BITU 2913 WORKSHOP 1

Analysis & Design

Supervisor Name:

TS. DR. ABDUL SYUKOR MOHAMAD JAYA

Waleed Isskandar Almandari
## B032220031
BITI S1G1
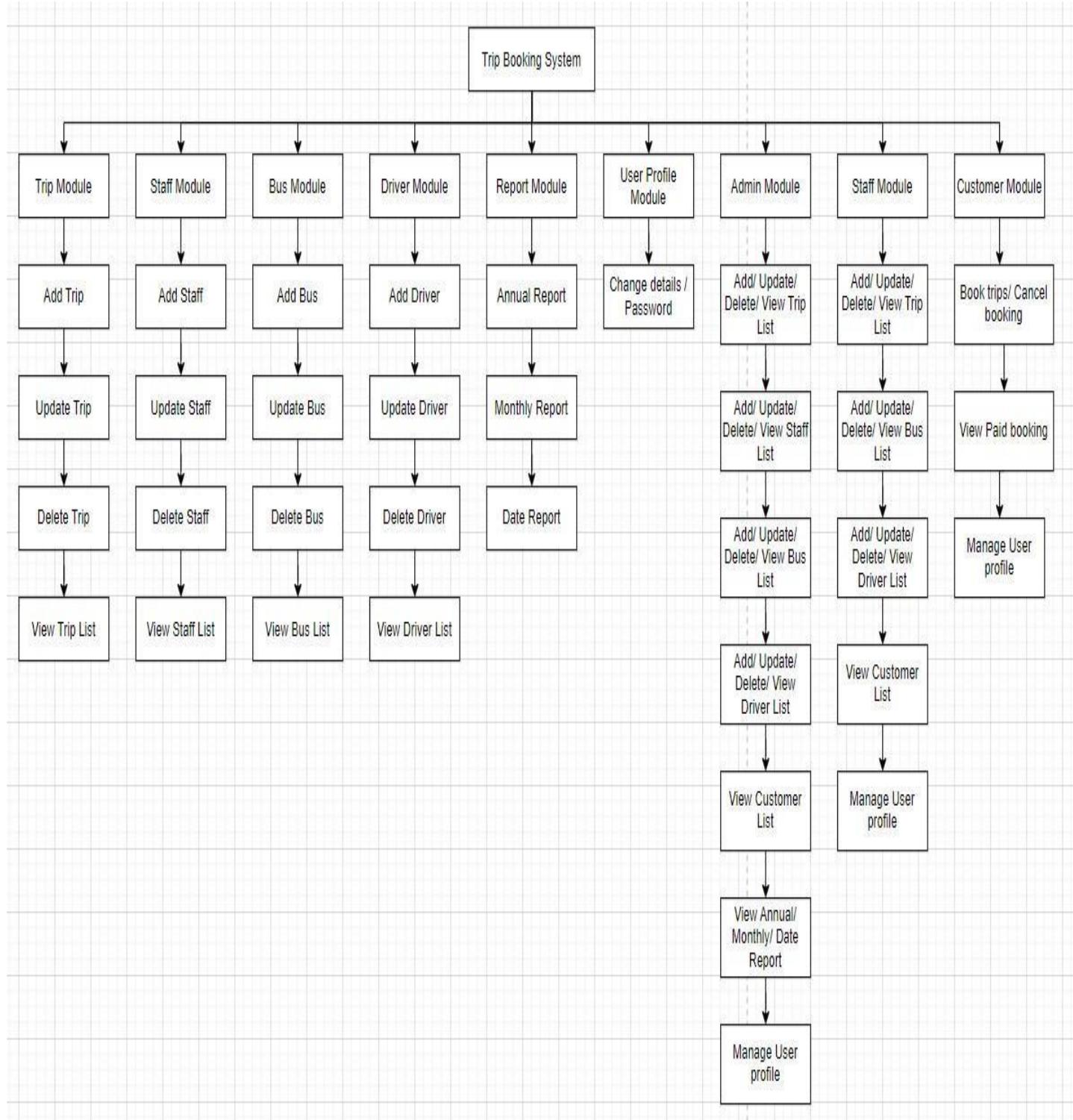
Problem Statement:

In Malaysia, the current bus booking systems face numerous challenges that make the process inconvenient and inefficient for passengers and operators alike. For passengers, navigating the booking platforms proves difficult due to their complex interfaces and lack of essential features. This complexity often leads to frustration as users struggle to find and book suitable trips. Additionally, the absence of real-time updates on seat availability and trip status further exacerbates the problem, making it hard for passengers to make informed decisions.

On the other hand, bus operators grapple with manual trip management processes that are labor-intensive and error-prone. Tasks such as adding, cancelling, and modifying trips, as well as allocating seats and scheduling, are often done manually, consuming valuable time and resources. Furthermore, the current systems lack adequate security measures to protect user data, leaving sensitive information vulnerable to unauthorized access and potential breaches.
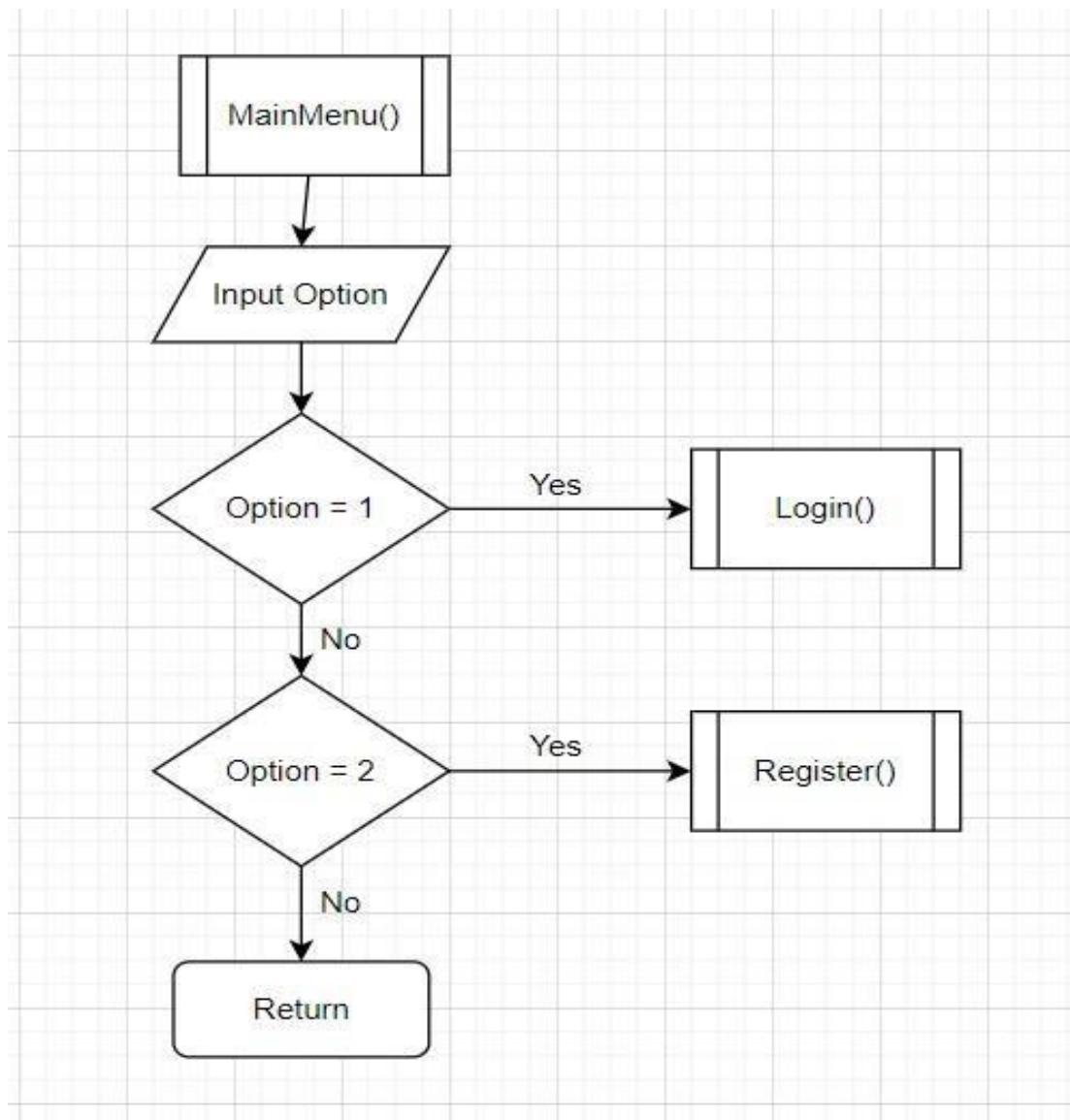
These challenges collectively hinder the smooth operation of the transportation sector in Malaysia, impacting user satisfaction and operational efficiency. There is a clear need for a new bus booking system that addresses these issues comprehensively. Such a system should provide passengers with a user-friendly interface, real-time updates on trip availability, and robust security measures. For operators, it should offer automated tools for trip management and data protection. By addressing these challenges, we can significantly improve the travel experience for both passengers and operators in Malaysia.

Structured Chart:


```
                              Trip Booking System
    ┌─────────┬─────────┬─────────┬─────────┬─────────┬─────────┬─────────┬─────────┐
 Trip Module  Staff    Bus      Driver   Report   User     Admin    Staff    Customer
              Module   Module   Module   Module   Profile  Module   Module   Module
                                                  Module
```

Trip Module	Staff Module	Bus Module	Driver Module	Report Module	User Profile Module	Admin Module	Staff Module	Customer Module
Add Trip	Add Staff	Add Bus	Add Driver	Annual Report	Change details / Password	Add/ Update/ Delete/ View Trip List	Add/ Update/ Delete/ View Trip List	Book trips/ Cancel booking
Update Trip	Update Staff	Update Bus	Update Driver	Monthly Report		Add/ Update/ Delete/ View Staff List	Add/ Update/ Delete/ View Bus List	View Paid booking
Delete Trip	Delete Staff	Delete Bus	Delete Driver	Date Report		Add/ Update/ Delete/ View Bus List	Add/ Update/ Delete/ View Driver List	Manage User profile
View Trip List	View Staff List	View Bus List	View Driver List			Add/ Update/ Delete/ View Driver List	View Customer List	
						View Customer List	Manage User profile	
						View Annual/ Monthly/ Date Report		
						Manage User profile		

Flowchart:

Main Page:

Login:
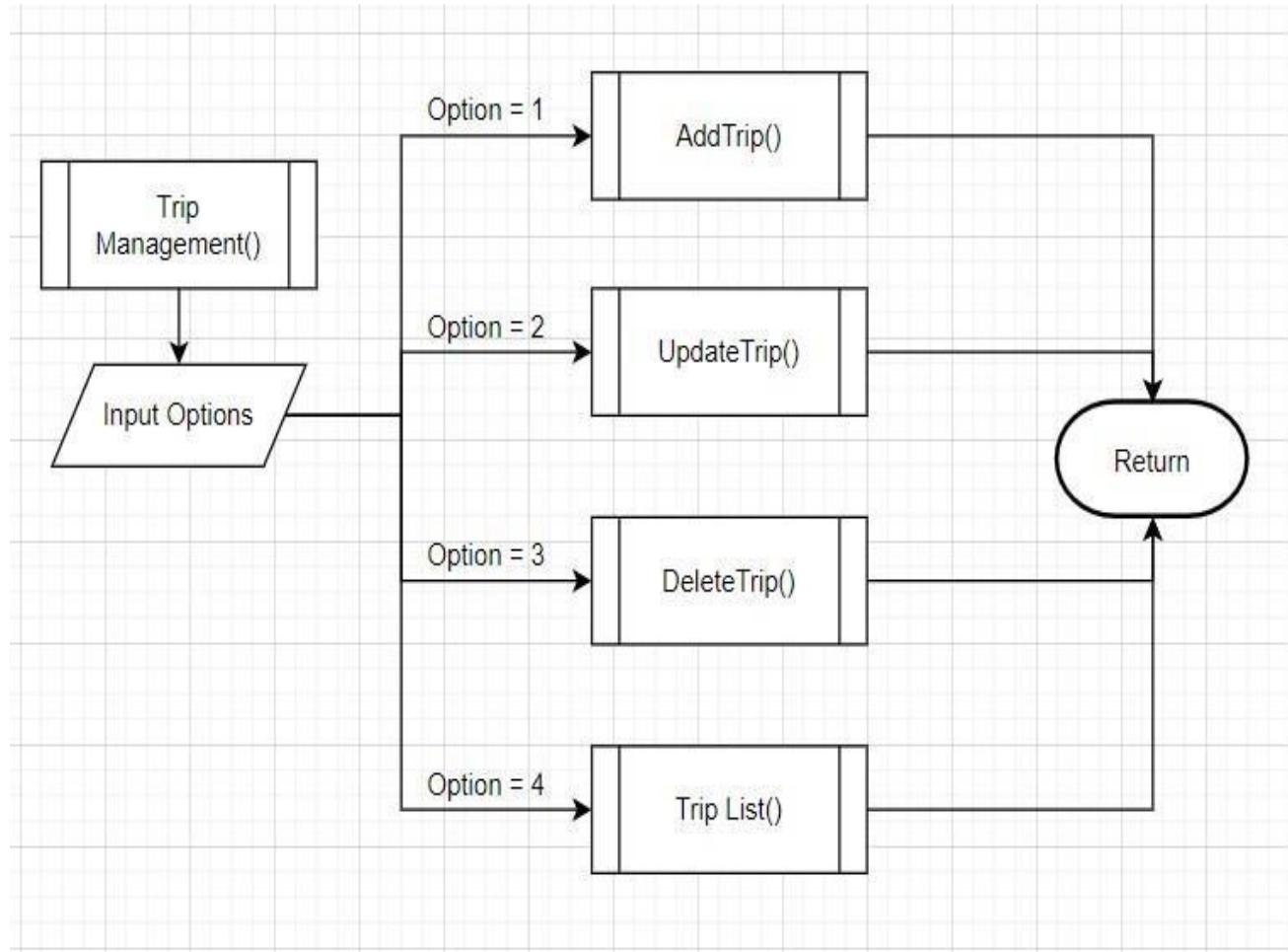
**Register:**
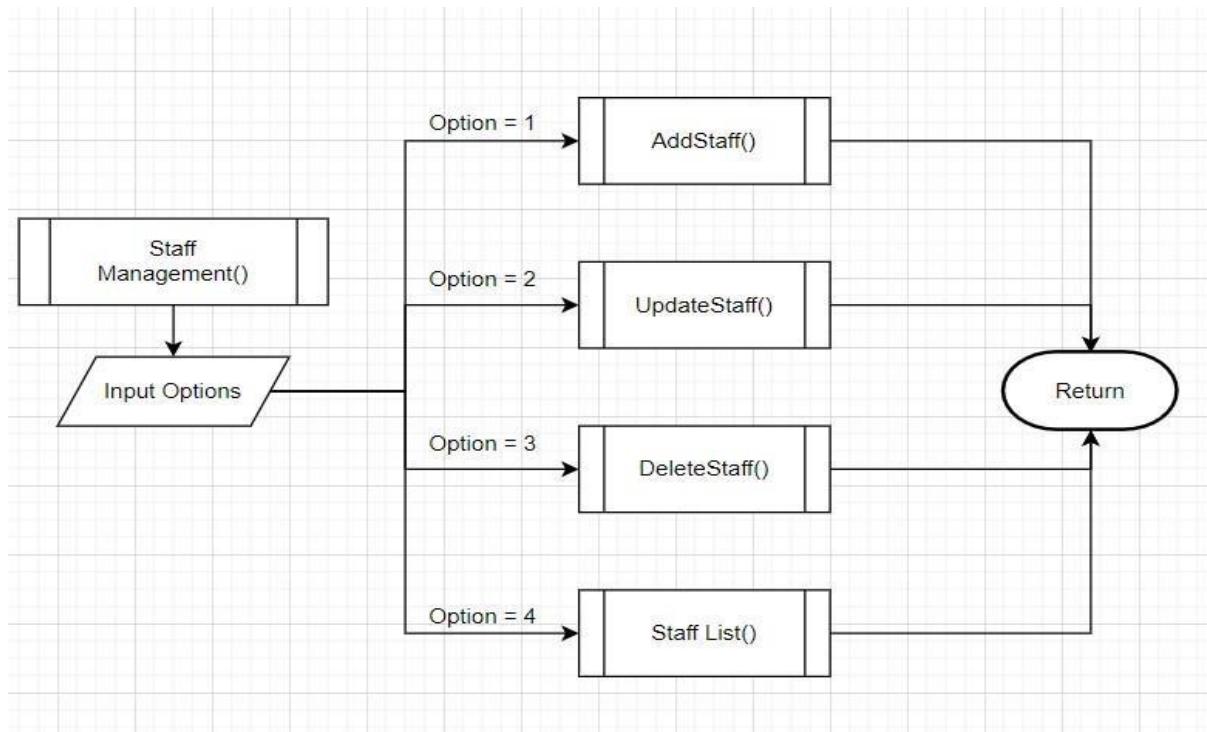
Admin Menu:

Staff Menu:
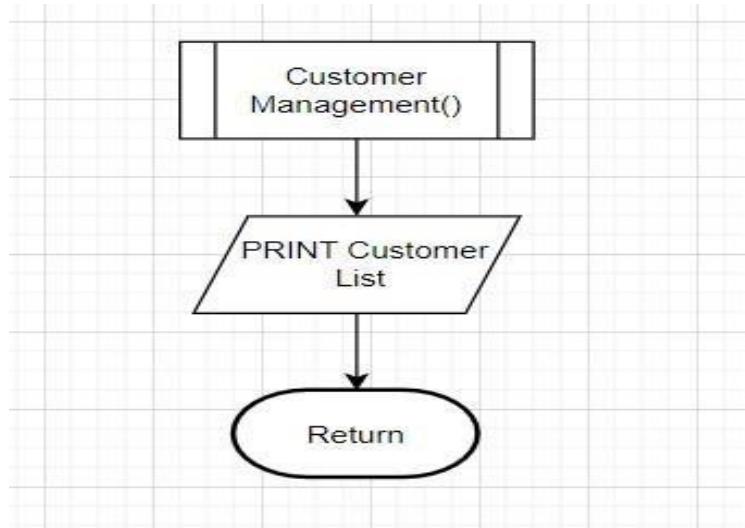
**Customer Menu:**
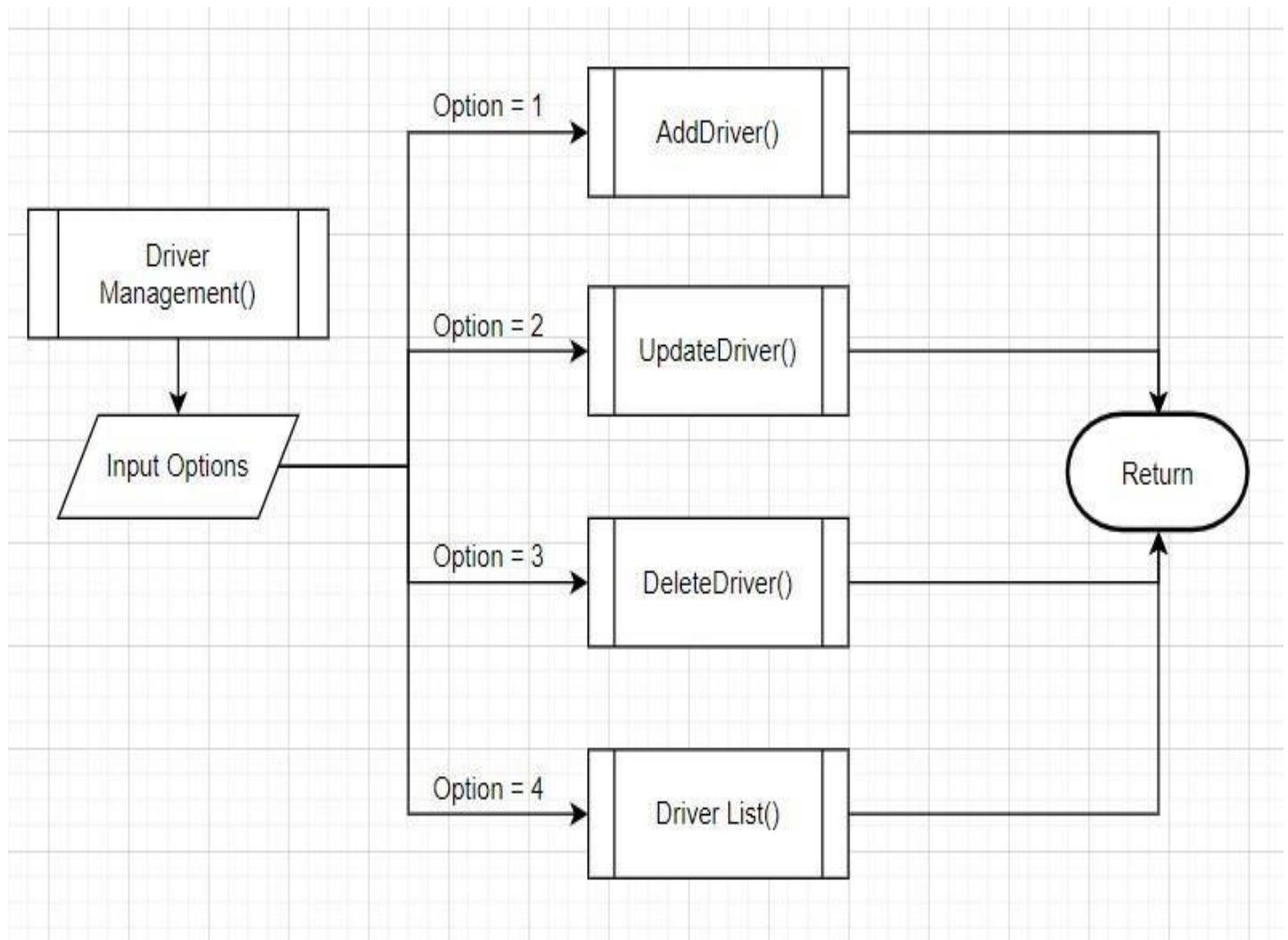
Trip Management for Admin:
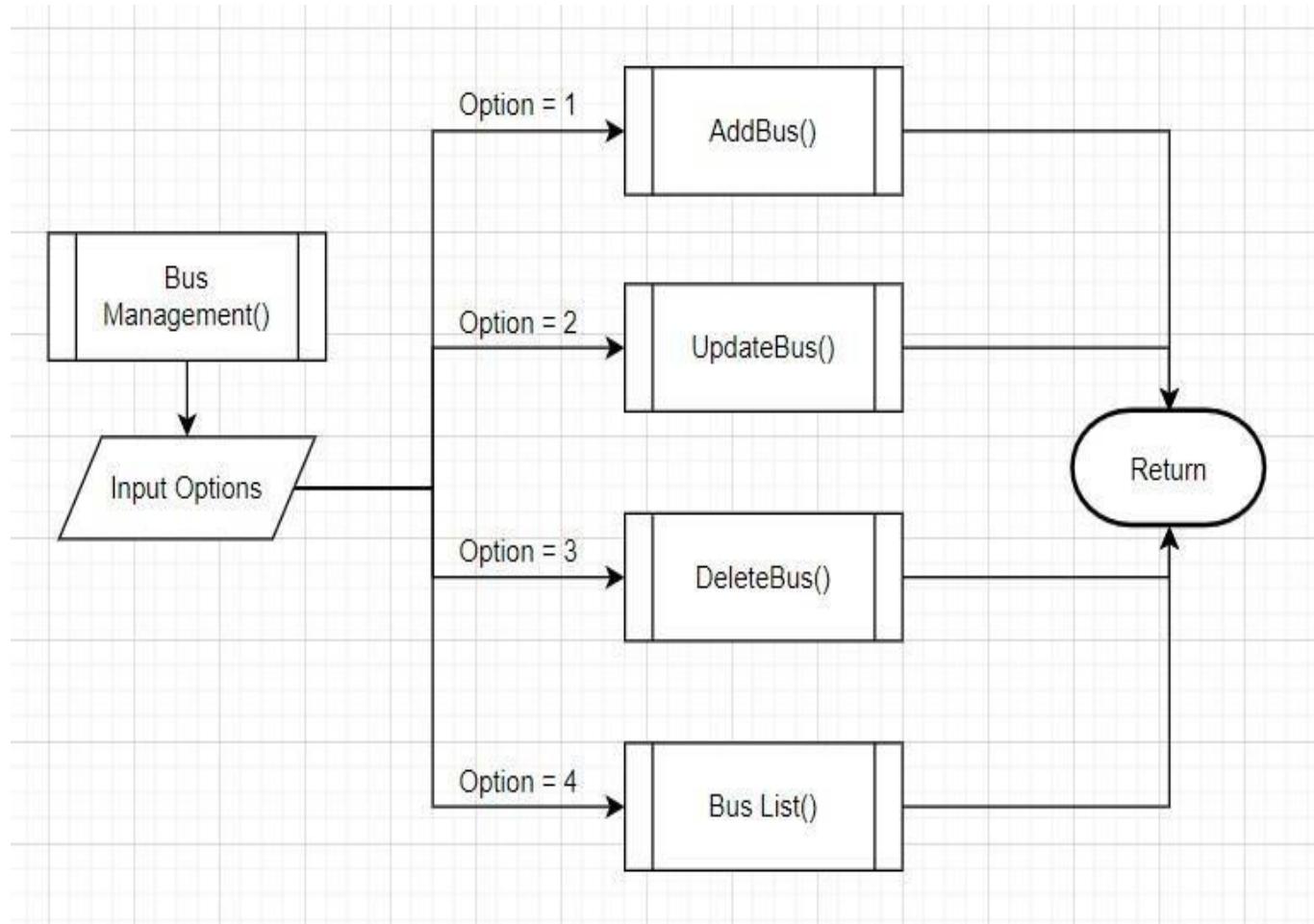
Staff Management:
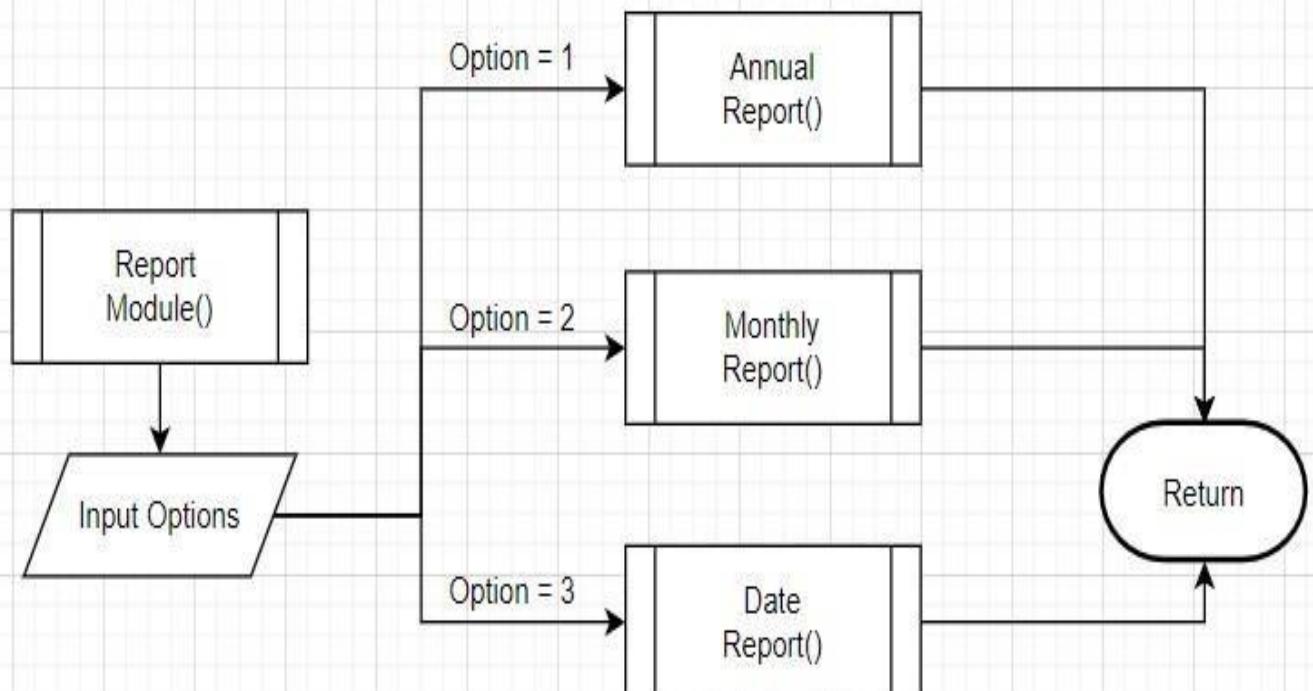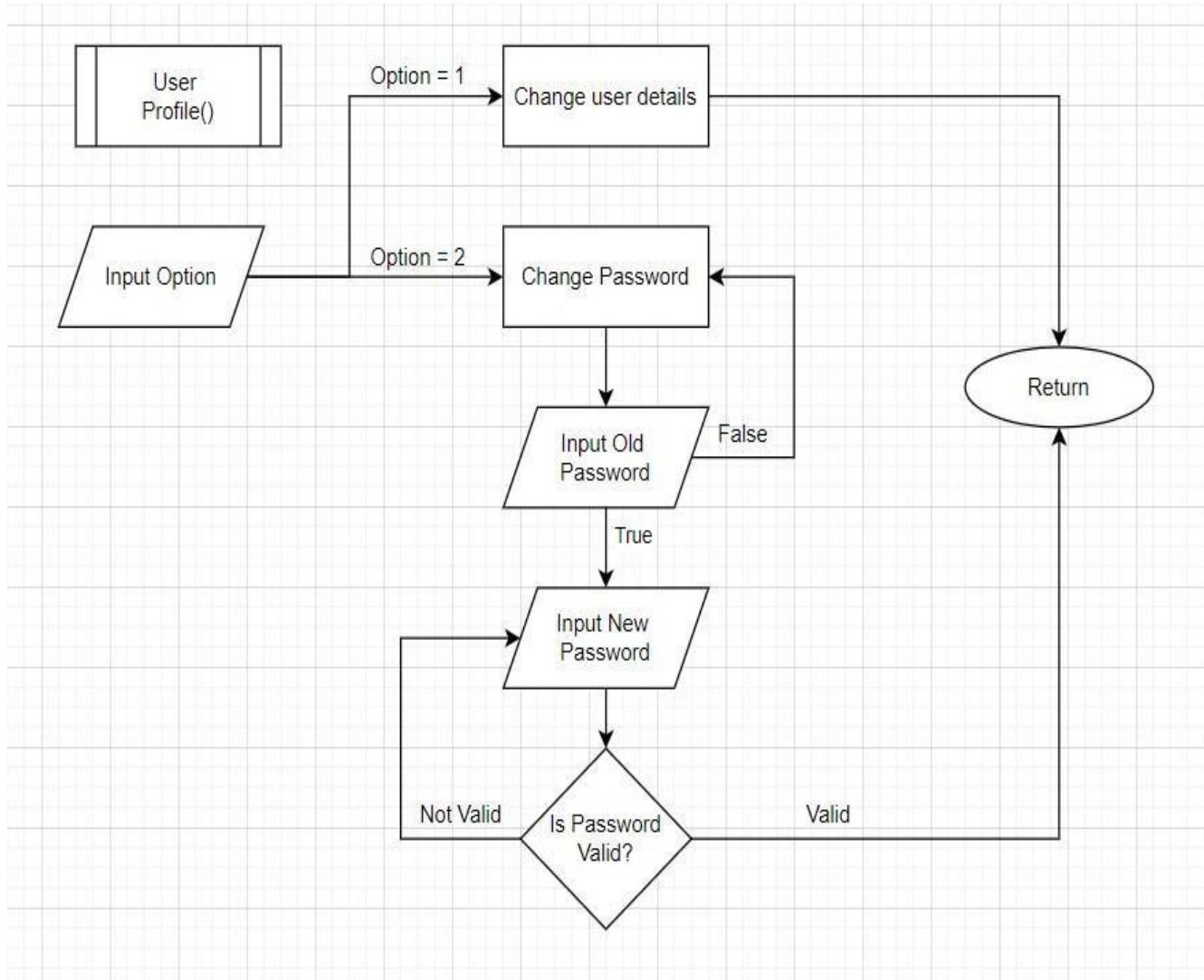
Customer Management:
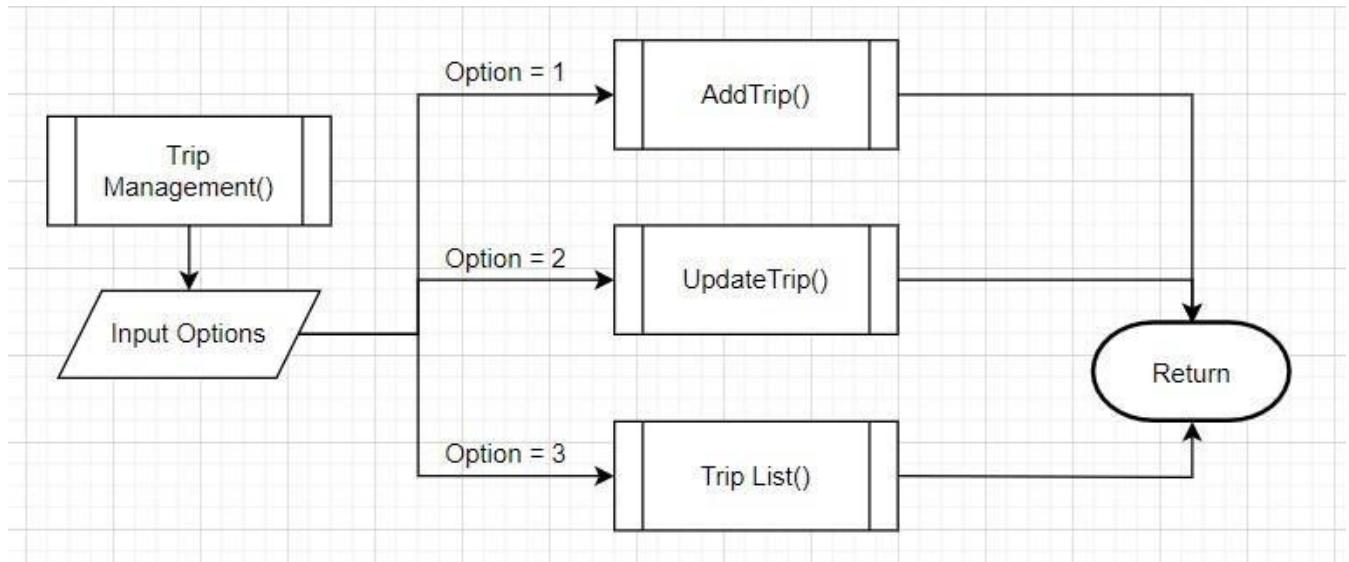
Driver Management for Admin:

Bus Management for Admin:
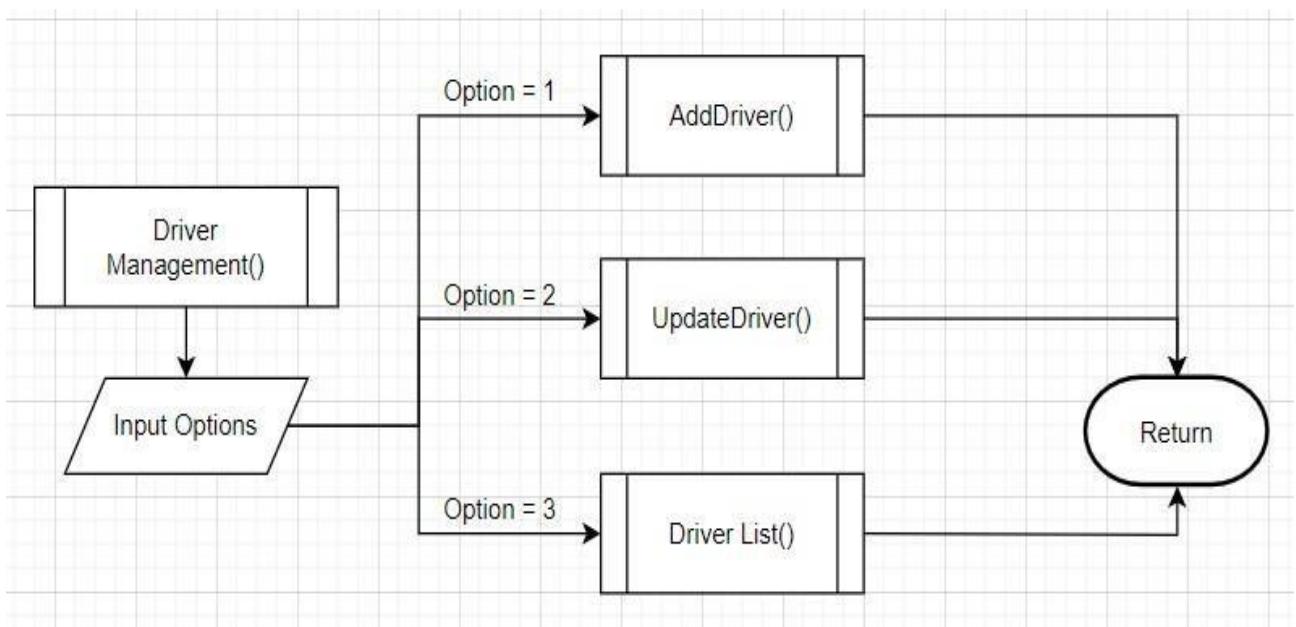
Report Module:

User Profile:
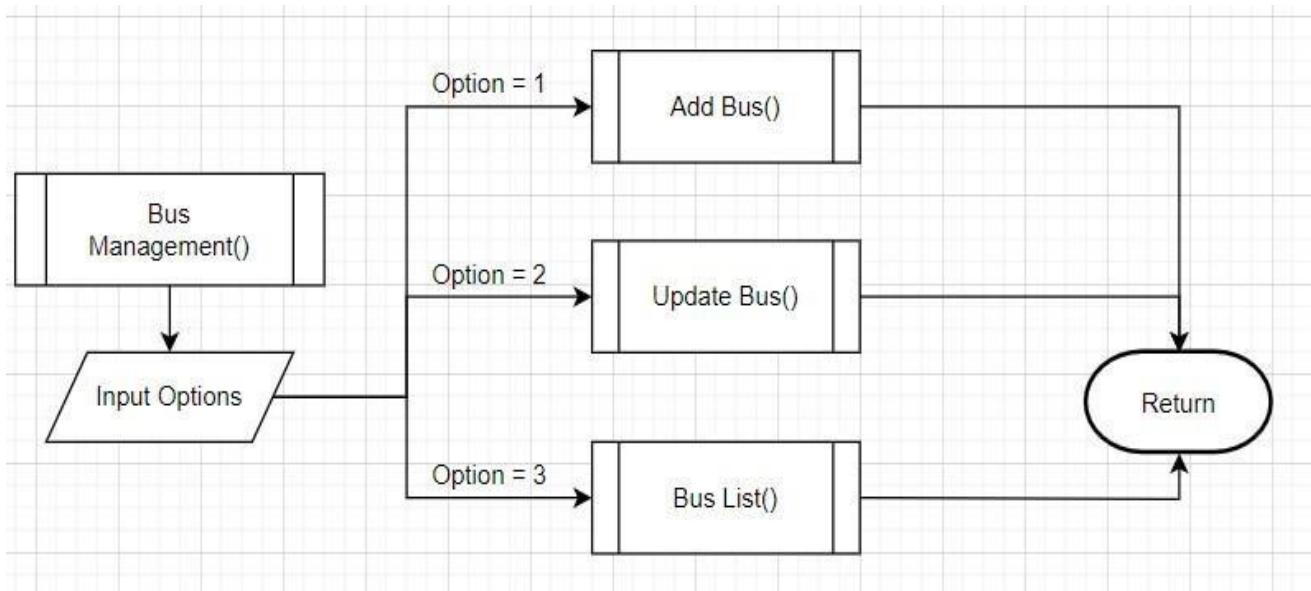
Trip Management for Staff:
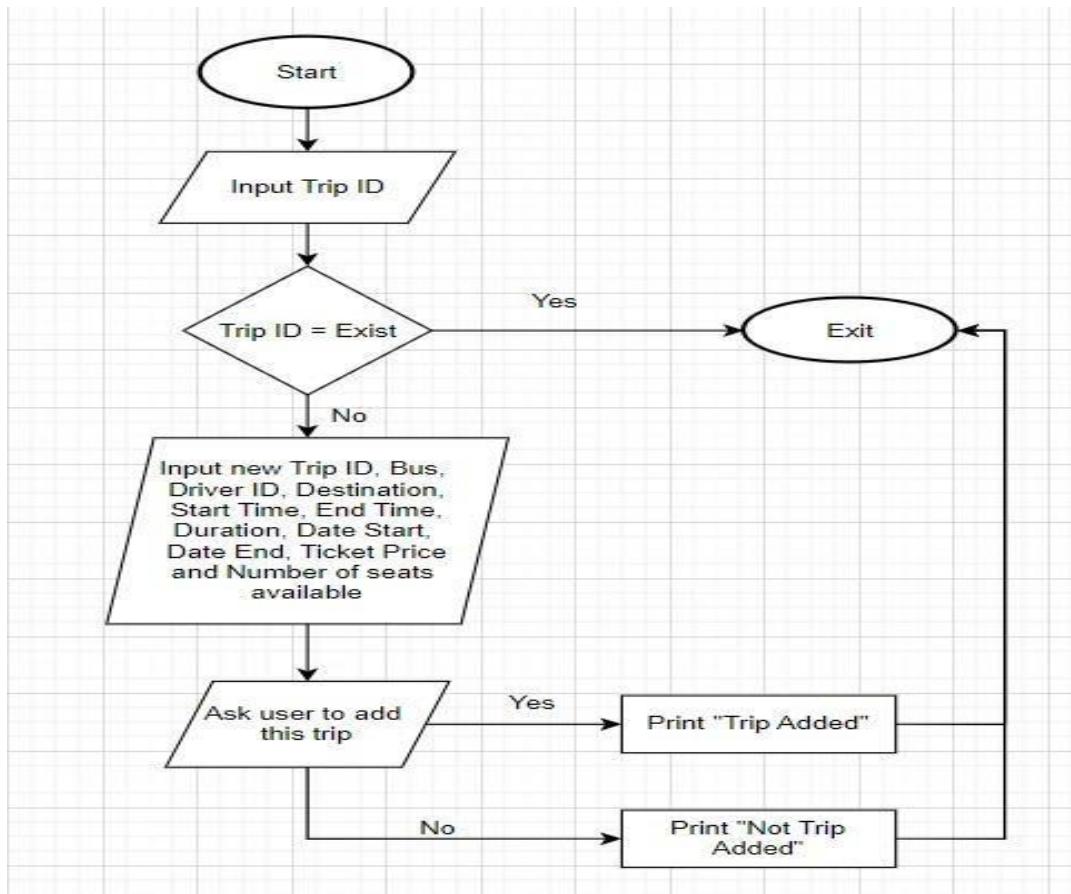
Driver Management for Staff:
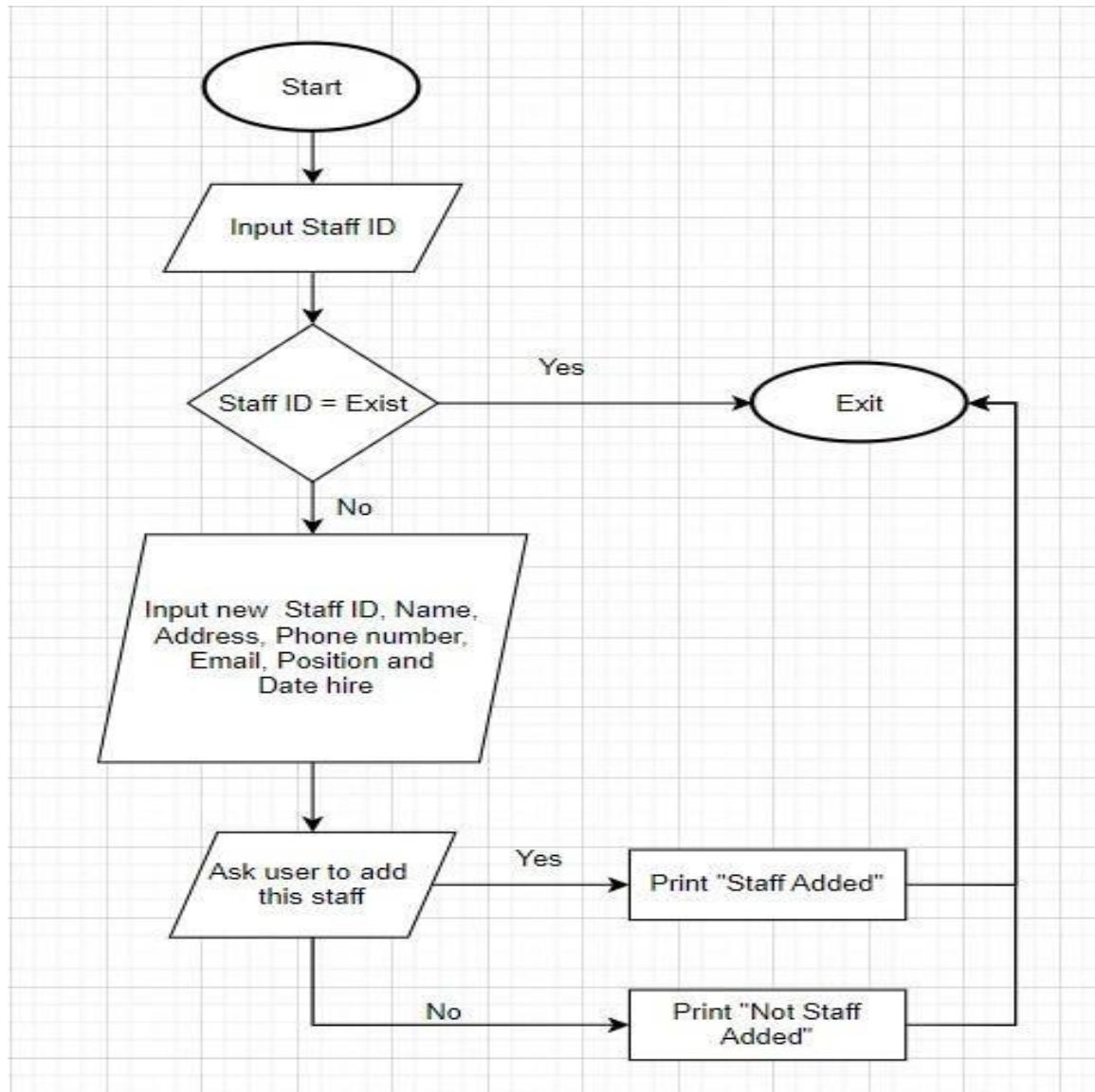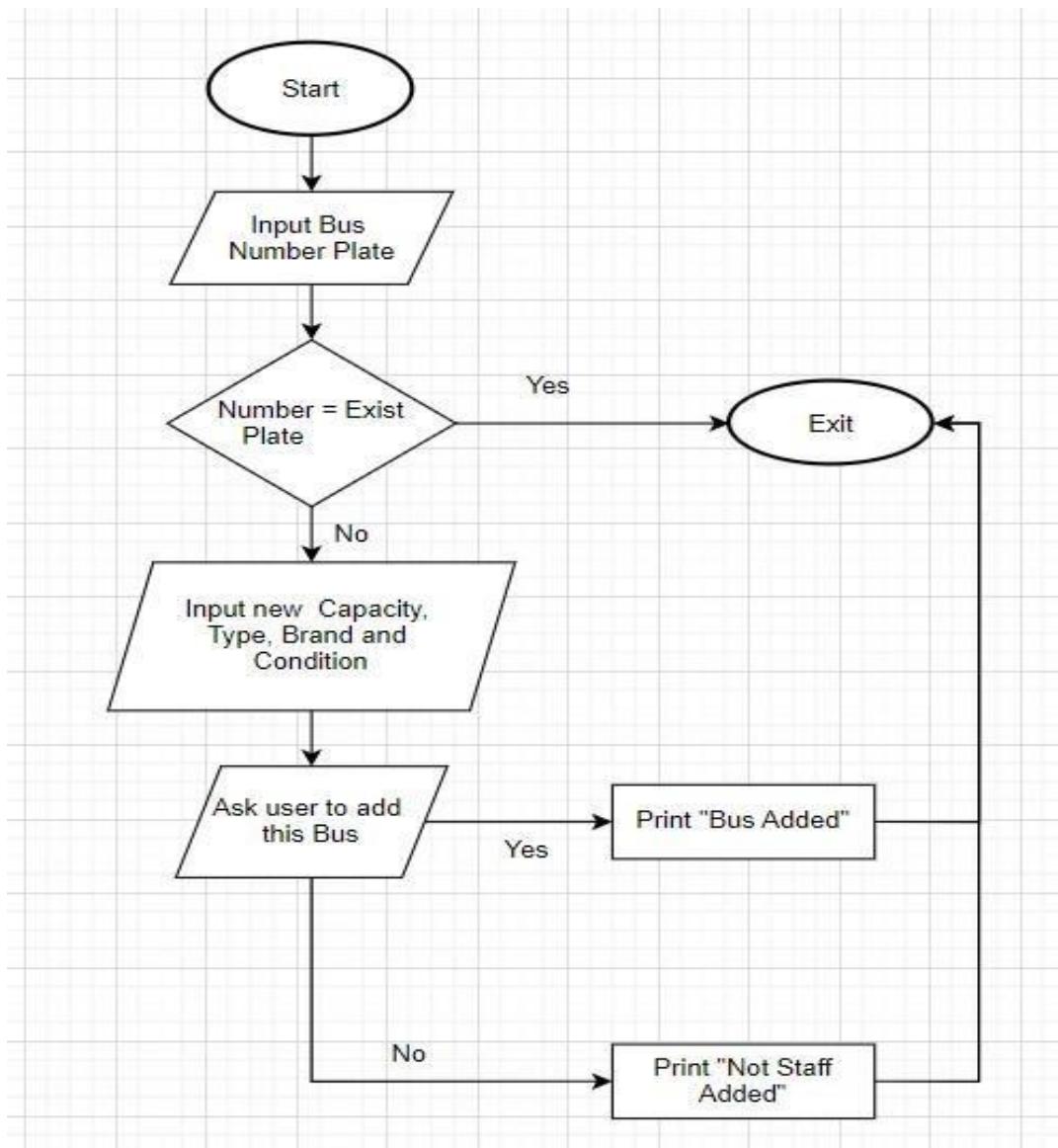
Bus Management for Staff:
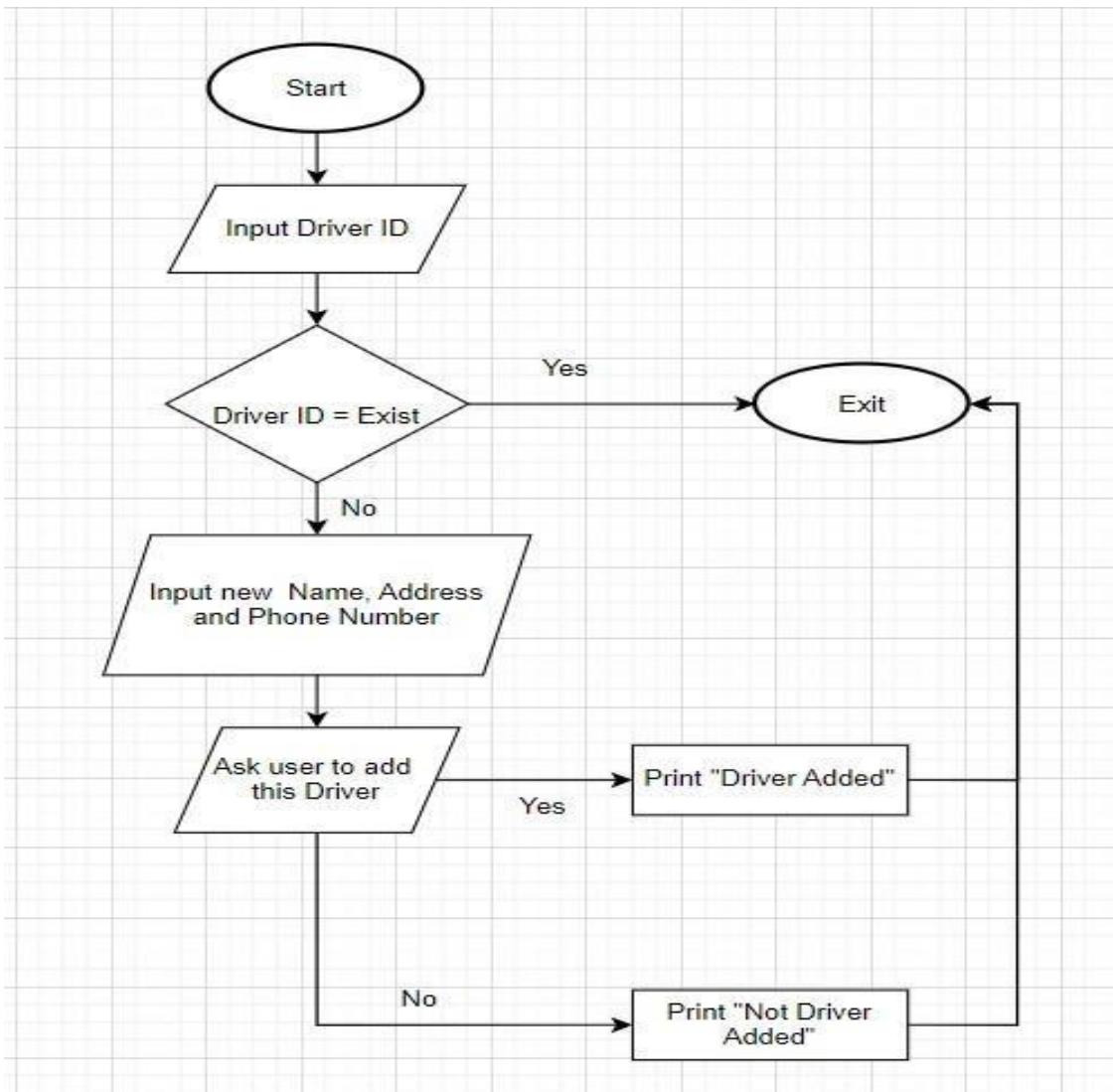

