

## Project Report – Logistics Management System

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

### 1. Project Objective

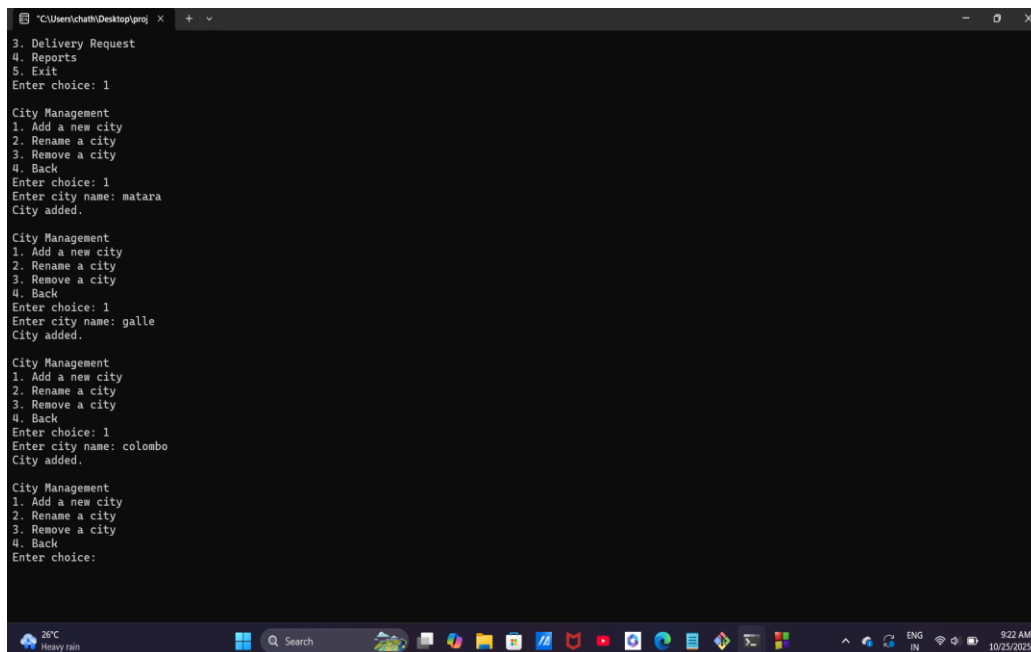
The purpose of this project is to design and implement a menu-driven logistics management system in C. It uses arrays, structures, functions, loops, and conditionals to simulate real logistics operations like managing cities, delivery routes, vehicles, and calculating delivery costs.

#### 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    | -       |



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.
```

