

Project Report – Logistics Management System

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Project repository URL link: <https://github.com/chathuniM/My-Project-Report.git>

1. Project Objective

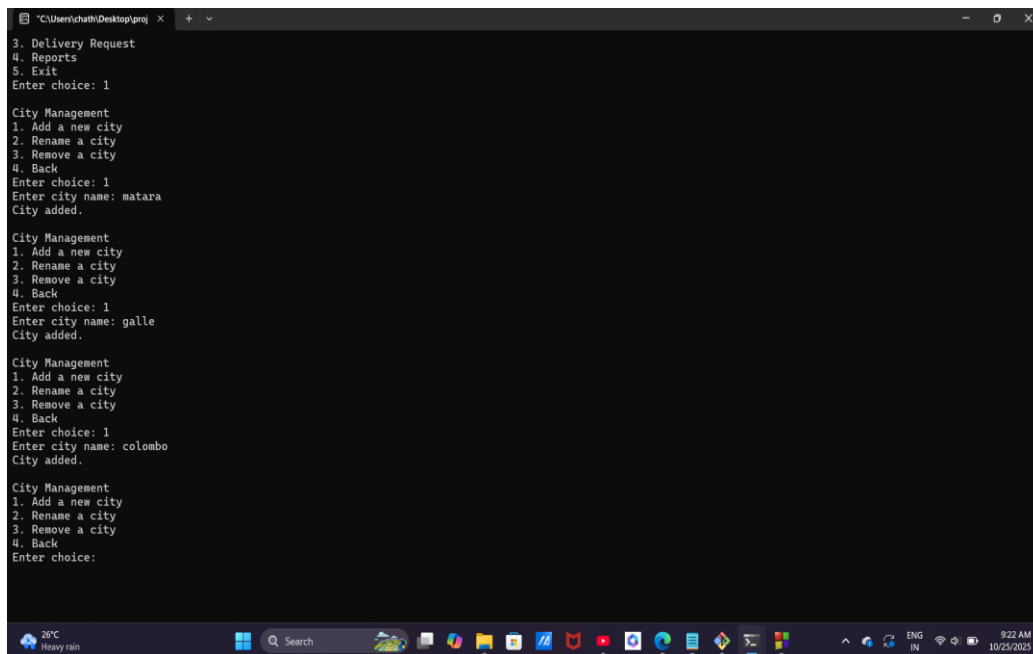
The purpose of this project is to design and implement a menu-driven logistics management system in C. It uses arrays, structures, functions, loops, and conditionals to simulate real logistics operations like managing cities, delivery routes, vehicles, and calculating delivery costs.

System Functionalities

City Management • Add, rename, or remove up to 30 cities.

- City names are stored in a string array.
- Functions used: addCity(), renameCity(), removeCity(), findCityIndex()

Adding the addCity function:



```
C:\Users\chath\Desktop\proj x + -
3. Delivery Request
4. Reports
5. Exit
Enter choice: 1

City Management
1. Add a new city
2. Rename a city
3. Remove a city
4. Back
Enter choice: 1
Enter city name: matara
City added.

City Management
1. Add a new city
2. Rename a city
3. Remove a city
4. Back
Enter choice: 1
Enter city name: galle
City added.

City Management
1. Add a new city
2. Rename a city
3. Remove a city
4. Back
Enter choice: 1
Enter city name: colombo
City added.

City Management
1. Add a new city
2. Rename a city
3. Remove a city
4. Back
Enter choice:
```

Adding renameCity function:

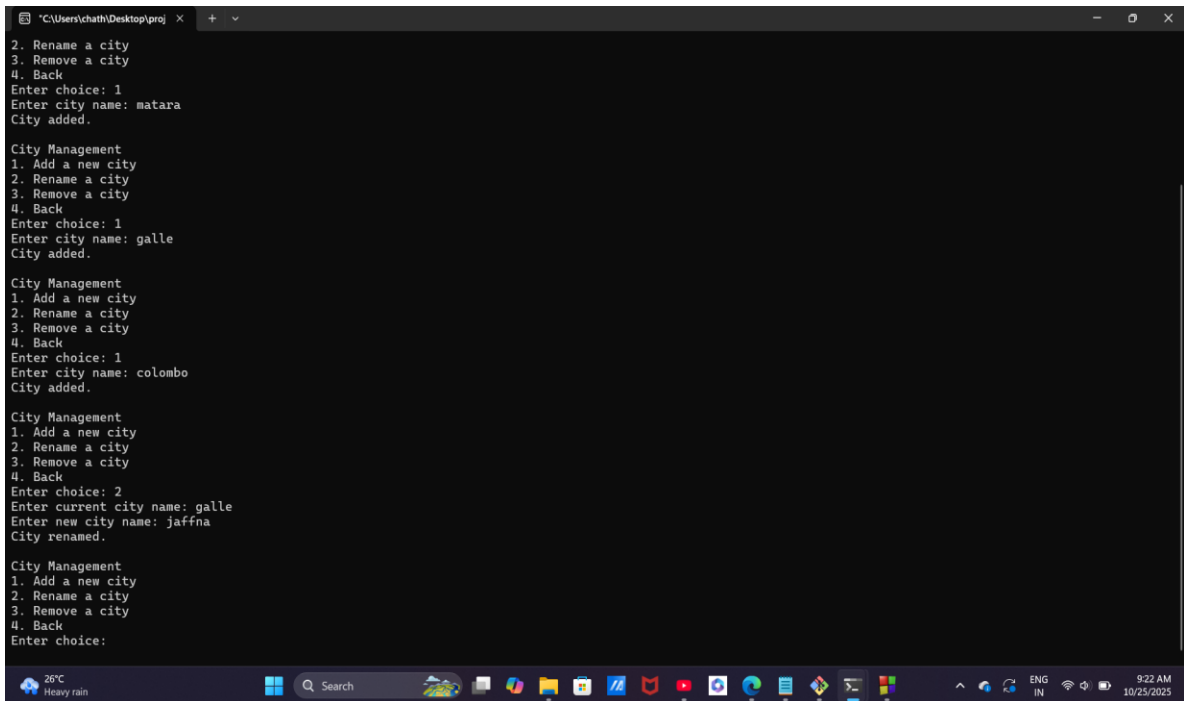
```
"C:\Users\chath\Desktop\proj" x + -
2. Rename a city
3. Remove a city
4. Back
Enter choice: 1
Enter city name: matara
City added.

City Management
1. Add a new city
2. Rename a city
3. Remove a city
4. Back
Enter choice: 1
Enter city name: galle
City added.

City Management
1. Add a new city
2. Rename a city
3. Remove a city
4. Back
Enter choice: 1
Enter city name: colombo
City added.

City Management
1. Add a new city
2. Rename a city
3. Remove a city
4. Back
Enter choice: 2
Enter current city name: galle
Enter new city name: jaffna
City renamed.

City Management
1. Add a new city
2. Rename a city
3. Remove a city
4. Back
Enter choice:
```



Adding removeCity function:

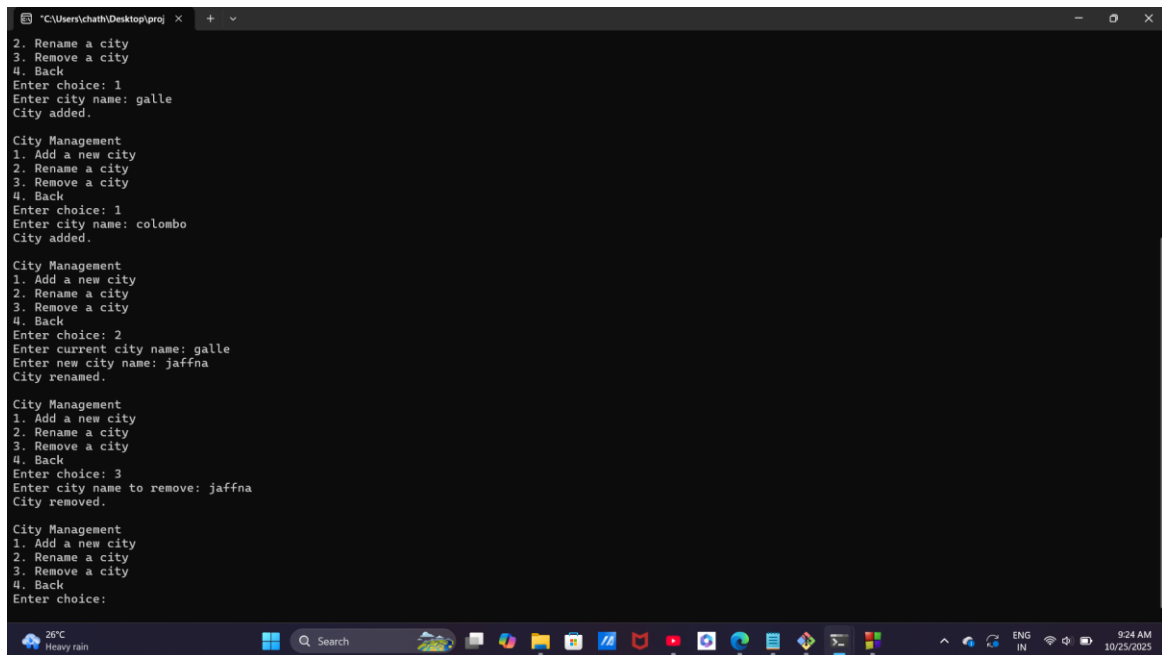
```
"C:\Users\chath\Desktop\proj" x + -
2. Rename a city
3. Remove a city
4. Back
Enter choice: 1
Enter city name: galle
City added.

City Management
1. Add a new city
2. Rename a city
3. Remove a city
4. Back
Enter choice: 1
Enter city name: colombo
City added.

City Management
1. Add a new city
2. Rename a city
3. Remove a city
4. Back
Enter choice: 2
Enter current city name: galle
Enter new city name: jaffna
City renamed.

City Management
1. Add a new city
2. Rename a city
3. Remove a city
4. Back
Enter choice: 3
Enter city name to remove: jaffna
City removed.

City Management
1. Add a new city
2. Rename a city
3. Remove a city
4. Back
Enter choice:
```



