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Welcome to the Waste Management System
```

```
Enter your choice of which algorithm you want to run:
```

1. Non-Optimized Route - Fixed Shortest Path Algorithm
2. Greedy Route - Dijkstra Algorithm
3. Optimized Route - Floyd Warshall Algorithm
4. TSP Route - Travelling Salesman Problem Algorithm
5. Print Map - Graph, Distance Matrix
6. Regenerate Waste Levels
7. Exit

```
Current Waste Levels:
```

```
Waste at Location 1: 49%  
Waste at Location 2: 16%  
Waste at Location 3: 51%  
Waste at Location 4: 6%  
Waste at Location 5: 76%  
Waste at Location 6: 32%  
Waste at Location 7: 83%
```

```
Waste in kg:
```

```
Waste in KG at Location 1: 245kg  
Waste in KG at Location 2: 80kg  
Waste in KG at Location 3: 255kg  
Waste in KG at Location 4: 30kg  
Waste in KG at Location 5: 380kg  
Waste in KG at Location 6: 160kg  
Waste in KG at Location 7: 415kg
```

```
Enter your choice (1 - 7): 1
```

## Screenshot 1

```
Non-Optimized Route - Fixed Shortest Path Algorithm  
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```

```
Details of Non-Optimized Route
```

1. Waste at location must be >=40% to be visited and collected
2. Distance from Waste Station to location must be <= 30km
3. Time taken must be within 12 hours, or else location will not be visited

```
Current Waste Levels:
```

```
Waste at Location 1: 49%  
Waste at Location 2: 16%  
Waste at Location 3: 51%  
Waste at Location 4: 6%  
Waste at Location 5: 76%  
Waste at Location 6: 32%  
Waste at Location 7: 83%
```

```
Waste in kg:
```

```
Waste in KG at Location 1: 245kg  
Waste in KG at Location 2: 80kg  
Waste in KG at Location 3: 255kg  
Waste in KG at Location 4: 30kg  
Waste in KG at Location 5: 380kg  
Waste in KG at Location 6: 160kg  
Waste in KG at Location 7: 415kg
```

```
Shortest Path from Waste Station to each location:
```

```
Waste Station to Location 1: 3 km      Path : Waste Station -> Location 1  
Waste Station to Location 3: 9 km      Path : Waste Station -> Location 1 -> Location 3  
Waste Station to Location 5: 29 km     Path : Waste Station -> Location 1 -> Location 3 -> Location 2 -> Location 4 -> Location 3 -> Location 6 -> Location 5  
Waste Station to Location 7: Distance exceeds 30 km, Location not visited
```

```
Driver Wage for this trip: 164 MYR
```

```
Total Distance for Visited Locations: 41 km
```

```
Total Cost: 192.5 MYR
```

```
Total Time: 8.2 hours
```

```
Total Fuel Consumption: 4.1 Liters
```

```
Cumulative total percentage of waste collected from all valid locations: 176%
```

```
Total Waste Collected: 880kg
```

```
Do you want to run another algorithm or perform other functions? (y/n):
```

## Screenshot 2

## Greedy Route - Dijkstra Algorithm

### