Railway Reservation System

Group - 28

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HONOR CODE:

I pledge, in my honor, to uphold UT Arlington’s tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or that I contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

CONTRIBUTION:

Creating Database: Kiran Kumar
Queries: Kiran Kumar and Sanjeev Reddy
Python Code: Kiran Kumar and Sanjeev Reddy
Documentation: Kiran Kumar and Sanjeev Reddy

Kiran Kumar
has created the Databases for the Project . After that the first 3 Queries were written by Sanjeev Reddy and remaining 3 Queries were written by Kiran Kumar. The code is also developed for the respective queries by both of us. Finally in Documentation, the report is done by Kiran Kumar and the readme file by Sanjeev Reddy.

Project:

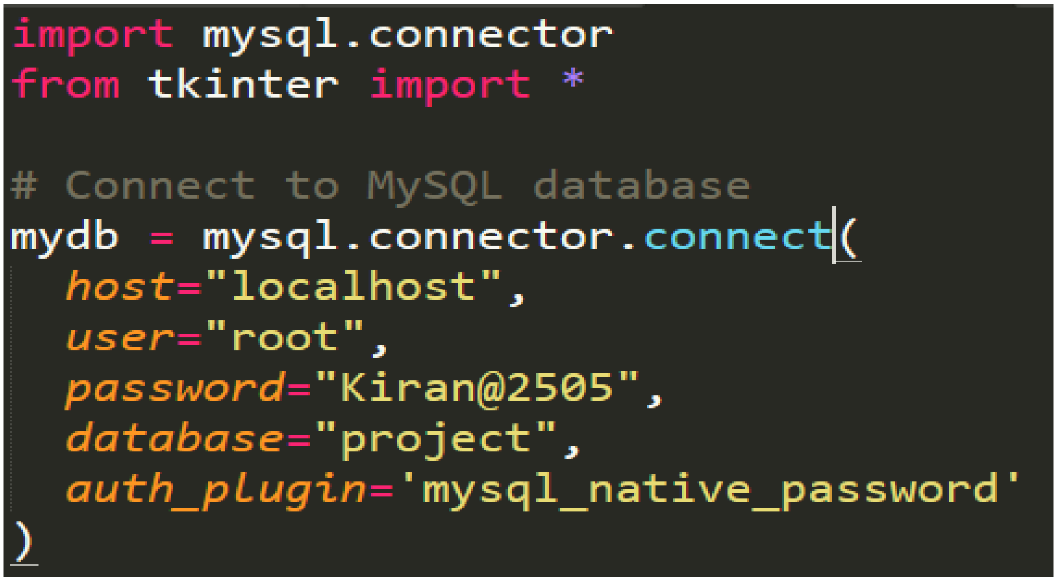
The database consists of 4 tables: Train, Train_status, Passenger, Booked.

1. Table Train have all the information about the trains. Train Number, Train Name, Premium Fair, General Fair, Source Station, Destination Station are the columns in this table.
2. Train_status has a schedule of trains and seat availability. TrainDate, TrainName, PremiumSeatsAvailable, GenSeatsAvailable, PremiumSeatsOccupied, GenSeatsOccupied. These are the columns.
3. The information of passengers is in the passengers table and it consists of first_name, last_name, address, city, county, phone, SSN, bdate.
4. Finally the status of the ticket, whether the ticket is booked or not is given by the booked table. Passanger_ssn, Train_Number, Ticket_Type, Status this is the information available in this table.

Python program that connects to a MySQL database and performs various queries to retrieve data related to trains, passengers, and bookings. It also defines functions to display the results of these queries on a graphical user interface (GUI) built using the Tkinter library.

The program first imports the necessary libraries, including the `mysql.connector` library for connecting to the MySQL database, and the `Tkinter` library for building the GUI.

The program then connects to the MySQL database using the `mysql.connector.connect()` method, passing in the appropriate credentials such as the host, user, password, database name, and authentication plugin.



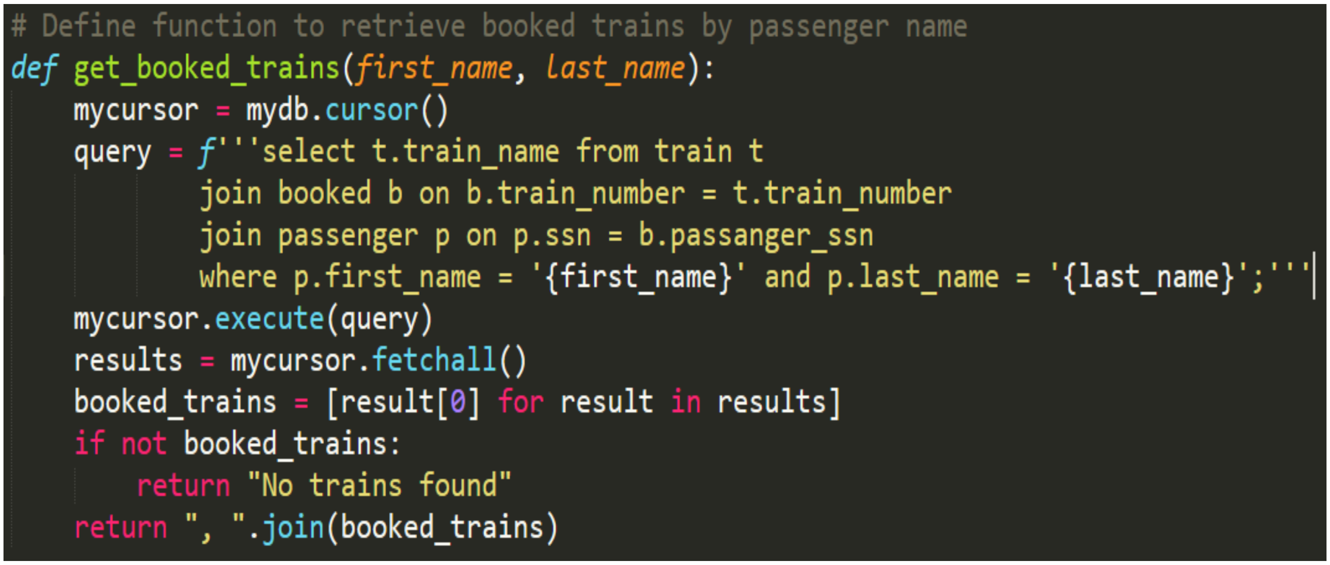
```python
import mysql.connector
from tkinter import *

# Connect to MySQL database
mydb = mysql.connector.connect(
  host="localhost",
  user="root",
  password="Kiran@2505",
  database="project",
  auth_plugin='mysql_native_password'
)
```

Before connecting to MySQL, make sure that the server is running on the local computer. And download the SQL file and the user and password should be changed before running the python code.

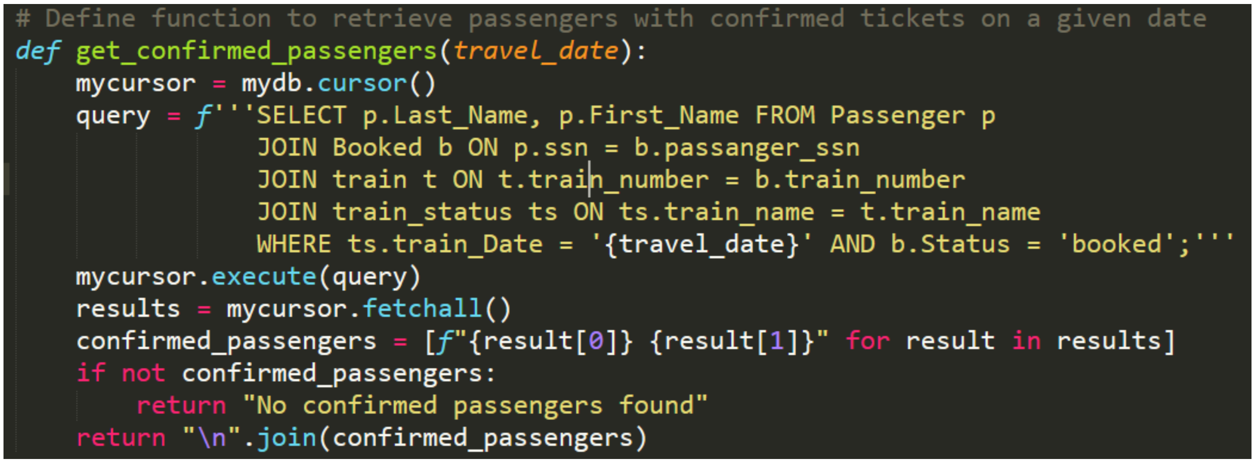
Next, the program defines several functions that perform various queries to retrieve data from the database. These functions include:

- `get_booked_trains()`: This function takes in the first name and last name of a passenger and returns a list of the names of the trains that the passenger has booked.



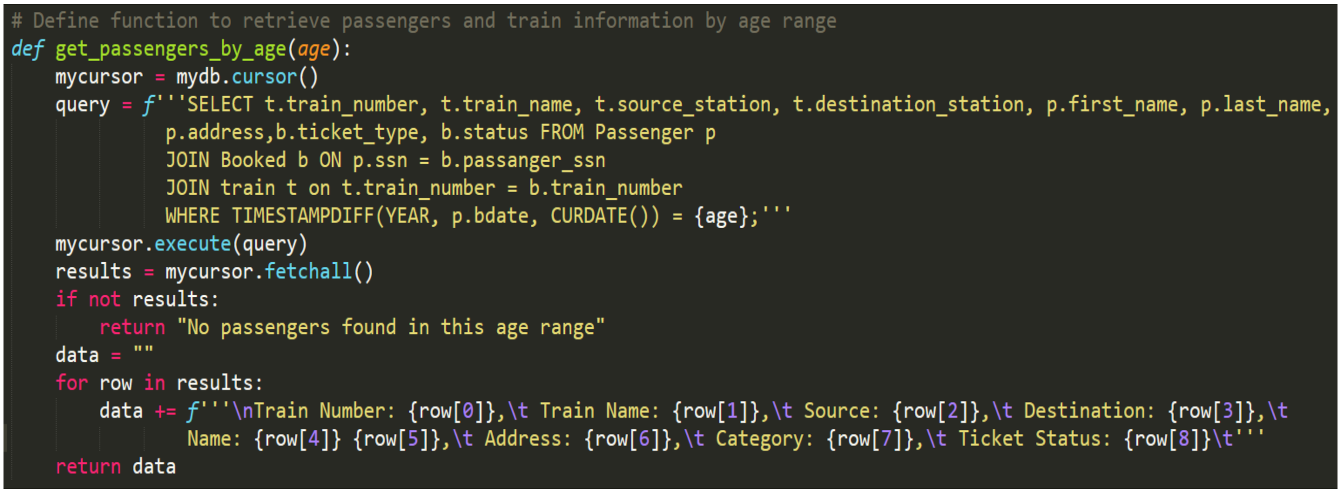
```python
# Define function to retrieve booked trains by passenger name
def get_booked_trains(first_name, last_name):
    mycursor = mydb.cursor()
    query = f'''select t.train_name from train t
            join booked b on b.train_number = t.train_number
            join passenger p on p.ssn = b.passanger_ssn
            where p.first_name = '{first_name}' and p.last_name = '{last_name}';'''
    mycursor.execute(query)
    results = mycursor.fetchall()
    booked_trains = [result[0] for result in results]
    if not booked_trains:
        return "No trains found"
    return ", ".join(booked_trains)
```

- `get_confirmed_passengers()`: This function takes in a travel date and returns a list of the first and last names of passengers who have confirmed tickets for trains on that date.



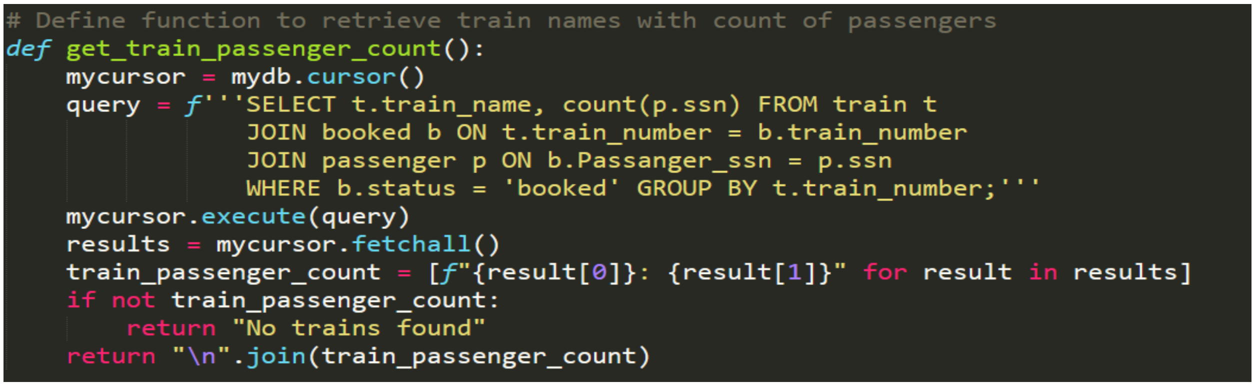
```
# Define function to retrieve passengers with confirmed tickets on a given date
def get_confirmed_passengers(travel_date):
    mycursor = mydb.cursor()
    query = f'''SELECT p.Last_Name, p.First_Name FROM Passenger p
                JOIN Booked b ON p.ssn = b.passanger_ssn
                JOIN train t ON t.train_number = b.train_number
                JOIN train_status ts ON ts.train_name = t.train_name
                WHERE ts.train_Date = '{travel_date}' AND b.Status = 'booked';'''
    mycursor.execute(query)
    results = mycursor.fetchall()
    confirmed_passengers = [f"{result[0]} {result[1]}" for result in results]
    if not confirmed_passengers:
        return "No confirmed passengers found"
    return "\n".join(confirmed_passengers)
```

- `get_passengers_by_age()`: This function takes in age and returns a list of passengers and their corresponding train information (such as train number, train name, source station, destination station, address, and ticket status).



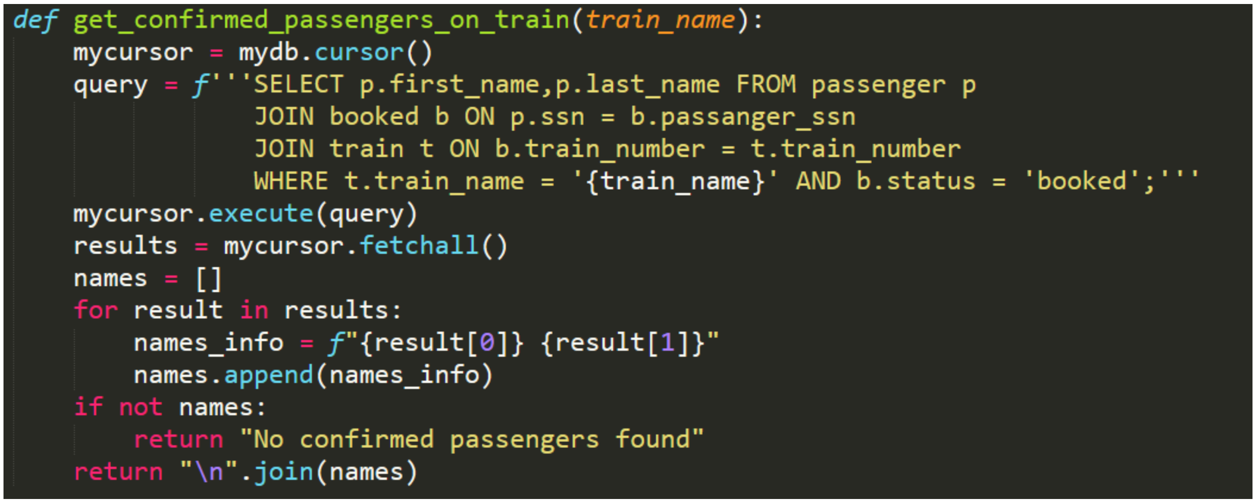
```
# Define function to retrieve passengers and train information by age range
def get_passengers_by_age(age):
    mycursor = mydb.cursor()
    query = f'''SELECT t.train_number, t.train_name, t.source_station, t.destination_station, p.first_name, p.last_name,
              p.address,b.ticket_type, b.status FROM Passenger p
              JOIN Booked b ON p.ssn = b.passanger_ssn
              JOIN train t on t.train_number = b.train_number
              WHERE TIMESTAMPDIFF(YEAR, p.bdate, CURDATE()) = {age};'''
    mycursor.execute(query)
    results = mycursor.fetchall()
    if not results:
        return "No passengers found in this age range"
    data = ""
    for row in results:
        data += f'''\nTrain Number: {row[0]},\t Train Name: {row[1]},\t Source: {row[2]},\t Destination: {row[3]},\t
              Name: {row[4]} {row[5]},\t Address: {row[6]},\t Category: {row[7]},\t Ticket Status: {row[8]}\t'''
    return data
```

- `get_train_passenger_count()`: This function returns a list of the names of all trains and their corresponding passenger count, where the passenger count only includes passengers who have booked a ticket on the train.