Add Trip:
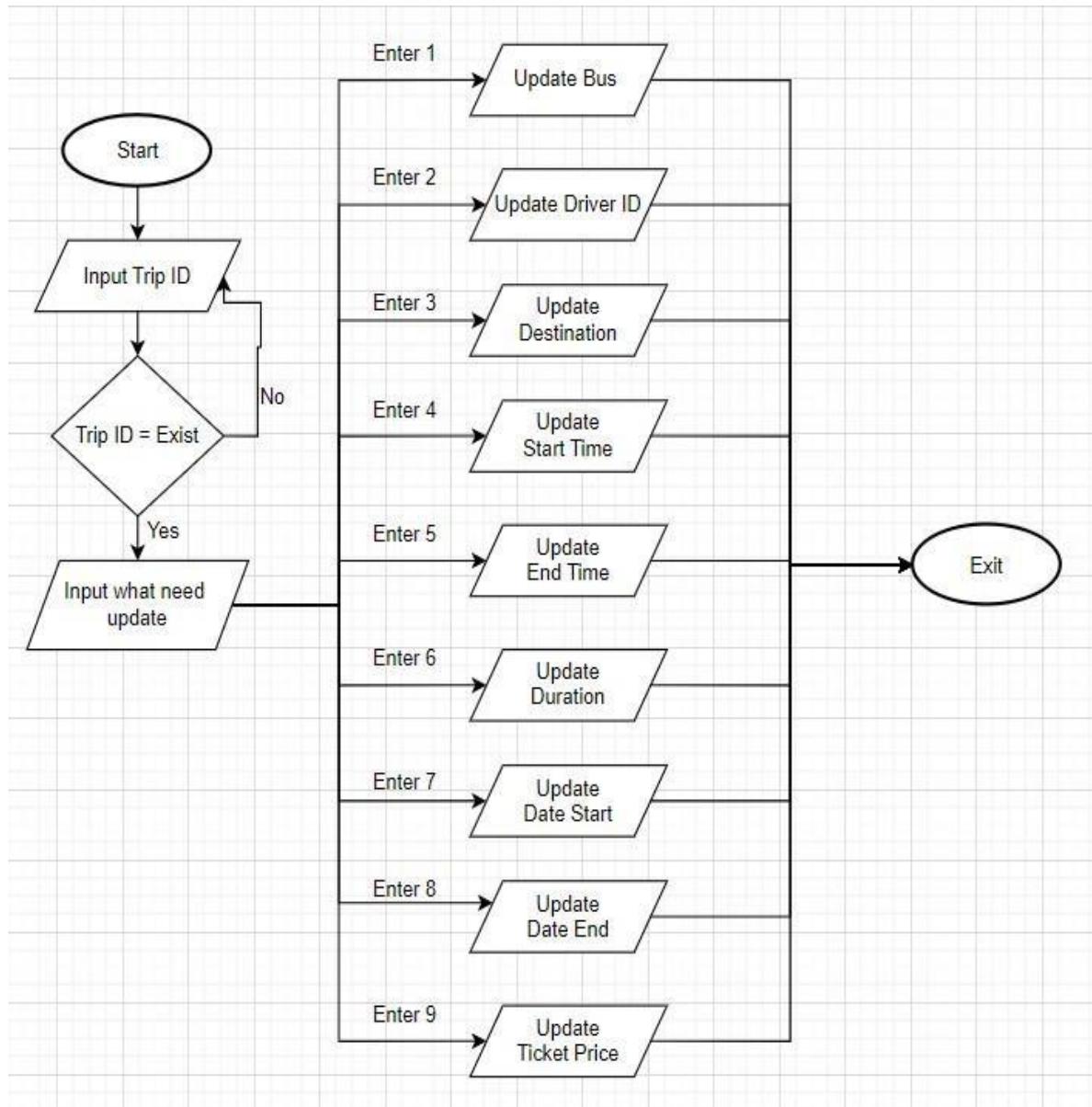
Add Staff:
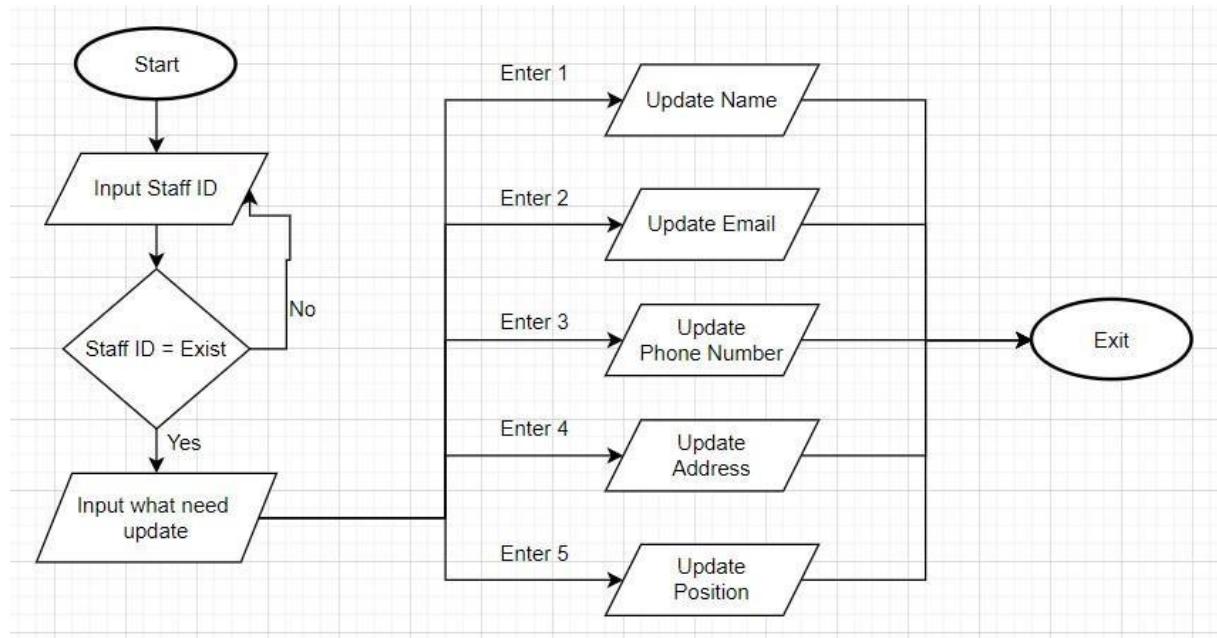
Add Bus:

Add Driver:
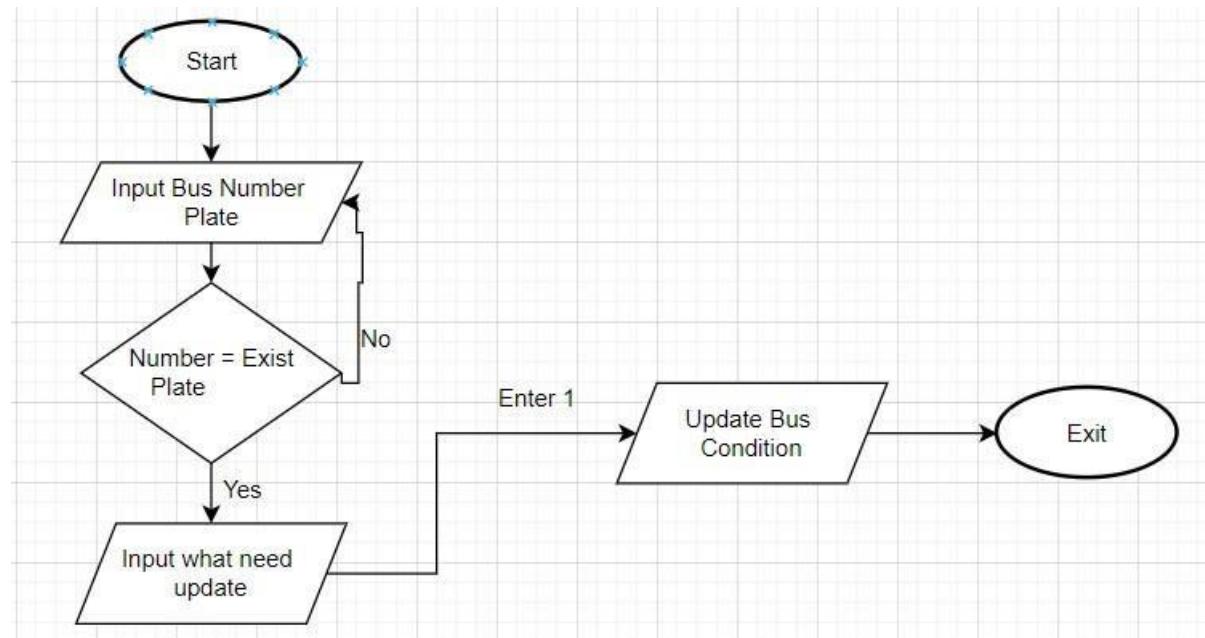
Update Trip:
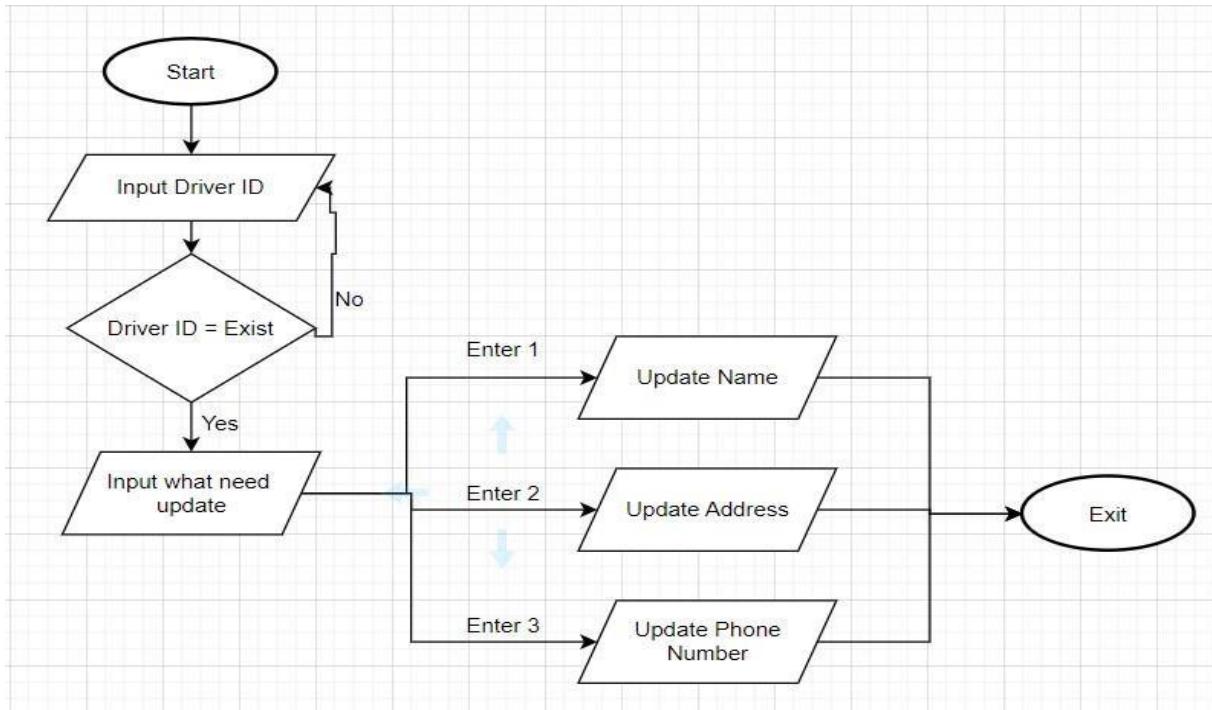
Update Staff:
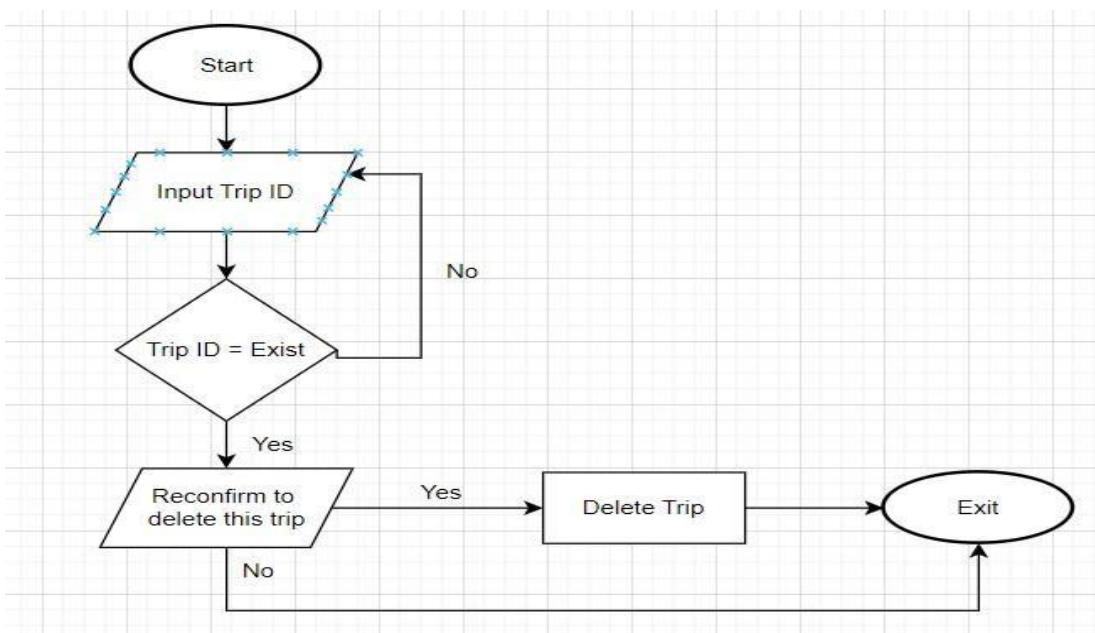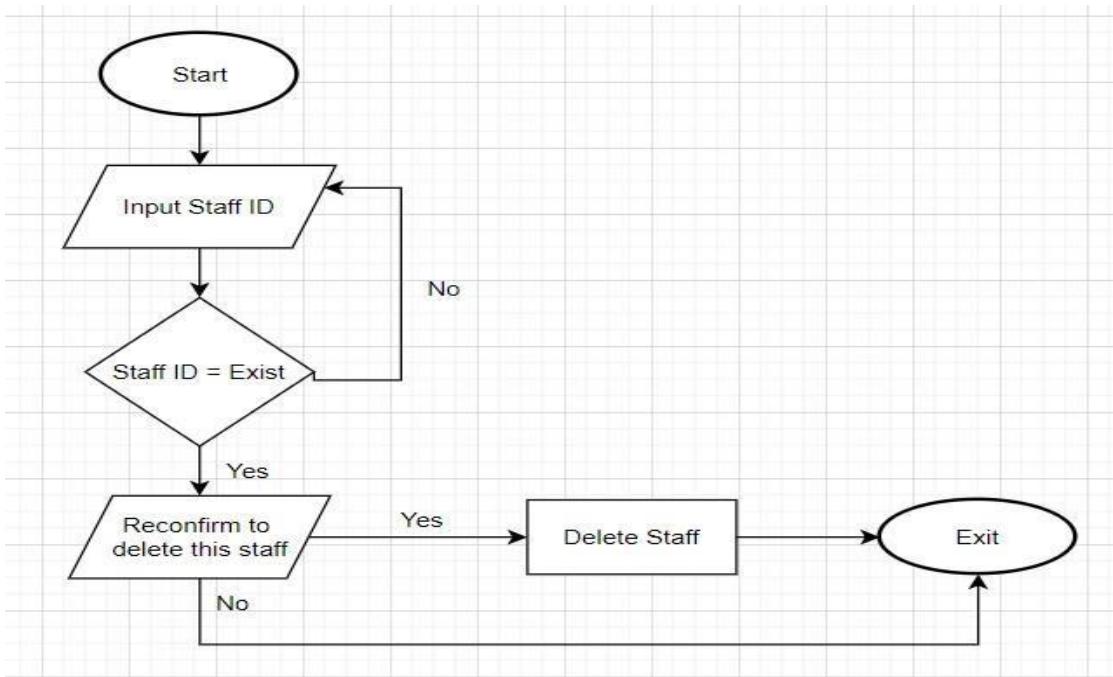
Update Bus:

Update Driver:
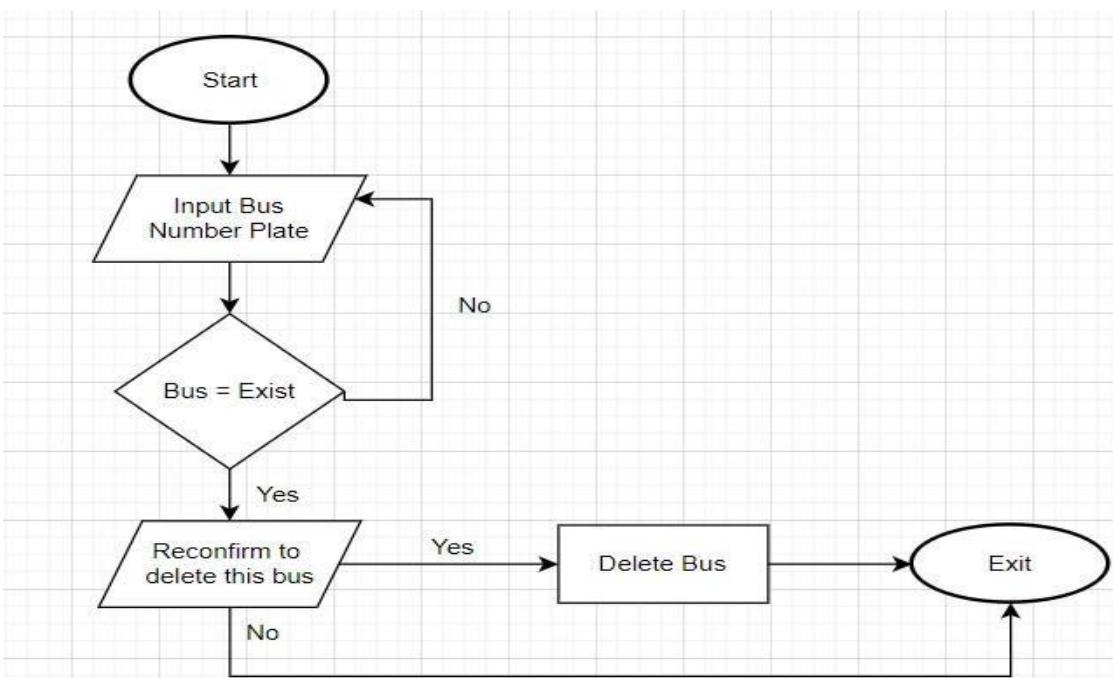
Delete Trip:
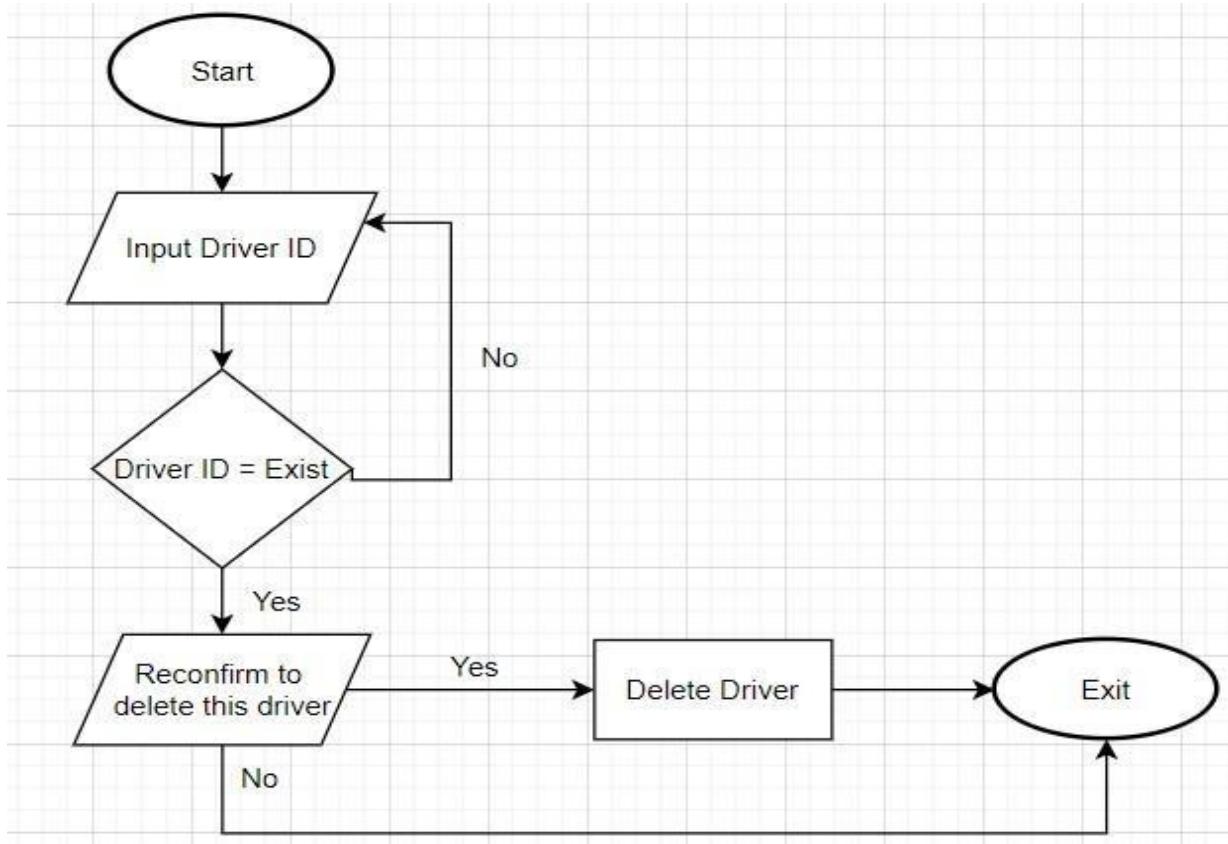
Delete Staff:
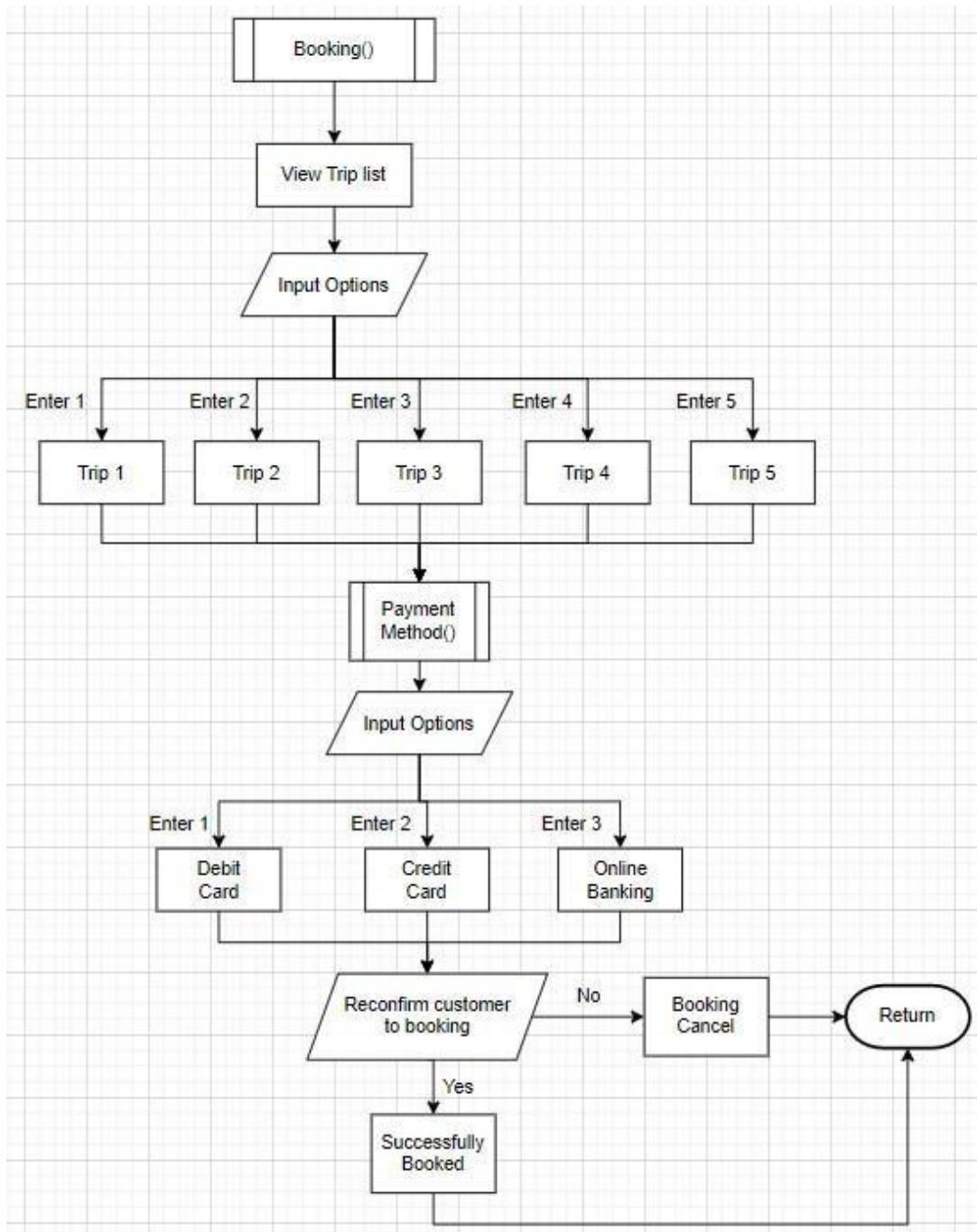
Delete Bus:

Delete Driver:
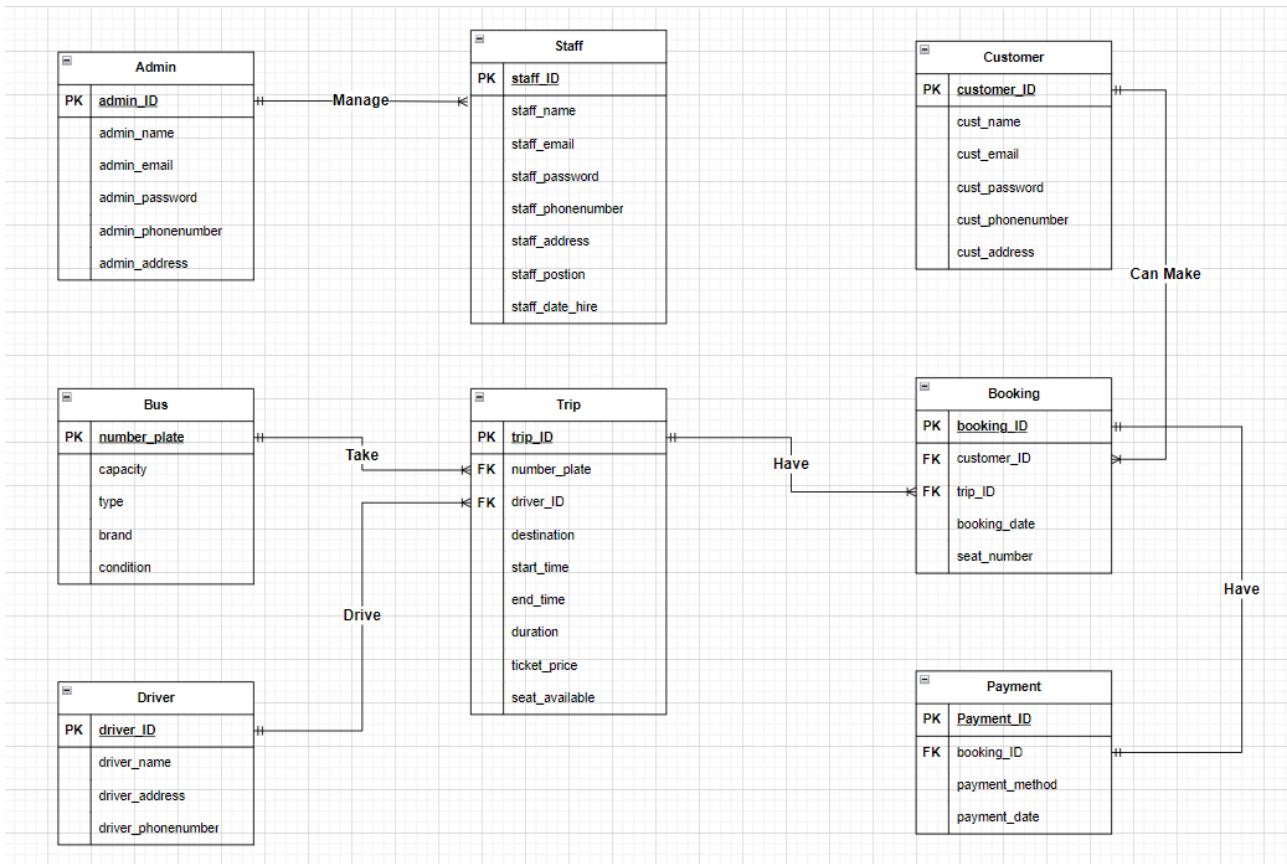
Booking:

Business Rule:

- Customers:
  - A customer can only have one booking at a time.
  - A customer can make multiple payments.
- Staff:
  - A staff member managed by an admin.
- Admin:
  - An admin can manage many staff members.
- Trips:
  - A trip can only have one bus assigned to it.
  - A trip must have a driver.
  - A trip can have many bookings.
- Bus:
  - A bus can take multiple trips.
- Bookings:
  - A booking can only be for one trip.
  - A booking can only be made by one customer.
  - A booking must have a seat number assigned.
- Payments:
  - A payment can only be for one booking.
- Driver:
  - A driver can drive many trips.

ERD:

Data Dictionary

1. **Admin Menu**

ATTRIBUTE NAME	CONTENT	DATA TYPE	UNIQUE	PRIMARY KEY (PK)/ FOREIGN KEY (FK)
admin_ID	Admin ID	VARCHAR (25)	YES	PK
admin_name	Admin Name	VARCHAR (45)	-	-
admin_email	Admin Email	VARCHAR (45)	YES	-
admin_password	Admin Password	VARCHAR (45)	-	-
admin_phonenumber	Admin Phone Number	VARCHAR (20)	-	-
admin_address	Admin Address	VARCHAR (255)	-	-

2. **Staff Menu**

ATTRIBUTE NAME	CONTENT	DATA TYPE	UNIQUE	PRIMARY KEY (PK)/ FOREIGN KEY (FK)
staff_ID	Staff ID	VARCHAR (25)	YES	PK
staff_name	Staff Name	VARCHAR (45)	-	-
staff_email	Staff Email	VARCHAR (45)	YES	-
staff_password	Staff Password	VARCHAR (45)	-	-
staff_address	Staff House Address	VARCHAR (255)	-	-
staff_phonenumber	Staff Phone Number	VARCHAR (20)	-	-
staff_position	Staff position	VARCHAR(45)	-	-
staff_date_hire	Date Hire	DATE	-	-

3. **Customer Menu**

ATTRIBUTE NAME	CONTENT	DATA TYPE	UNIQUE	PRIMARY KEY (PK)/ FOREIGN KEY (FK)
customer_ID	Customer ID	VARCHAR (25)	YES	PK
cust_name	Customer Name	VARCHAR (45)	-	-
cust_email	Customer Email	VARCHAR (45)	YES	-
cust_password	Customer Password	VARCHAR (45)	-	-
cust_address	Customer Address	VARCHAR (255)	-	-
cust_phonenumber	Customer Phone Number	VARCHAR (20)	-	-

4. **Trip**

ATTRIBUTE NAME	CONTENT	DATA TYPE	UNIQUE	PRIMARY KEY (PK)/ FOREIGN KEY (FK)
trip_ID	Trip ID	VARCHAR (25)	YES	PK
number_plate	Number Plate	VARCHAR (25)	-	FK
driver_ID	Driver ID	VARCHAR (45)	-	FK
destination	Destination	VARCHAR (45)	-	-
start_time	Start Time	VARCHAR (25)	-	-
end_time	End Time	VARCHAR (25)	-	-
duration	Duration (Hour/Day)	VARCHAR (45)	-	-
ticket_price	Ticket Price (RM)	INT	-	-

seat_available	Seat Available	INT	-	-

5. Bus

ATTRIBUTE NAME	CONTENT	DATA TYPE	UNIQUE	PRIMARY KEY (PK)/ FOREIGN KEY (FK)
number_plate	Number Plate	VARCHAR (25)	YES	PK
capacity	Capacity (Seats)	INT	-	-
type	Type	VARCHAR (50)	-	-
brand	Brand	VARCHAR (45)	-	-
condition	Condition	VARCHAR (45)	-	-

6. Driver

ATTRIBUTE NAME	CONTENT	DATA TYPE	UNIQUE	PRIMARY KEY (PK)/ FOREIGN KEY (FK)
driver_ID	Driver ID	VARCHAR (25)	YES	PK
driver_name	Driver Name	VARCHAR (45)	-	-
driver_address	Driver Address	VARCHAR (255)	-	-
driver_phonenumber	Driver Phone Number	VARCHAR (20)	-	-

7. Booking

ATTRIBUTE NAME	CONTENT	DATA TYPE	UNIQUE	PRIMARY KEY (PK)/ FOREIGN KEY (FK)
booking_ID	Booking ID	VARCHAR (50)	YES	PK
customer_ID	Customer ID	VARCHAR (25)	-	FK
trip_ID	Trip ID	VARCHAR (25)	-	FK
booking_date	Booking Date	DATE	-	-
seat_number	Seat Number	VARCHAR (45)		

8. Payment

ATTRIBUTE NAME	CONTENT	DATA TYPE	UNIQUE	PRIMARY KEY (PK)/ FOREIGN KEY (FK)
payment_ID	Payment ID	VARCHAR (25)	YES	PK
booking_ID	Booking ID	VARCHAR (50)	YES	FK
payment_method	Payment Method	VARCHAR (45)	-	-
payment_date	Payment Date	DATE	-	-

Pseudocode:

// Function Declarations
function registerUser()
function loginUser()
function viewTrips()
function bookTrip(trip_id)
function cancelBooking(booking_id)
function viewCustomerBookings(customer_id)
function addTrip(bus_id, driver_id, departure_date, arrival_date, destination)
function updateTrip(trip_id, bus_id, driver_id, departure_date, arrival_date, destination)
function deleteTrip(trip_id)
function addStaff(name, position)
function updateStaff(staff_id, name, position)
function deleteStaff(staff_id)
function addBus(plate_number, capacity)
function updateBus(bus_id, plate_number, capacity)
function deleteBus(bus_id)
function addDriver(name, license_number)
function updateDriver(driver_id, name, license_number)
function deleteDriver(driver_id)
function generateReport(type) // type could be "Daily", "Monthly", or "Yearly"

// Main Menu Loop
Loop:
  Display Menu:
    - Register User
    - Login User
    - View Trips
    - Book Trip
    - Cancel Booking (For logged-in customer)
    - View Bookings (For logged-in customer)
    - Add Trip (For Admin)
    - Update Trip (For Admin)
    - Delete Trip (For Admin)
    - Add Staff (For Admin)
    - Update Staff (For Admin)
    - Delete Staff (For Admin)
    - Add Bus (For Admin)
    - Update Bus (For Admin)
    - Delete Bus (For Admin)
    - Add Driver (For Admin)
    - Update Driver (For Admin)
    - Delete Driver (For Admin)
    - Generate Report (For Admin)
    - Exit
  Read user choice (option)

  Case option:
    - "Register User": Call registerUser()
    - "Login User": Call loginUser()
      - If login successful:
        Set logged_in_customer_id (if applicable)
        Show customer menu or admin menu based on user role
      - Else:
        Display error message and return to main menu
    - "View Trips": Call viewTrips()

- *"Book Trip":*
  - *Prompt for trip ID*
  - *Call bookTrip(trip_id)*
  - *Display success or error message*
- *"Cancel Booking":*
  - *If customer is logged in:*
    Call viewCustomerBookings(logged_in_customer_id) to display bookable options
  - *Prompt for booking ID*
  - *Call cancelBooking(booking_id)*
  - *Display success or error message*
- *"View Bookings":*
  - *If customer is logged in:*
    Call viewCustomerBookings(logged_in_customer_id)
  - *Else:*
    Display message "Please login to view bookings"
- *"Add Trip", "Update Trip", "Delete Trip", "Add Staff", "Update Staff", "Delete Staff", "Add Bus", "Update Bus", "Delete Bus", "Add Driver", "Update Driver", "Delete Driver":*
  - *Only allow if user is logged in as Admin*
  - *Call corresponding function with appropriate parameters*
  - *Display success or error message*
- *"Generate Report":*
  - *Only allow if user is logged in as Admin*
  - *Prompt for report type ("Daily", "Monthly", or "Yearly")*
  - *Call generateReport(type)*
  - *Display report*
- *"Exit": Exit Loop*