SOMAIYA VIDYAVIHAR UNIVERSITY

K J Somaiya College of Engineering

CAR RENTAL SYSTEM

A java-based Mini Project

Group A1_5 EXCP

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INTRODUCTION

The **Car Rental System** is an application designed to automate the process of renting and returning cars. It allows customers to select a car based on type (Hatchback, Sedan, SUV), input rental duration, and calculate the total rental price. The system tracks available cars, handles customer details, and ensures only available cars can be rented or returned. Additionally, the application provides a user-friendly graphical interface to facilitate the rental process, including options for feedback after returning a car. The system is aimed at simplifying car rental operations for both customers and rental service providers.

OBJECTIVE

The **objective** of this project is to automate the car rental process by managing inventory, customer details, bookings, and payments efficiently. Our system allows customers to rent different types of cars—like Hatchbacks, Sedans, and SUVs—for various durations. The goal is to streamline the process while applying Object-Oriented Programming principles.

OOP PRINCIPLES APPLIED

Inheritance: Abstract **Car** class with subclasses for **Hatchback, Sedan,** and **SUV.**

Encapsulation: Protecting data like car registration numbers and customer details.

Polymorphism: Different car types using the same **rent()** and **returnItem()** methods with customized behavior.

Interface Implementation: Rentable interface for ensuring consistent behavior across car types.

CODE FUNCTIONALITY

1.Car and Customer Management:

- The program maintains a list of available cars and registered customers. Each car has attributes like carRegistrationNumber, brand, model, type, basePricePerDay, and availability status.

- Customers are added with a unique customerId and their name.

2.Renting a Car:

- When the user selects "Rent a Car", they enter their name, choose a car type (Hatchback, Sedan, or SUV), and select an available car from a dropdown.
- The user then specifies how many days they want to rent the car. The total rental price is calculated based on the car's daily rate.
- If the user confirms the rental, the car's availability is set to false (it is rented), and a new Rental object is created to track the rental.

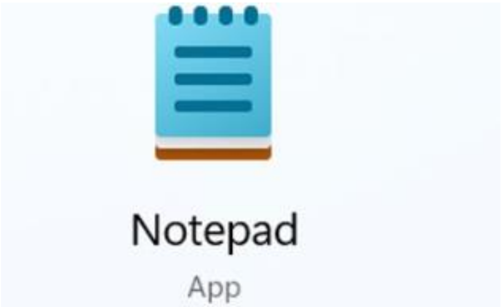
3. Returning a Car:

- When the user selects "Return a Car", they enter the car's registration number.
- The system checks if the car is rented. If found, the car's availability is set to true, and the rental is removed from the rentals list.
- After successful return, the user is prompted to provide feedback on the car.

4. GUI Interaction:

- The main screen provides options to rent or return a car. Each action opens a dedicated dialog window for user input.
- Feedback is requested only after a car is returned, ensuring a smooth flow and reducing unnecessary prompts.
- The program uses a single window interface for simplicity, with dynamic content updates based on user interactions.

