

ICT 1011 Computer Programming

Assignment (Individual)

Management System

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Index Number : As20240925
Date : 2025-10-25

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Introduction

This program is a Logistics Management System, written using the Java language. This system can manage data for a delivery service between cities

This is a menu-driven system, allowing the user to perform various actions according to the selected options. The data is stored in files and can be retrieved again when the system is restarted.

Objectives

- Calculating distribution costs, profits, and fuel consumption.
- When submitting a delivery request, obtaining the necessary information (Source city, Destination city, Weight, Vehicle type) and providing information related to the upcoming delivery request (short distance between two cities, travel time, etc).
- Generating performance reports and delivery records.

System Overview

structure in the main menu

1. City Management
 - 1.1.Add a new City
 - 1.2.Remove a City
 - 1.3.Rename a City
2. Distance Management
 - 2.1.Display a distance table
 - 2.2.Add a new distance or edit an existing one
3. Vehicle Management
 - 3.1.Display vehicle types
 - 3.1.1. Van
 - 3.1.2. Truck
 - 3.1.3. Lorry
4. Delivery Request

Enter source city, destination, vehicle, and weight

System automatically calculates:

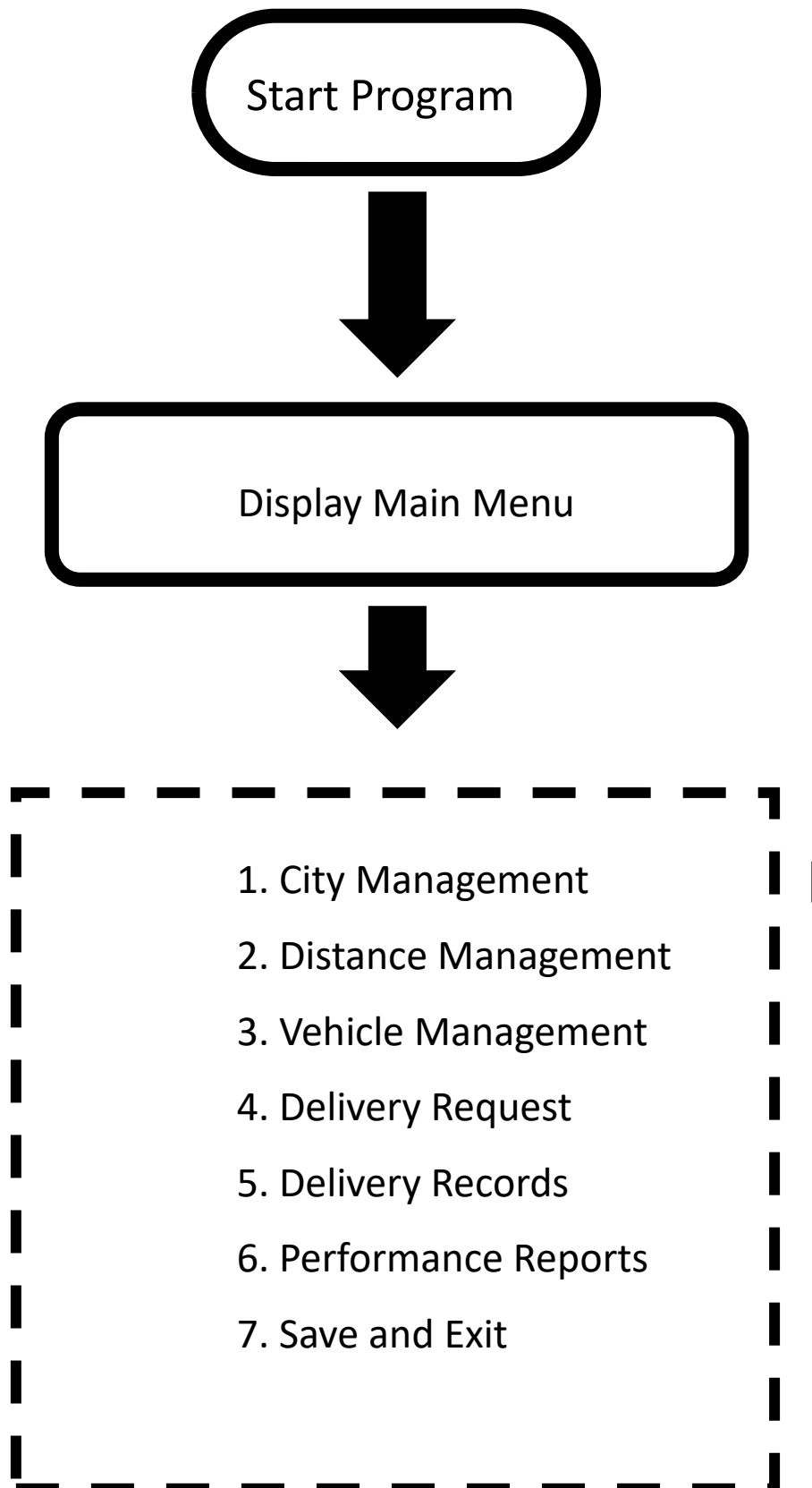
 - Minimum distance
 - Base cost and fuel cost
 - Profit and customer charge
 - Delivery time
5. Delivery Records

