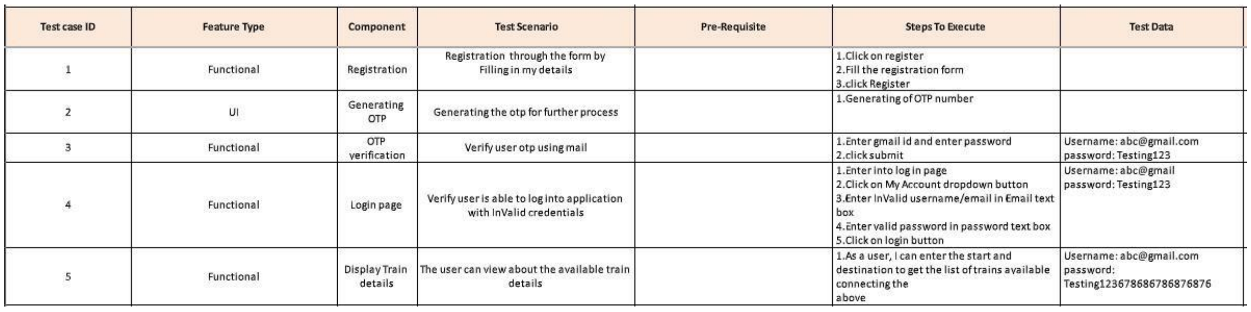
```
from tkinter import *
import sqlite3

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")
```

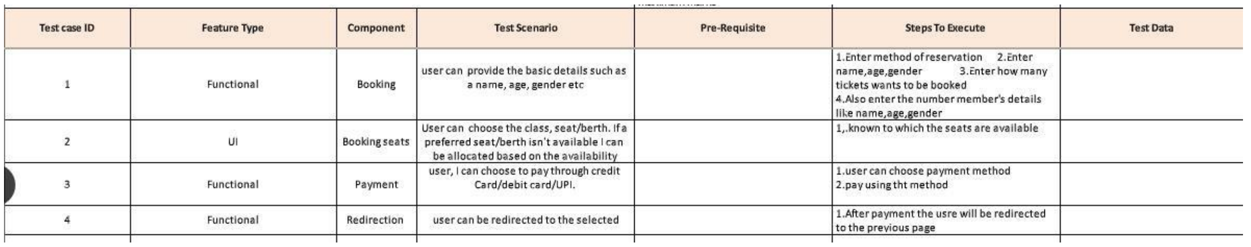
```
        cursor = conn.cursor()
        cursor.execute("CREATE TABLE IF NOT EXISTS `member` (mem_id
INTEGER NOT NULL PRIMARY KEY  AUTOINCREMENT, username TEXT,
password TEXT)")
        cursor.execute("SELECT * FROM `member` WHERE `username` = 'admin'
AND `password` = 'admin'")
        if cursor.fetchone() 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()
```

8.TESTING

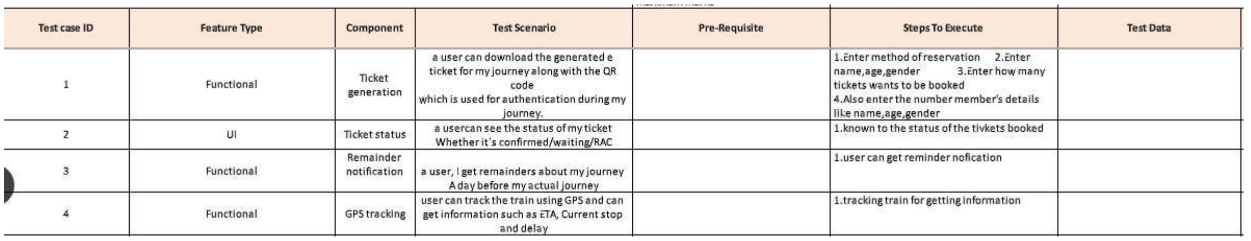
8.1 TEST CASES:



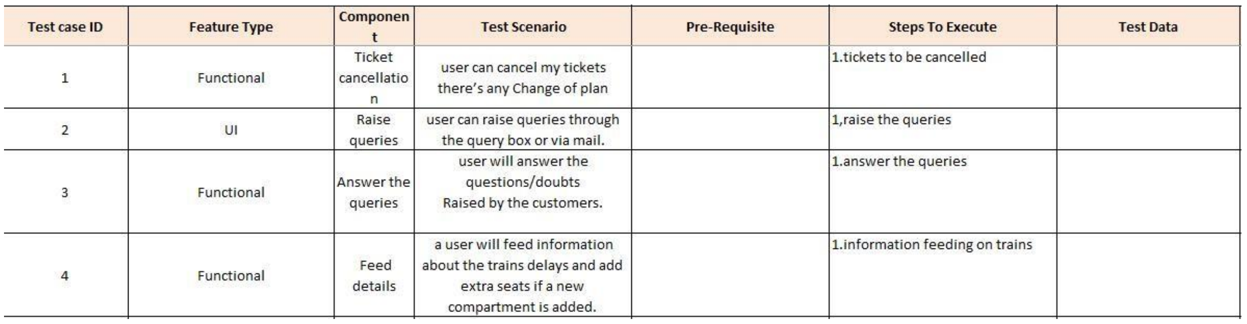
Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data
1	Functional	Registration	Registration through the form by Filling in my details		1.Click on register 2.Fill the registration form 3.click Register	
2	UI	Generating OTP	Generating the otp for further process		1.Generating of OTP number	
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
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
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: Testing123678686786876876



Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data
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	
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 availability		1,.known to which the seats are available	
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	
4	Functional	Redirection	user can be redirected to the selected		1.After payment the usre will be redirected to the previous page	

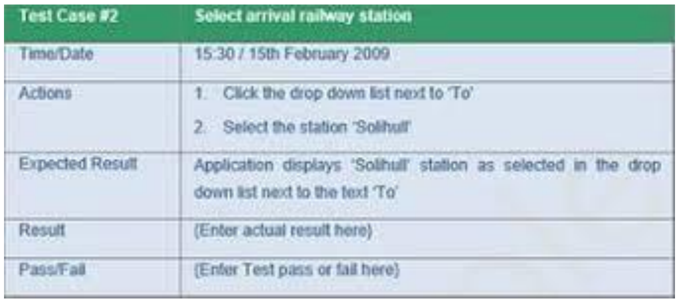


Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data
1	Functional	Ticket generation	a user can download the generated e ticket for my journey along with the QR code which is used for authentication during my journey.		1.Enter method of reservation 2.Enter name,age,gender 3.Enter how many tickets wants to be booked 4.Also enter the number member's details like name,age,gender	
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	
3	Functional	Remainder notification	a user, I get remainders about my journey A day before my actual journey		1.user can get reminder nofication	
4	Functional	GPS tracking	user can track the train using GPS and can get information such as ETA, Current stop and delay		1.tracking train for getting information	



Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data
1	Functional	Ticket cancellation	user can cancel my tickets there's any Change of plan		1.tickets to be cancelled	
2	UI	Raise queries	user can raise queries through the query box or via mail.		1,raise the queries	
3	Functional	Answer the queries	user will answer the questions/doubts Raised by the customers.		1.answer the queries	
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	