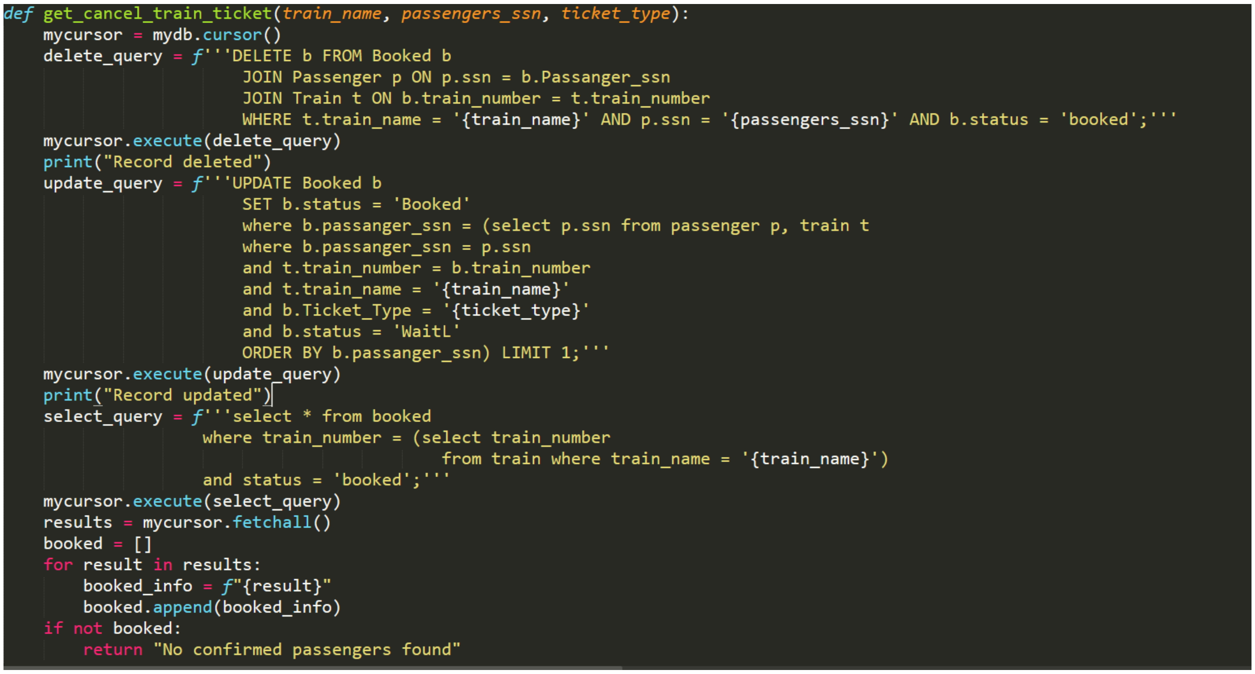
```
# Define function to retrieve train names with count of passengers
def get_train_passenger_count():
    mycursor = mydb.cursor()
    query = f'''SELECT t.train_name, count(p.ssn) FROM train t
                JOIN booked b ON t.train_number = b.train_number
                JOIN passenger p ON b.Passanger_ssn = p.ssn
                WHERE b.status = 'booked' GROUP BY t.train_number;'''
    mycursor.execute(query)
    results = mycursor.fetchall()
    train_passenger_count = [f"{result[0]}: {result[1]}" for result in results]
    if not train_passenger_count:
        return "No trains found"
    return "\n".join(train_passenger_count)
```

- `get_confirmed_passengers_on_train()`: This function takes in a train name and returns a count of the number of passengers who have confirmed tickets for that train.



```
def get_confirmed_passengers_on_train(train_name):
    mycursor = mydb.cursor()
    query = f'''SELECT p.first_name,p.last_name FROM passenger p
                JOIN booked b ON p.ssn = b.passanger_ssn
                JOIN train t ON b.train_number = t.train_number
                WHERE t.train_name = '{train_name}' AND b.status = 'booked';'''
    mycursor.execute(query)
    results = mycursor.fetchall()
    names = []
    for result in results:
        names_info = f"{result[0]} {result[1]}"
        names.append(names_info)
    if not names:
        return "No confirmed passengers found"
    return "\n".join(names)
```

- `get_cancel_train_ticket()`: This function takes in a train name,Passenger SSN, and Ticket Type and returns an updated list of passengers traveling in the respective train.

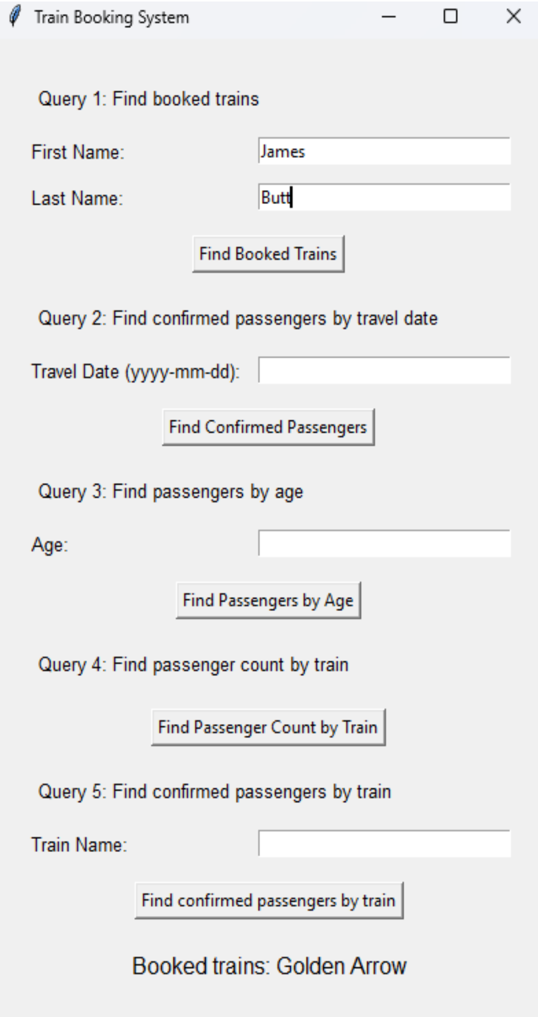


```
def get_cancel_train_ticket(train_name, passengers_ssn, ticket_type):
    mycursor = mydb.cursor()
    delete_query = f'''DELETE b FROM Booked b
                        JOIN Passenger p ON p.ssn = b.Passanger_ssn
                        JOIN Train t ON b.train_number = t.train_number
                        WHERE t.train_name = '{train_name}' AND p.ssn = '{passengers_ssn}' AND b.status = 'booked';'''
    mycursor.execute(delete_query)
    print("Record deleted")
    update_query = f'''UPDATE Booked b
                        SET b.status = 'Booked'
                        where b.passanger_ssn = (select p.ssn from passenger p, train t
                        where b.passanger_ssn = p.ssn
                        and t.train_number = b.train_number
                        and t.train_name = '{train_name}'
                        and b.Ticket_Type = '{ticket_type}'
                        and b.status = 'WaitL'
                        ORDER BY b.passanger_ssn) LIMIT 1;'''
    mycursor.execute(update_query)
    print("Record updated")
    select_query = f'''select * from booked
                    where train_number = (select train_number
                                            from train where train_name = '{train_name}')
                    and status = 'booked';'''
    mycursor.execute(select_query)
    results = mycursor.fetchall()
    booked = []
    for result in results:
        booked_info = f"{result}"
        booked.append(booked_info)
    if not booked:
        return "No confirmed passengers found"
```