Displays all completed deliveries (city, distance, vehicle, weight, cost)
6. Performance Reports
 - 6.1.Total number of deliveries
 - 6.2.Total distance covered
 - 6.3.Average delivery time
 - 6.4.Total profit

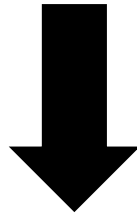
7. Save & Exit

Saves all data to files (routes.txt, deliveries.txt) and exits the program

System Design



(Perform user-selected task)



Start Program
(selected Save and Exit)

Main methods in the Project

Methods name	Purpose
CityManagement()	Display city management menu
addcity()	Add a new city to system
removecity()	Remove a city
renamecity()	Rename city an existing one
DistanceManagement()	Display Distance Management menu
Inputdistances ()	Input new distance in system

Displaydistances ()	Display distances an existing one
VehicleManagement ()	Display vehicle details
Delivaryrequest ()	Receives a delivery request
Basecost ()	Calculate base cost
Fuelused ()	Calculate fuel used and cost
Time ()	Calculate Past time
reports ()	
minimumparth ()	Calculate minimum distance
DeliveryRecords ()	

Calculations Used

- Distance D (from distance ma
- Weight W (kg)
- Rate per km R (from vehicle type)
- Vehicle speed S (km/h)
- Efficiency E (km/l)
- Fuel price F (e.g., 310 LKR per Liter)

Delivery Cost:

$$\textbf{Cost} = \textbf{D} \times \textbf{R} \times (\textbf{1} + \textbf{W} \times \textbf{1 10000})$$

Estimated Delivery Time (hours):

$$\textbf{Time} = \textbf{D S}$$

Fuel Consumption:

$$\textbf{FuelUsed} = \textbf{D E}$$

Fuel Cost:

$$\textbf{FuelCost} = \textbf{FuelUsed} \times \textbf{F}$$

Total Operational Cost:

$$\textbf{TotalCost} = \textbf{DeliveryCost} + \textbf{FuelCost}$$

Profit Calculation:

$$\textbf{Profit} = (\textbf{Cost} \times \textbf{0. 25})$$

Final Charge to Customer:

$$\textbf{CustomerCharge} = \textbf{TotalCost} + \textbf{Profit}$$

Sample Output

City Management

```
Routes loaded successfully from routes.txt
Deliveries loaded successfully from deliveries.txt
=====
          Menu-driven logistics management system
=====
1.City Management
2.Distance Management
3.Vehicle Management
4.Delivery Request
5.Delivery Records
6.Performance Reports
7.Save & Exit
Enter your choice: 1
-----

1:colombo
2:gampaha
3:galle
4:kandy
5:ja-ela
6:ampara

-----

1:Add a new city
2:Remove city
3:Rename city
4:Exsit
Enter your choice: 1
-----

Enter new City name:panadura
*****
Success
```

```
-----
1:Add a new city
2:Remove city
3:Rename city
4:Exsit
Enter your choice: 2
-----

1:colombo
2:gampaha
3:galle
4:kandy
5:ja-ela
6:ampara
7:panadura
which you need to remove a city number : 7
panadura is removed
-----

1:Add a new city
2:Remove city
3:Rename city
4:Exsit
Enter your choice: 3
-----

1:colombo
2:gampaha
3:galle
4:kandy
5:ja-ela
6:ampara
which you need to rename a city number : 6
old name : ampara
new name : jafna
Success
-----
```

