🧩 Project Report – CSC1012: Introduction to Computer Programming

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Subject: CSC1012 – Introduction to Computer Programming
Project Title: Logistics Management System
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◆ 1. Introduction

This project is a simple logistics management system implemented in the C programming language.
It allows users to manage cities, edit distances, calculate delivery costs, and find the least-cost route between two locations.

◆ 2. Implemented Functions

Function	Description
`manageCities()`	Displays the city management menu (add, rename, remove, list).
`addCity()`	Adds new cities with validation for duplicates.
`renameCity()`	Allows renaming existing cities.
`removeCity()`	Removes a selected city and updates the distance matrix.
`listCities()`	Lists all available cities.
`editDistance()`	Updates the distance between two cities.
`showDistanceTable()`	Displays a formatted distance table.
`showVehicles()`	Displays available vehicles (Van, Truck, Lorry).
`addDelivery()`	Calculates delivery costs, profit, and time based on vehicle and distance.
`showDeliveries()`	Shows all delivery records.
`showReport()`	Displays performance summary (total distance, profit, etc.).

`saveDeliveries()` Saves delivery data to a file (`deliveries.txt`).

`loadDeliveries()` Loads saved deliveries from the text file.

`findLeastCostRoute()` Uses Dijkstra's algorithm to find the least-cost path between cities.

◆ **3. GitHub Repository Link**

👉 https://github.com/hashintha1221/logistics_management_system

Main menu

```
Welcome to Logistics Management System by Hashintha Dilshan
-------------------------------------------------
1. Manage Cities
2. Edit Distance
3. Show Distance Table
4. Add Delivery
5. Show Deliveries
6. Show Report
7. Save Deliveries
8. Load Deliveries
9. Find Least Cost Route
0. Exit
=========================================
```

1 Manege Cities.

```
Welcome to Logistics Management System by Hashintha Dilshan
-----------------------------------------------------
1. Manage Cities
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0. Exit
=======================================
Enter choice: 1

=== CITY MANAGEMENT ===
1. Add City
2. Rename City
3. Remove City
4. List Cities
0. Back to Main Menu
Enter your choice: 1
Enter city name: colombo
City added successfully!

=== CITY MANAGEMENT ===
1. Add City
2. Rename City
3. Remove City
4. List Cities
0. Back to Main Menu
Enter your choice: 1
Enter city name: kandy
City added successfully!
```

```
=== CITY MANAGEMENT ===
1. Add City
2. Rename City
3. Remove City
4. List Cities
0. Back to Main Menu
Enter your choice: 2

Cities:
0. colombo
1. kandy
2. kurunagala
3. mathara
Enter city index to rename: 3
Enter new name for mathara: matara
City renamed successfully!

=== CITY MANAGEMENT ===
1. Add City
2. Rename City
3. Remove City
4. List Cities
0. Back to Main Menu
Enter your choice: 4

Cities:
0. colombo
1. kandy
2. kurunagala
3. matara
```

2 edit distance

```
C:\Users\DELL\Desktop\logistics_management_system\main.exe
Enter choice: 2

Cities:
0. colombo
1. kandy
2. kurunagala
3. matara
Enter source city index: 0
Enter destination city index: 1
Enter distance between colombo and kandy (km): 130
Distance updated!
Welcome to Logistics Management System by Hashintha Dilshan
------------------------------------------------------
1. Manage Cities
2. Edit Distance
3. Show Distance Table
4. Add Delivery
5. Show Deliveries
6. Show Report
7. Save Deliveries
8. Load Deliveries
9. Find Least Cost Route
0. Exit
======================================
Enter choice: 2

Cities:
0. colombo
1. kandy
2. kurunagala
3. matara
Enter source city index: 2
Enter destination city index: 3
Enter distance between kurunagala and matara (km): 240
Distance updated!
```