2.Distance Management

- Distances stored in a 2D array: `int distance[MAX_CITIES][MAX_CITIES];`
- Distance from a city to itself = 0
- Distance is symmetrical ($\text{distance}[i][j] = \text{distance}[j][i]$)
- Functions used: `editDistance()`, `displayDistanceTable()`, `initializeDistance()`

```
"C:\Users\chath\Desktop\proj" x + v
City renamed.

City Management
1. Add a new city
2. Rename a city
3. Remove a city
4. Back
Enter choice: 3
Enter city name to remove: jaffna
City removed.

City Management
1. Add a new city
2. Rename a city
3. Remove a city
4. Back
Enter choice: 4

Logistics Management System
1. City Management
2. Distance Management
3. Delivery Request
4. Reports
5. Exit
Enter choice: 2

Distance Management
1. Input or edit distances
2. Display distance table
3. Back
Enter choice: 1
Enter source city name: matara
Enter destination city name: colombo
Enter distance (km): 120
Distance updated.

Distance Management
1. Input or edit distances
2. Display distance table
3. Back
Enter choice:
```

```
'C:\Users\chath\Desktop\proj' x + v
2. Rename a city
3. Remove a city
4. Back
Enter choice: 4

Logistics Management System
1. City Management
2. Distance Management
3. Delivery Request
4. Reports
5. Exit
Enter choice: 2

Distance Management
1. Input or edit distances
2. Display distance table
3. Back
Enter choice: 1
Enter source city name: matara
Enter destination city name: colombo
Enter distance (km): 120
Distance updated.

Distance Management
1. Input or edit distances
2. Display distance table
3. Back
Enter choice: 2
Distance Table:


|         | Colombo | Kandy | Galle | matara | colombo |
|---------|---------|-------|-------|--------|---------|
| Colombo | 0       | 120   | 115   | -      | -       |
| Kandy   | 120     | 0     | 230   | -      | -       |
| Galle   | 115     | 230   | 0     | -      | -       |
| matara  | -       | -     | -     | 0      | 120     |
| colombo | -       | -     | -     | 120    | 0       |



Distance Management
1. Input or edit distances
2. Display distance table
3. Back
Enter choice:
```

3. Vehicle Management

Three vehicles are defined using structures:

```
struct Vehicle {
    char name[10];
    int capacity;
    int rate_per_km;
    int avg_speed; int fuel_eff;
};
```

4. Delivery Request Handling

The user inputs:

- Source city
- Destination city
- Weight (kg)
- Vehicle type (Van/Truck/Lorry)

The system validates:

- Source \neq Destination
- Weight \leq Vehicle capacity

Then calculates: Delivery Cost = $D \times R \times (1 + W/10000)$

Time = D / S

Fuel Used = D / E

Fuel Cost = Fuel Used \times 310

Total Cost = Delivery Cost + Fuel Cost

Profit = Delivery Cost \times 0.25

Final Charge = Total Cost + Profit

```
"C:\Users\chath\Desktop\lproj" x + v
1. Input or edit distances
2. Display distance table
3. Back
Enter choice: 3

Logistics Management System
1. City Management
2. Distance Management
3. Delivery Request
4. Reports
5. Exit
Enter choice: 3
Enter source city name: matara
Enter destination city name: colombo
Enter weight (kg): 500
Select vehicle type (1=Van, 2=Truck, 3=Lorry): 1
=====
DELIVERY COST ESTIMATION
=====
From: matara
To: colombo
Minimum Distance: 120 km
Vehicle: Van
Weight: 500 kg
=====
Base Cost: 120 * 30 * (1 + 500/10000) = 3780.00 LKR
Fuel Used: 10.00 L
Fuel Cost: 3100.00 LKR
Operational Cost: 6880.00 LKR
Profit: 945.00 LKR
Customer Charge: 7825.00 LKR
Estimated Time: 2.00 hours
=====
Logistics Management System
1. City Management
2. Distance Management
3. Delivery Request
4. Reports
5. Exit
Enter choice:
```

5. Reports

- Shows number of deliveries, total distance, and total profit.
- Displays average delivery time and highest cost delivery.

=====

DELIVERY COST ESTIMATION

From: Colombo
To: Jaffna
Minimum Distance: 400 km
Vehicle: Truck
Weight: 2000 kg

Base Cost: $400 \times 40 \times (1 + 2000/10000) = 19200.00$ LKR
Fuel Used: 66.67 L
Fuel Cost: 20666.67 LKR
Operational Cost: 39866.67 LKR
Profit: 4800.00 LKR
Customer Charge: 44666.67 LKR
Estimated Time: 8.00 hours

=====

```
"C:\Users\chath\Desktop\proj" x + v
Enter weight (kg): 500
Select vehicle type (1=Van, 2=Truck, 3=Lorry): 1
=====
DELIVERY COST ESTIMATION
=====
From: matara
To: colombo
Minimum Distance: 120 km
Vehicle: Van
Weight: 500 kg
=====
Base Cost: 120 * 30 * (1 + 500/10000) = 3780.00 LKR
Fuel Used: 10.00 L
Fuel Cost: 3100.00 LKR
Operational Cost: 6880.00 LKR
Profit: 945.00 LKR
Customer Charge: 7825.00 LKR
Estimated Time: 2.00 hours
=====

Logistics Management System
1. City Management
2. Distance Management
3. Delivery Request
4. Reports
5. Exit
Enter choice: 4
Performance Reports:
a. Total Deliveries Completed: 1
b. Total Distance Covered: 120.00 km
c. Average Delivery Time: 2.00 hours
d. Total Revenue: 7825.00 LKR, Total Profit: 945.00 LKR
e. Longest Route: 120.00 km, Shortest Route: 120.00 km

Logistics Management System
1. City Management
2. Distance Management
3. Delivery Request
4. Reports
5. Exit
Enter choice:
```

6. Conclusion

This project demonstrates how arrays, structures, functions, and algorithms can be used to simulate a real logistics management system in C.

It performs city management, vehicle handling, cost estimation, and profit calculations efficiently.

```
"C:\Users\chath\Desktop\proj" x + v
Minimum Distance: 120 km
Vehicle: Van
Weight: 500 kg
=====
Base Cost:  $120 \times 30 \times (1 + 500/10000) = 3780.00$  LKR
Fuel Used: 10.00 L
Fuel Cost: 3100.00 LKR
Operational Cost: 6880.00 LKR
Profit: 945.00 LKR
Customer Charge: 7825.00 LKR
Estimated Time: 2.00 hours
=====
Logistics Management System
1. City Management
2. Distance Management
3. Delivery Request
4. Reports
5. Exit
Enter choice: 4
Performance Reports:
a. Total Deliveries Completed: 1
b. Total Distance Covered: 120.00 km
c. Average Delivery Time: 2.00 hours
d. Total Revenue: 7825.00 LKR, Total Profit: 945.00 LKR
e. Longest Route: 120.00 km, Shortest Route: 120.00 km
Logistics Management System
1. City Management
2. Distance Management
3. Delivery Request
4. Reports
5. Exit
Enter choice: 5
Routes saved successfully.
Deliveries saved successfully.
Exiting program.
Process returned 0 (0x0)   execution time : 244.361 s
Press any key to continue.
```