After defining these functions, the program defines several functions that handle the GUI interactions. These functions include:

- `show_booked_trains()`: This function is called when the user enters a passenger's first name and last name into the GUI and clicks a "Find Booked Trains" button. It calls the `get_booked_trains()` function to retrieve the booked trains for the specified passenger and displays the result on the GUI.

  Output:


Train Booking System
Find Booked Trains
Find Confirmed Passengers
Find Passengers by Age
Find Passenger Count by Train
Find confirmed passengers by train

Query 1: Find booked trains

First Name: James

Last Name: Butt

Query 2: Find confirmed passengers by travel date

Travel Date (yyyy-mm-dd):

Query 3: Find passengers by age

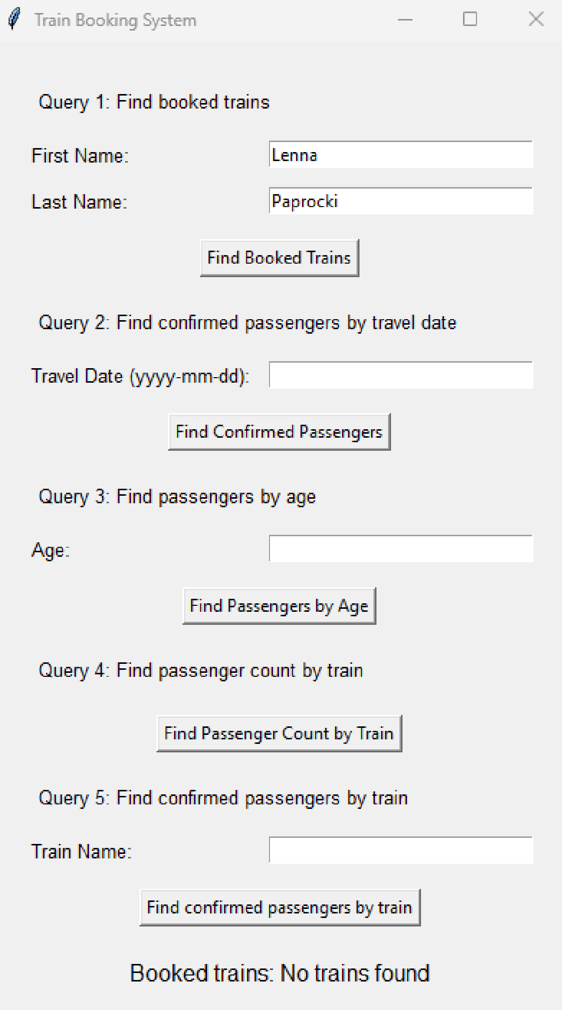
Age:

Query 4: Find passenger count by train

Query 5: Find confirmed passengers by train

Train Name:

Booked trains: Golden Arrow


Train Booking System
Find Booked Trains
Find Confirmed Passengers
Find Passengers by Age
Find Passenger Count by Train
Find confirmed passengers by train

Query 1: Find booked trains

First Name: Lenna

Last Name: Paprocki

Query 2: Find confirmed passengers by travel date

Travel Date (yyyy-mm-dd):

Query 3: Find passengers by age

Age:

Query 4: Find passenger count by train

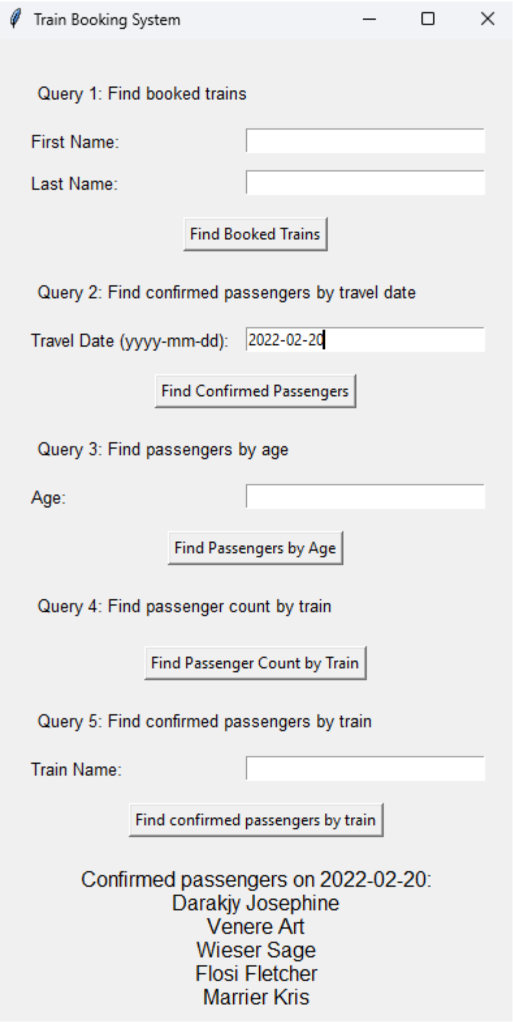
Query 5: Find confirmed passengers by train