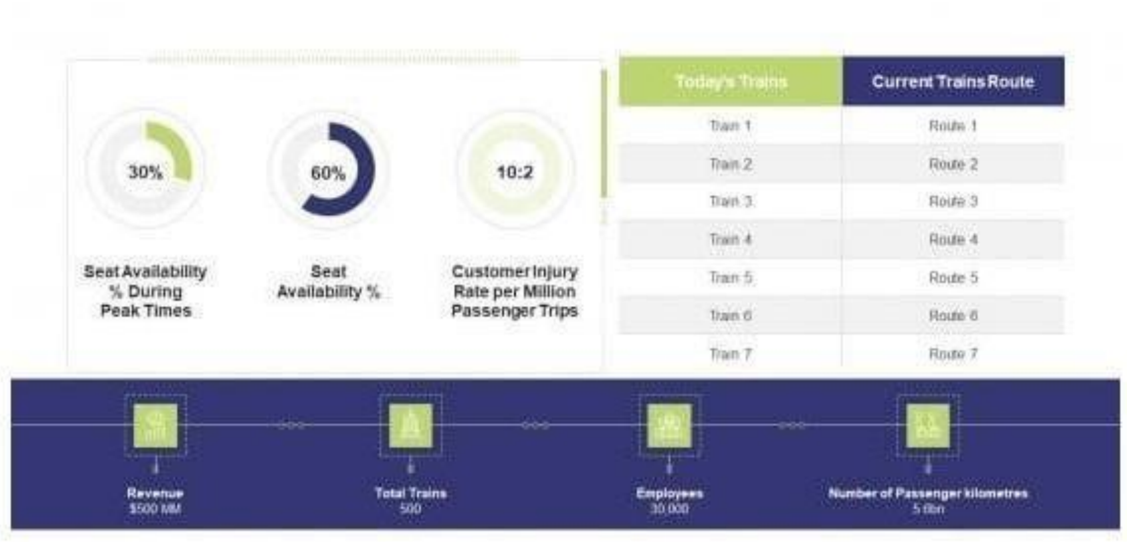
8.2 USER ACCEPTANCE TESTING:



Test Case #2	Select arrival railway station
Time/Date	15:30 / 15th February 2009
Actions	1. Click the drop down list next to 'To' 2. Select the station 'Solihull'
Expected Result	Application displays 'Solihull' station as selected in the drop down list next to the text 'To'
Result	(Enter actual result here)
Pass/Fail	(Enter Test pass or fail here)

9. RESULTS

9.1 PERFORMANCE METRICS:


30%
Seat Availability % During Peak Times
60%
Seat Availability %
10:2
Customer Injury Rate per Million Passenger Trips

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

Revenue $500 MM
Total Trains 500
Employees 30,000
Number of Passenger kilometres 5 Bn

10. ADVANTAGES AND DISADVANTAGES

10.1 ADVANTAGES:

- Better organized
- Suitable for longer journey
- Promotes tourism
- Generates employment

10.2 DISADVANTAGES:

- Highly inflexible
- Costly if the routes are small
- Trains parts are pretty old
- Unsuitable for perishable and fragile items.

11. CONCLUSION

The railway industry is on its way to integrate predictive maintenance and Big Data. Recent advancements in sensors and condition monitoring technologies have led to continuous data collection and evaluation, significantly minimising the number and cost of unscheduled maintenance.

Most significant improvements have been evidenced by more informative and user-friendly websites, mobile applications for real-time information about vehicles in motion, and e-ticket purchases and timetable information implemented at stations and stops. With the rise of Industry 4.0, railway companies can now ensure that they are prepared to avoid the surprise of equipment downtime.

12. FUTURE SCOPE

The contribution of railways to sustainability is to provide efficient services, transferring traffic from roads and airplanes offering a real alternative to less sustainable transport modes. Rail is a vital part of the solution to the global challenge of climate change.

These track improvements could include junction rearrangements, curve easing, deviations, passing loops and level crossing removals. There are also opportunities for new technology and train options that may reduce journey times.