Distance Management

```
-----
1:Display the distance table
2:Input or edit distances between two cities
3:Exsit
Enter your choice: 1
-----

      colombo gampaha galle   kandy   ja-ela   jafna   null
colombo 0.0     36.0    130.0   122.0   25.0     0.0     0.0
gampaha 36.0     0.0     0.0     0.0     0.0     0.0     0.0
galle   130.0    0.0     0.0     0.0     0.0     0.0     0.0
kandy   122.0    0.0     0.0     0.0     0.0     0.0     0.0
ja-ela  25.0     0.0     0.0     0.0     0.0     0.0     0.0
jafna   0.0      0.0     0.0     0.0     0.0     0.0     0.0
null    0.0      0.0     0.0     0.0     0.0     0.0     0.0
-----

1:Display the distance table
2:Input or edit distances between two cities
3:Exsit
Enter your choice: 2
-----

1:colombo
2:gampaha
3:galle
4:kandy
5:ja-ela
6:jafna

-----Input Distances-----
enter source city number : 1
enter Destination city number : 6

Enter Distances between two cities(Km) : 398
-----
```

Delivery Request Management

```
1:colombo
2:gampaha
3:galle
4:kandy
5:ja-ela
6:jafna
Enter source city index :      1

Enter Destination city index :    6

1.Van
2.Truck
3.Lory
Enter Vehicle type :      1
capacity: 1000kg
Enter Weight (in kg) :    500
=====
DELIVERY COST ESTIMATION
-----
From: colombo
TO: jafna
Minimum Distance: Minimum Distance: 398.0 km
-----
Vehicle: Van
Weight: 500kg
-----

Base Cost: 398.0 X 30 X (1+500/10000) = 11940.0 LKR
Fuelused: 33.166666666666664 L
Fuelcost: 10281.666666666666 LKR
Operational Cost: 22221.666666666664LKR
Profit: 2985.0LKR
Customer Charge: 2985.022221.666666666664LKR
Estimated Time: 6.633333333333334 hours
=====
```

Delivery Records and Performance Reports

```
Enter your choice: 5
-----

count    From      To      Distance(km)  vehicle type  Weight(KG)  Customer Charge(LKR)
1        colombo  gampaha   36.0          Van           50.0        2286.75
2        colombo  galle    130.0         Truck         4500.0      16141.666666666668

-----

1.City Management
2.Distance Management
3.Vehicle Management
4.Delivery Request
5.Delivery Records
6.Performance Reports
7.Save & Exit
Enter your choice: 6
-----

*****
Total Deliveries Completed :2
Total Distance Covered : 166.0 KM
Average Delivery Time : 1.6
Total Revenue and Profit : 2156.35 LKR
Longest Routes: 130.0 Km
Shortest Routes: 36.0Km

1.City Management
2.Distance Management
3.Vehicle Management
4.Delivery Request
5.Delivery Records
6.Performance Reports
7.Save & Exit
Enter your choice: |
```

Exit

```
1.City Management
2.Distance Management
3.Vehicle Management
4.Delivery Request
5.Delivery Records
6.Performance Reports
7.Save & Exit
Enter your choice: 7
-----

Routes saved successfully to routes.txt
Deliveries saved successfully to deliveries.txt
Data saved successfully!
Exiting program...
```

Future Enhancements

- Integrate a Graphical User Interface (GUI) for better usability.
- Implement a database (MySQL) for persistent and scalable storage.
- Add real-time tracking and vehicle scheduling features.
- Include advanced optimization like fuel efficiency routing or multi-stop delivery planning

Git link

<https://github.com/kaveesha580/Assignment.git>