Train Name:

Booked trains: No trains found

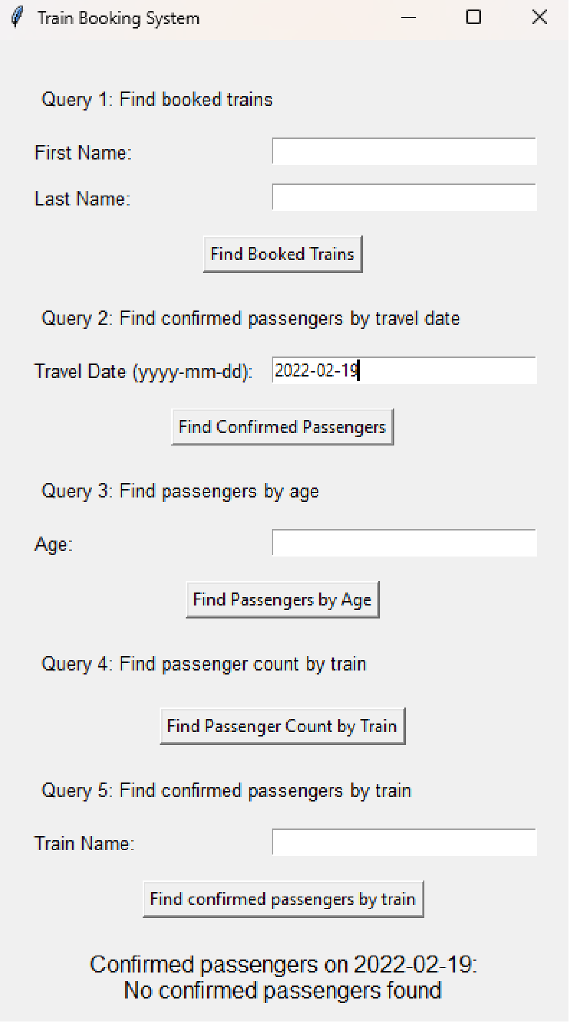
- `show_confirmed_passengers()`: This function is called when the user enters a travel date into the GUI and clicks a "Find Confirmed Passengers" button. It calls the `get_confirmed_passengers()` function to retrieve the confirmed passengers for the specified travel date and displays the result on the GUI.

  Output:


Train Booking System
Query 1: Find booked trains
First Name:
Last Name:
Find Booked Trains
Query 2: Find confirmed passengers by travel date
Query 3: Find passengers by age
Age:
Find Passengers by Age
Query 4: Find passenger count by train
Find Passenger Count by Train
Query 5: Find confirmed passengers by train
Train Name:
Find confirmed passengers by train
Find Confirmed Passengers

Travel Date (yyyy-mm-dd): 2022-02-20

Confirmed passengers on 2022-02-20:
Darakjy Josephine
Venere Art
Wieser Sage
Flosi Fletcher
Marrier Kris

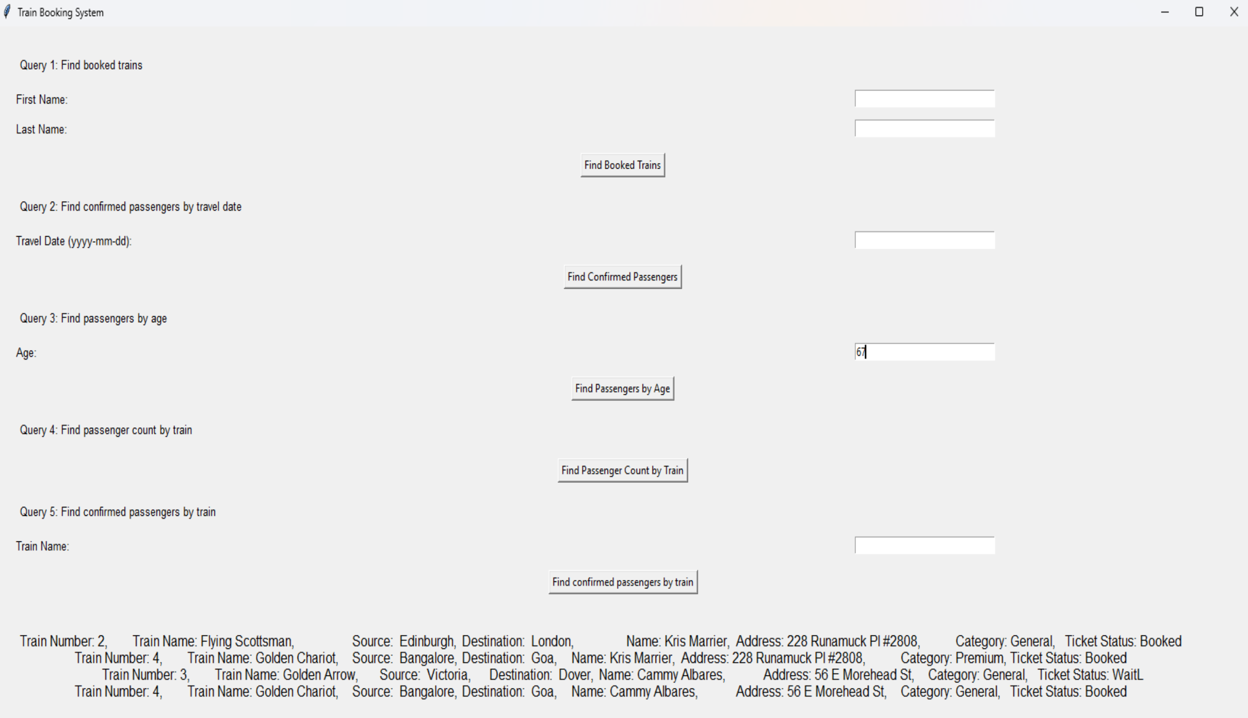

Train Booking System
Query 1: Find booked trains
First Name:
Last Name:
Find Booked Trains
Query 2: Find confirmed passengers by travel date
Find Confirmed Passengers
Query 3: Find passengers by age
Age:
Find Passengers by Age
Query 4: Find passenger count by train
Find Passenger Count by Train
Query 5: Find confirmed passengers by train
Train Name:
Find confirmed passengers by train

Travel Date (yyyy-mm-dd): 2022-02-19

Confirmed passengers on 2022-02-19:
No confirmed passengers found

- `show_passengers_by_age()`: This function is called when the user enters age into the GUI and clicks a "Find Passengers by Age" button. It calls the `get_passengers_by_age()` function to retrieve the passengers within the specified age range and displays the result on the GUI.