SOTWARE TOOLS USED



CHALLENGES AND SOLUTIONS

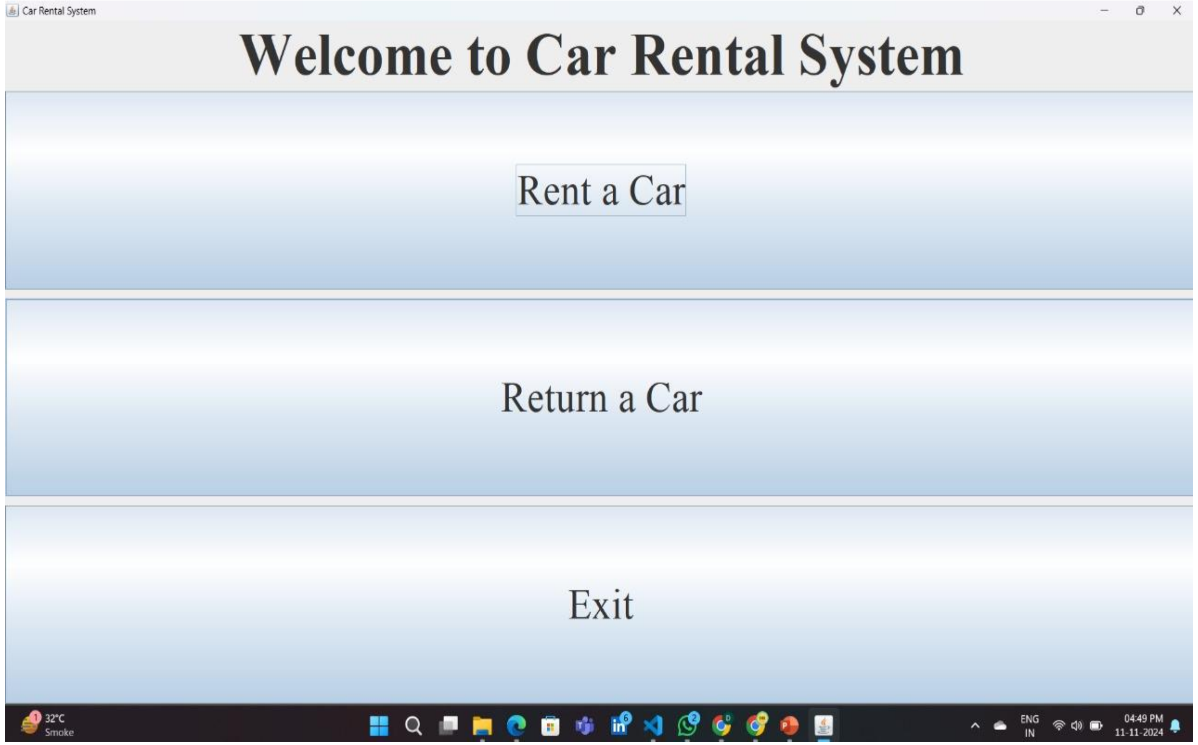
1. **Data Management**: Used ArrayList to organize cars, customers, and rentals, allowing efficient data storage, access, and modification.

2. User Workflow: Created clear methods for renting and returning cars, with button actions that guide users through each process.

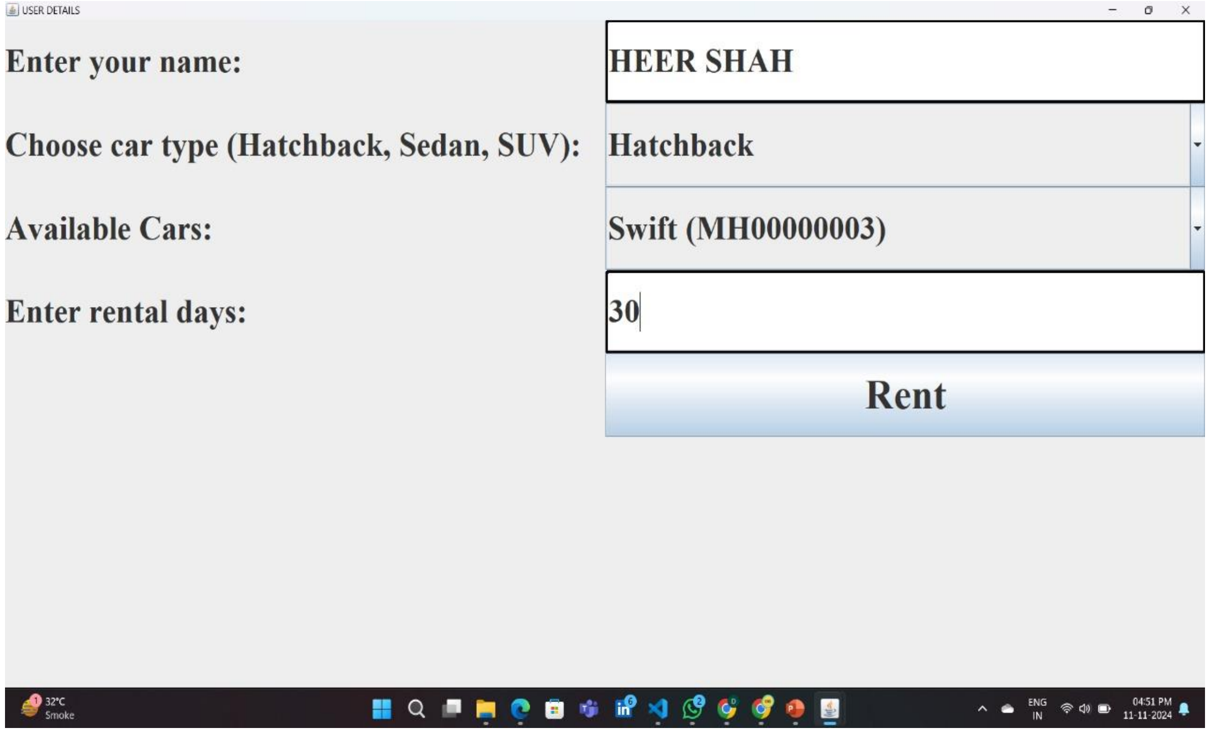
3. Error Prevention: Added validation checks to avoid actions like returning non-rented cars and streamlined prompts to prevent user errors.