13.APPENDIX

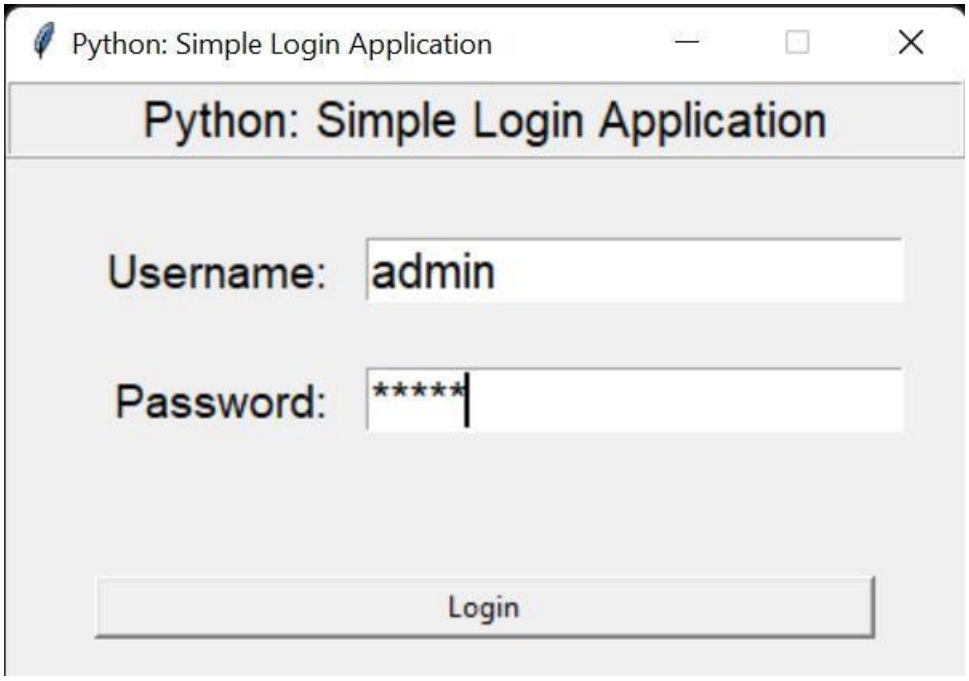
13.1 SOURCE CODE:

SPRINT 1:

AdminLogin.py:

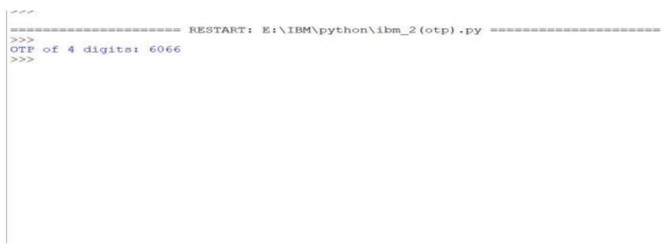
```
from tkinter import *
import sqlite3

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()
```


Python: Simple Login Application
Python: Simple Login Application
Username:
admin
Password:
*****
Login

<u>Generation of OTP.py</u>

```
# import library
import math, random

# function to generate OTP
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())
```



```
>>>
==================== RESTART: E:\IBM\python\ibm_2(otp).py ====================
>>>
OTP of 4 digits: 6066
>>>
```

Verify the OTP.py:

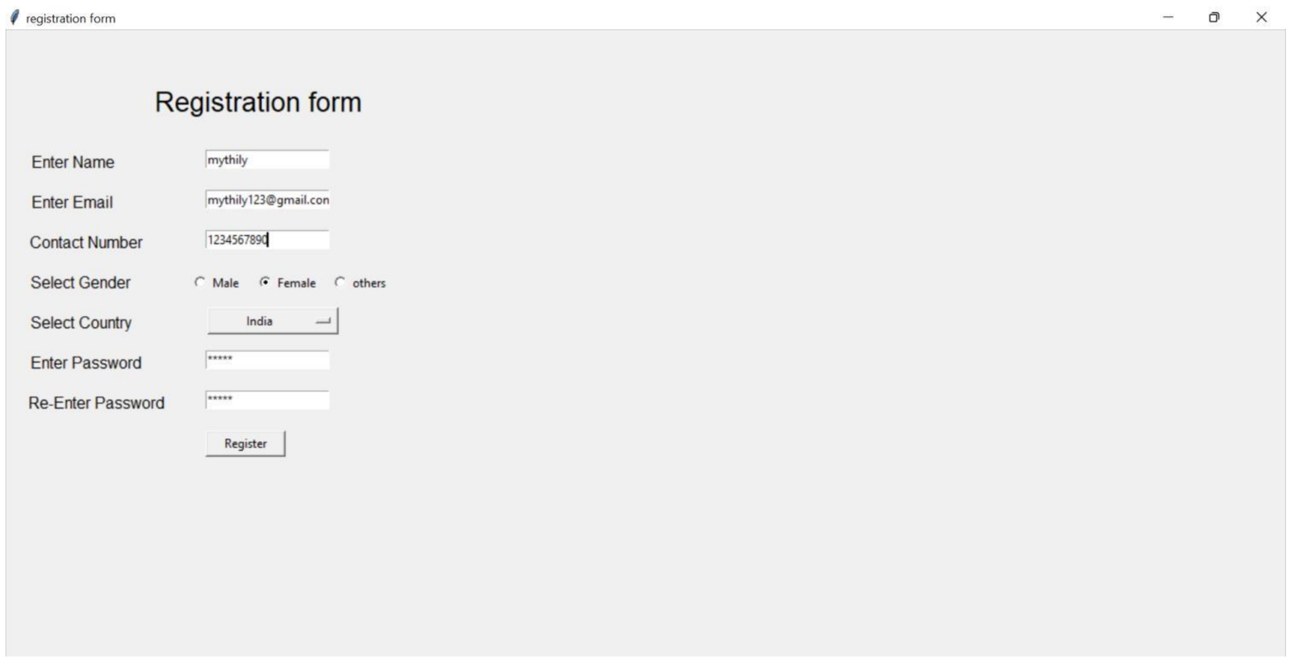
```
import os
import math
import random
import smtplib

digits = "0123456789"
OTP = ""

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

otp = OTP + " is your OTP"
message = otp
s = smtplib.SMTP('smtp.gmail.com', 587)
s.starttls()

emailid = input("Enter your email: ")
s.login("YOUR Gmail ID", "YOUR APP PASSWORD")
s.sendmail('&&&&&&',emailid,message)

a = input("Enter your OTP >>: ")
if a == OTP:
    print("Verified")
else:
    print("Please Check your OTP again")
```

UserSide.py:

```
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()
```



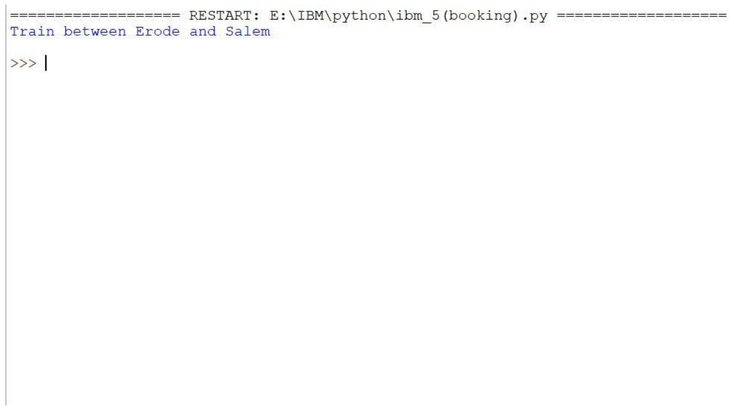
Registration form

Enter Name	mythily
Enter Email	mythily123@gmail.con
Contact Number	1234567890
Select Gender	Male [✓ Female] others
Select Country	India
Enter Password	*****
Re-Enter Password	*****

Route.py:

```
   id=-
1603228437&us
er_t# import
moduleimport
requests
from bs4 import BeautifulSoup

# user define function
# Scrape the data
def getdata(url):
   r = requests.get(url)
   return r.text



# input by geek
from_Station_code = "Erode"
from_Station_name = "Erode"

To_station_code = "Salem"
To_station_name = "Salem"#
url
url = "https://www.railyatri.in/booking/trains-between-
stations?from_code="+from_Station_code+"&from_name="+from_Station_name
+"+JN+&journey_date=+Wed&src=tbs&to_code=" + \
To_station_code+"&to_name="+To_station_name + \
"+JN+&user_oken=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()
```

```
print("Train between "+from_Station_name+" and "+To_station_name)print("")

        # Display the result
        for item in result:
            if item != "":
                print(item)
```