Output:


Train Booking System
Find Booked Trains
Find Confirmed Passengers
Find Passengers by Age
Find Passenger Count by Train
Find confirmed passengers by train

Query 1: Find booked trains

First Name:

Last Name:

Query 2: Find confirmed passengers by travel date

Travel Date (yyyy-mm-dd):

Query 3: Find passengers by age

Age: 67

Query 4: Find passenger count by train

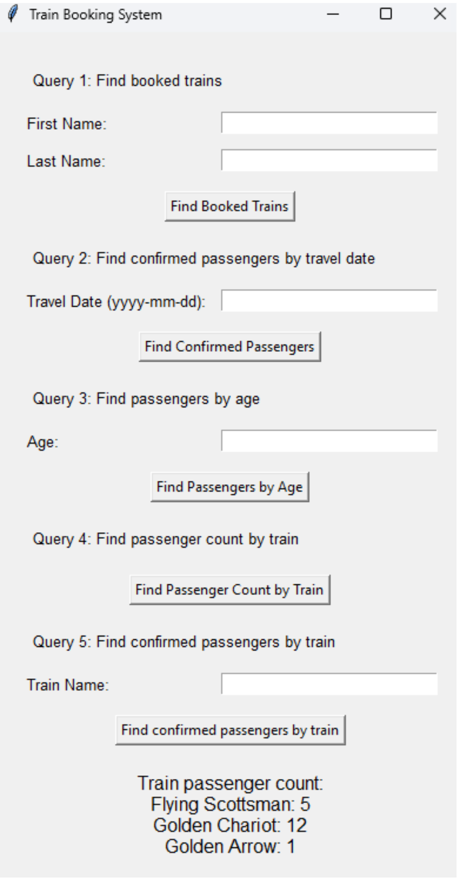
Query 5: Find confirmed passengers by train

Train Name:

```
Train Number: 2,      Train Name: Flying Scottsman,             Source:  Edinburgh,  Destination:  London,           Name: Kris Marrier,  Address: 228 Runamuck Pl #2808,        Category: General,   Ticket Status: Booked
        Train Number: 4,      Train Name: Golden Chariot,   Source:  Bangalore,  Destination:  Goa,    Name: Kris Marrier,  Address: 228 Runamuck Pl #2808,        Category: Premium, Ticket Status: Booked
            Train Number: 3,      Train Name: Golden Arrow,     Source:  Victoria,     Destination:  Dover,  Name: Cammy Albares,         Address: 56 E Morehead St,    Category: General,   Ticket Status: WaitL
        Train Number: 4,      Train Name: Golden Chariot,   Source:  Bangalore,  Destination:  Goa,    Name: Cammy Albares,         Address: 56 E Morehead St,    Category: General,   Ticket Status: Booked
```

- `show_train_passenger_count()`: This function is called when the user clicks a "Find Passenger Count by Train" button. It calls the `get_train_passenger_count()` function to retrieve the passenger count for all trains and displays the result on the GUI.

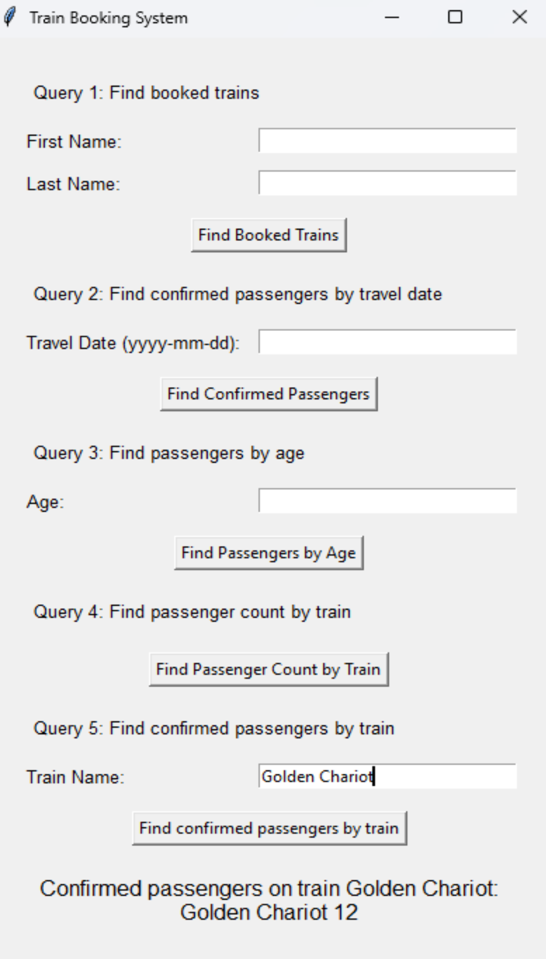
  Output:


Train Booking System
Query 1: Find booked trains
First Name:
Last Name:
Find Booked Trains
Query 2: Find confirmed passengers by travel date
Travel Date (yyyy-mm-dd):
Find Confirmed Passengers
Query 3: Find passengers by age
Age:
Find Passengers by Age
Query 4: Find passenger count by train
Find Passenger Count by Train
Query 5: Find confirmed passengers by train
Train Name:
Find confirmed passengers by train

```
Train passenger count:
Flying Scottsman: 5
Golden Chariot: 12
Golden Arrow: 1
```

- `show_confirmed_passengers_on_train()`: This function is called when the user enters train name into the GUI and clicks a "Find confirmed passengers by train” button. It calls the `get_confirmed_passengers_on_train()` function to retrieve the train name and passengers traveling in it and displays the result on the GUI.