4. Single-Frame Interface: Designed a unified GUI that avoids multiple windows, keeping interactions straightforward and user-friendly.

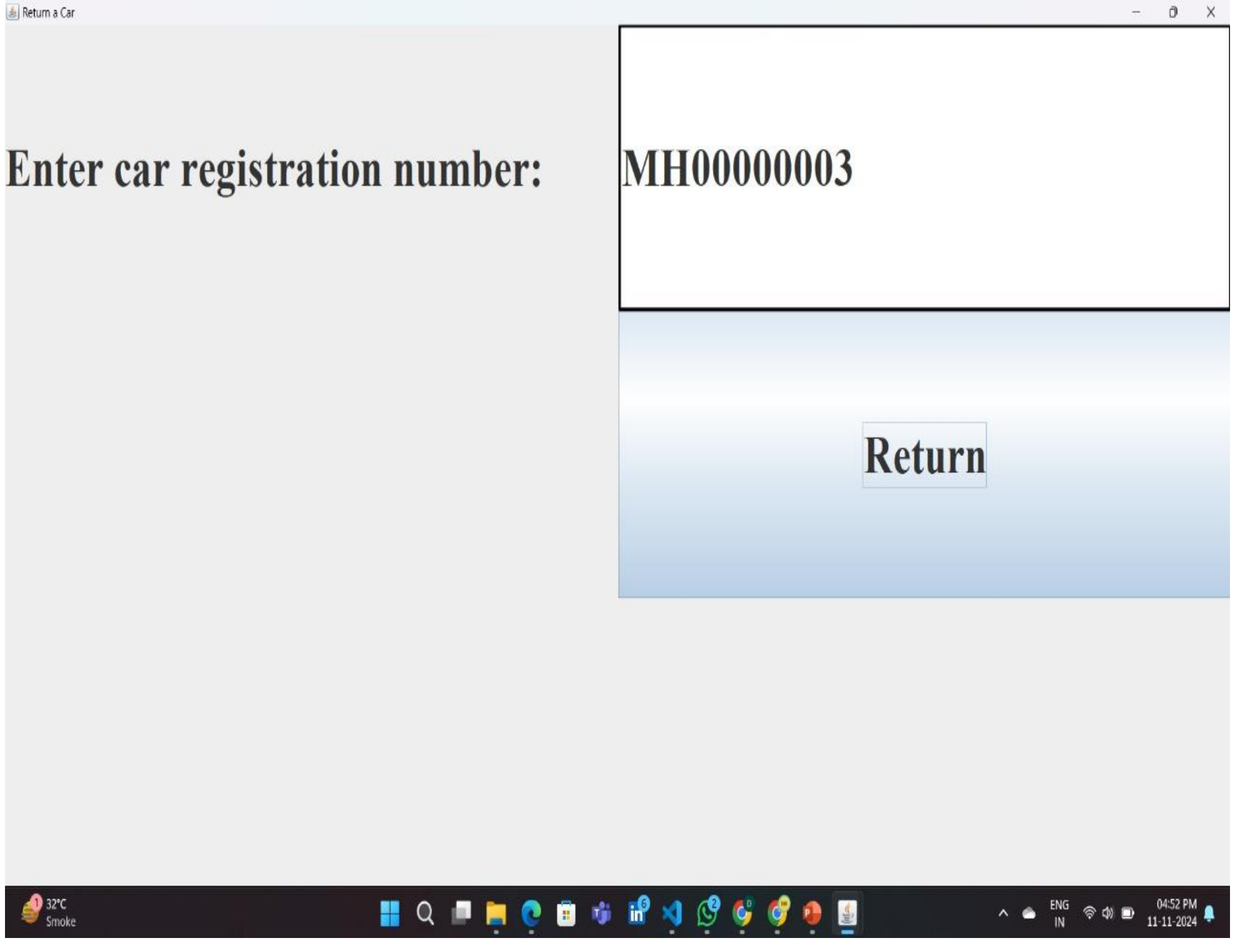
RESULTS



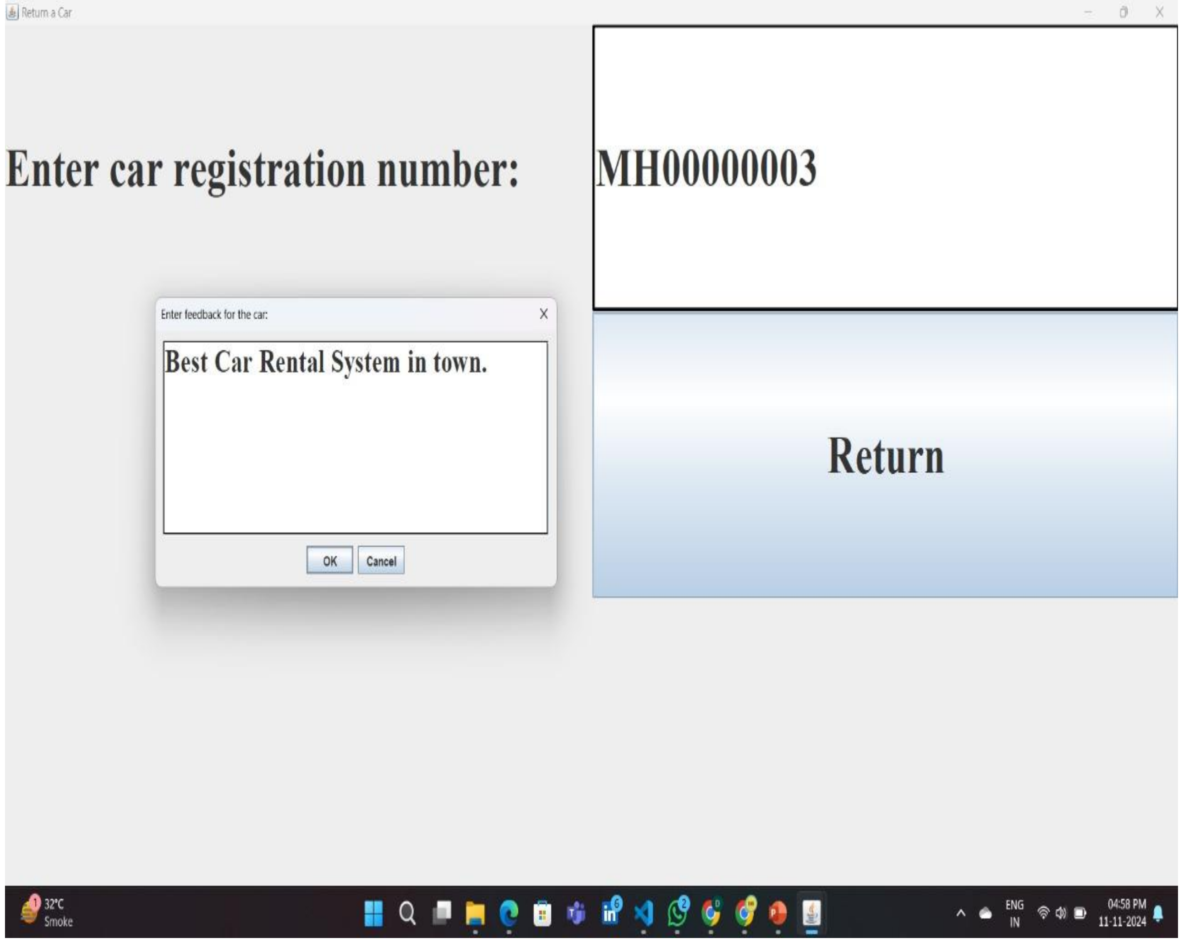
Welcome to Car Rental System



Enter your name:	HEER SHAH
Choose car type (Hatchback, Sedan, SUV):	Hatchback
Available Cars:	Swift (MH00000003)
Enter rental days:	30



Enter car registration number: MH00000003



Enter car registration number: MH00000003

Enter feedback for the car:

Best Car Rental System in town.

FUTURE ENHANCEMENTS

- **Enhanced GUI**: Improve the graphical user interface for better user experience and interaction.

- **Client-Based Features**: Implement a client-based system that allows users to manage their rentals more efficiently.

- **Database Integration**: Add a database to store and manage customer and rental data for better data persistence and retrieval.

CONCLUSION

our **Car Rental System** effectively automates the rental process, managing inventory, customer details, bookings, and payments through Object-Oriented Programming principles. The system enhances user experience with features for renting and returning cars, as well as handling payments. Future enhancements will include integrating a database, improving the GUI, and developing a client-based system for better customer engagement. These upgrades will further enhance our system's functionality and user satisfaction.

Thank you!!