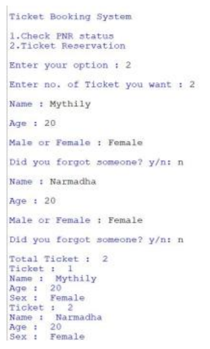


```
=================== RESTART: E:\IBM\python\ibm_5(booking).py ===================
Train between Erode and Salem

>>> |
```

SPRINT 2:

Booking.py:

```
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 : ")
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
```

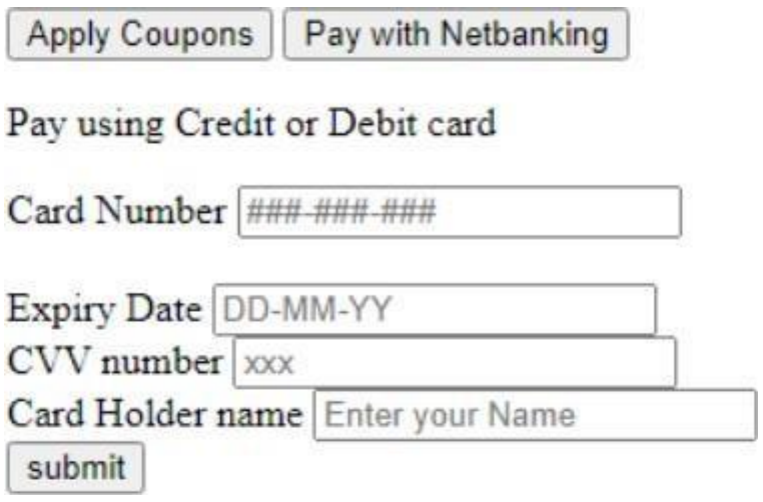


```
Ticket Booking System

1.Check PNR status
2.Ticket Reservation

Enter your option : 2

Enter no. of Ticket you want : 2

Name : Mythily

Age : 20

Male or Female : Female

Did you forgot someone? y/n: n

Name : Narmadha

Age : 20

Male or Female : Female

Did you forgot someone? y/n: n

Total Ticket :  2
Ticket :  1
Name :  Mythily
Age :  20
Sex :  Female
Ticket :  2
Name :  Narmadha
Age :  20
Sex :  Female
```

Payment.py:

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


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_n
        ame="First            name",
        max_length=30
    )

    last_name                     =
        models.CharField(verbose_n
        ame="Last             name",
        max_length=40
    )

    city                    =
        models.CharField(  ver
        bose_name="City",
        max_length=40
    )

    stripe_id =
        models.CharField(verbose_
        name="Stripe ID",
        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
    )

    date_of_birth =
        models.DateField(verbose_nam
        e="Date of birth"
    )

    postal_code =
        models.CharField(verbose_na
        me="Postal code",
        max_length=10,
        blank=True
    )

    address = models.CharField(verbose_name="Address",max_length=255,
        abstract = True


class UserProfile(Profile):
    """
    User's profile model.
    """

    user = models.OneToOneField(
        to=User, on_delete=models.CASCADE, related_name="profile",
    )

    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),
    address="Myśliwska 14",
    postal_code="15-569",
    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,
        },
    },
)

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)

stripe.SetupIntent.create( payment_metho
    d_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
```

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

stripe.Charge.create( amou
    nt=amount,
    currency="pln",
    source=user2.stripe_id,
    description=description
)

stripe.PaymentIntent.cancel(payment_intent.id)


        unique_together = ("user", "group")
```