<u>3 show distance table</u>

```
Welcome to Logistics Management System by Hashintha Dilshan
------------------------------------------------------
1. Manage Cities
2. Edit Distance
3. Show Distance Table
4. Add Delivery
5. Show Deliveries
6. Show Report
7. Save Deliveries
8. Load Deliveries
9. Find Least Cost Route
0. Exit
======================================
Enter choice: 3

Distance Table (km):
          colombo    kandy      kurunagalamatara
colombo   0.0        130.0      0.0       160.0
kandy     130.0      0.0        50.0      0.0
kurunagala0.0        50.0       0.0       240.0
matara    160.0      0.0        240.0     0.0
```

4 Add delivery

```
4. Add Delivery
5. Show Deliveries
6. Show Report
7. Save Deliveries
8. Load Deliveries
9. Find Least Cost Route
0. Exit
=======================================
Enter choice: 4

Cities:
0. colombo
1. kandy
2. kurunagala
3. matara
Enter source index: 0
Enter destination index: 1
Enter weight (kg): 600

Available Vehicle
1. Van - Capacity: 1000kg | Rate: 30.00 LKR/km | Speed: 60 km/h | Efficiency: 12.0 km/l
2. Truck - Capacity: 5000kg | Rate: 40.00 LKR/km | Speed: 50 km/h | Efficiency: 6.0 km/l
3. Lorry - Capacity: 10000kg | Rate: 80.00 LKR/km | Speed: 45 km/h | Efficiency: 4.0 km/l
Select vehicle (1=Van, 2=Truck, 3=Lorry): 1

--- DELIVERY SUMMARY ---
From: colombo
To: kandy
Vehicle: Van
Weight: 600.0 kg
Distance: 130.0 km
Transport Cost: 4134.00 LKR
Fuel Used: 10.83 L
Fuel Cost: 3358.33 LKR
Total Operational Cost: 7492.33 LKR
Profit: 1033.50 LKR
Customer Charge: 8525.83 LKR
Estimated Time: 2.17 hours
----------------------------
```

5 show deliveries

```
Welcome to Logistics Management System by Hashintha Dilshan
-----------------------------------------------------
1. Manage Cities
2. Edit Distance
3. Show Distance Table
4. Add Delivery
5. Show Deliveries
6. Show Report
7. Save Deliveries
8. Load Deliveries
9. Find Least Cost Route
0. Exit
==========================================
Enter choice: 5

 ALL DELIVERIES:

Delivery #1
From: colombo -> kandy
Vehicle: Van
Weight: 600.0 kg | Distance: 130.0 km
Charge: 8525.83 LKR | Profit: 1033.50 LKR | Time: 2.17 hrs

Delivery #2
From: kurunagala -> matara
Vehicle: Truck
Weight: 1200.0 kg | Distance: 240.0 km
Charge: 25840.00 LKR | Profit: 2688.00 LKR | Time: 4.80 hrs
==========================
```

6 show report

```
Welcome to Logistics Management System by Hashintha Dilshan
------------------------------------------------------
1. Manage Cities
2. Edit Distance
3. Show Distance Table
4. Add Delivery
5. Show Deliveries
6. Show Report
7. Save Deliveries
8. Load Deliveries
9. Find Least Cost Route
0. Exit
====================================
Enter choice: 6

==== PERFORMANCE REPORT ====
Total Deliveries: 2
Total Distance: 370.0 km
Average Time: 3.48 hours
Total Profit: 3721.50 LKR
============================
```

9 find least cost route

```
Welcome to Logistics Management System by Hashintha Dilshan
------------------------------------------------------
1. Manage Cities
2. Edit Distance
3. Show Distance Table
4. Add Delivery
5. Show Deliveries
6. Show Report
7. Save Deliveries
8. Load Deliveries
9. Find Least Cost Route
0. Exit
====================================
Enter choice: 9

Cities:
0. colombo
1. kandy
2. kurunagala
3. matara
Enter source city index: 1
Enter destination city index: 3

Least-Cost Route from kandy to matara:
kandy -> kurunagala -> matara
Total Distance: 290.0 km
```