Output:


Train Booking System
Find Booked Trains
Find Confirmed Passengers
Find Passengers by Age
Find Passenger Count by Train
Find confirmed passengers by train

Query 1: Find booked trains

First Name:

Last Name:

Query 2: Find confirmed passengers by travel date

Travel Date (yyyy-mm-dd):

Query 3: Find passengers by age

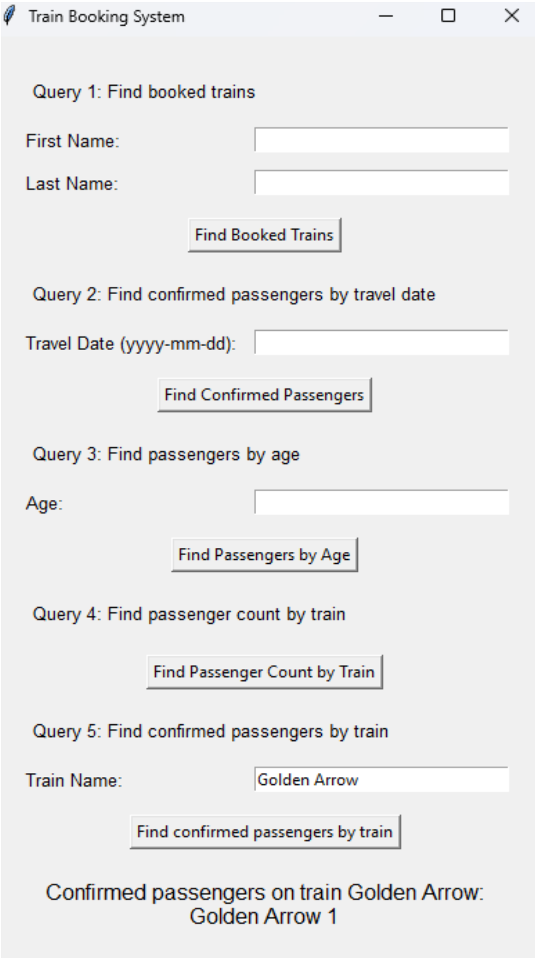
Age:

Query 4: Find passenger count by train

Query 5: Find confirmed passengers by train

Train Name: Golden Chariot

Confirmed passengers on train Golden Chariot:
Golden Chariot 12


Train Booking System
Find Booked Trains
Find Confirmed Passengers
Find Passengers by Age
Find Passenger Count by Train
Find confirmed passengers by train

Query 1: Find booked trains

First Name:

Last Name:

Query 2: Find confirmed passengers by travel date

Travel Date (yyyy-mm-dd):

Query 3: Find passengers by age

Age:

Query 4: Find passenger count by train

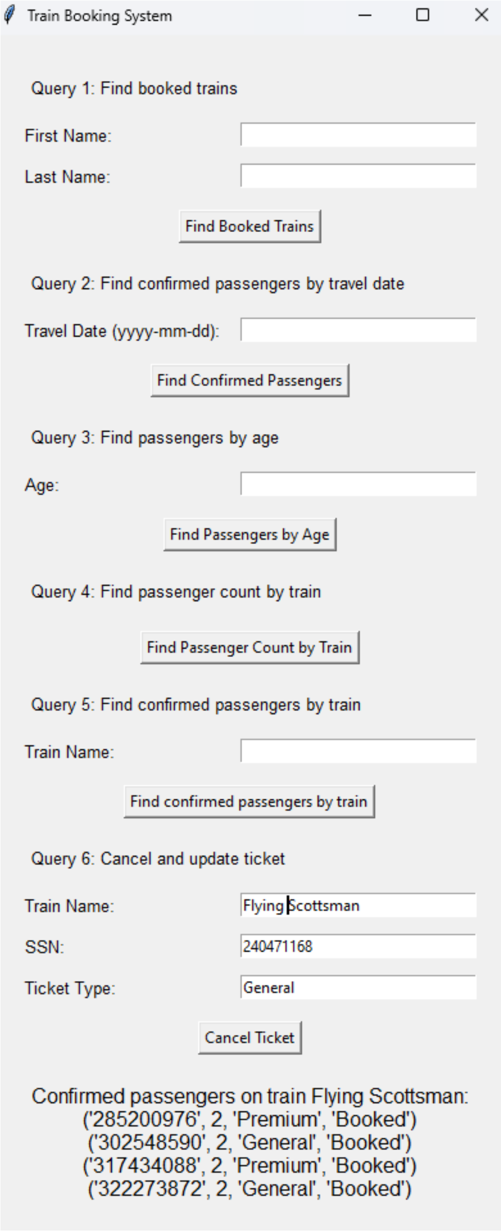
Query 5: Find confirmed passengers by train

Train Name: Golden Arrow

Confirmed passengers on train Golden Arrow:
Golden Arrow 1

- `show_cancel_train_ticket()`: This function is called when the user enters train name, passengers ssn, and ticket type into the GUI and clicks a "cancel ticket" button. It calls the `get_cancel_train_ticket()` function to cancel the respective ticket and allocate the ticket to the one who is in the waiting list.

  Output:


Train Booking System
Query 1: Find booked trains
First Name:
Last Name:
Find Booked Trains
Query 2: Find confirmed passengers by travel date
Travel Date (yyyy-mm-dd):
Find Confirmed Passengers
Query 3: Find passengers by age
Age:
Find Passengers by Age
Query 4: Find passenger count by train
Find Passenger Count by Train
Query 5: Find confirmed passengers by train
Train Name:
Find confirmed passengers by train
Query 6: Cancel and update ticket
Cancel Ticket

Train Name: Flying Scottsman
SSN: 240471168
Ticket Type: General

```
Confirmed passengers on train Flying Scottsman:
('285200976', 2, 'Premium', 'Booked')
('302548590', 2, 'General', 'Booked')
('317434088', 2, 'Premium', 'Booked')
('322273872', 2, 'General', 'Booked')
```