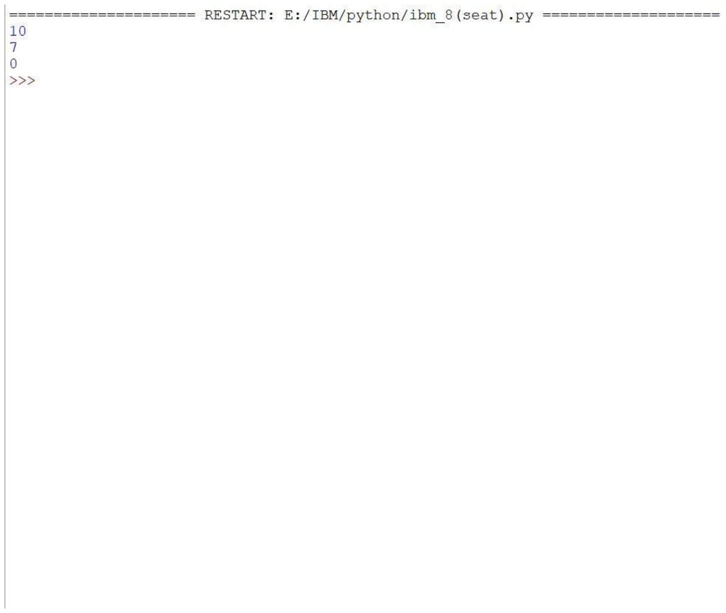
NextPage.py:

```
import logging

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

@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(curre
                    nt_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 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):
        if self.form.validate_on_submit():
            try:
                self.password_update_handler.apply_changeset(cur
                    rent_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_password.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]
    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"))
```

seatCheck.py:

```
def berth_type(s):

    if s>0 and s<73:
        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
```



```
==================== RESTART: E:/IBM/python/ibm_8(seat).py ===================
10
7
0
>>>
```

SPRINT 3:

QR.py: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


  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


      ticket_id=self.source[0]+selfdestination[0]+"0"+str(self.Counter)
        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.__destination
        elif self.__destination=="Chennai":
            return self.__destination
        elif self.__destination=="Kolkata":
            return self.__destination

        else:
            return None
```

confirmation.py:

```
# import module
import requests
from bs4 import BeautifulSoup
import pandas as pd

# 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(htmldata, '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())

    # 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'])
```

track.py:

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from PIL import Image, ImageDraw

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')
    axis1.set_ylabel('Latitude')
    axis1.set_xticklabels(x_ticks)
    axis1.set_yticklabels(y_ticks)
    axis1.grid()
    plt.show()
```

<u>notification.py:</u>

```
import pyttsx3
from plyer import notification
import time


# 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:
        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)


# Driver's Code
```

```
if__name__== '__main__':
    Take_break()
```

SPRINT 4:

ansqueries.py:

```
import email, smtplib, ssl

from email import encoders
from email.mime.base import MIMEBase
from email.mime.multipart import MIMEMultipart
from email.mime.text import MIMEText

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:")

# 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 emailencoders.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)
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)
```

feedback.py:

```
# Python program to find PNR
# status using RAILWAY API

# import required modules
import requests, json

# Enter API key here
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:

    # 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"]

    # 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 list
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")
```

raisequeries.py:

```
import smtplib, ssl
from email.mime.text import MIMEText
from email.mime.multipart import MIMEMultipart

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>
       <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()
    )
```

ticket.py:

```
from pickle import load,dump
import time
import random
import  os
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"
        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):
            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
        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("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")
                    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)
                        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
             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\t\t\t\t\t\t\tLOADING. .",
             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\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:
                  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")
                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
            print"="*80
            print
            tick.cancellation()
        elif ch==5:
            print "="*80
            print("PNR STATUS".center(80))
            print"="*80
            print
            tick.display()
        elif ch==6:
            quit()

        raw_input("PRESS ENTER TO GO TO BACK MENU".center(80))
        os.system('cls')
         menu()
```

<u>**13.2**</u> <u>**PROJECT DEMO LINK:**</u>

https://github.com/IBM-EPBL/IBM-Project-35515-1660285493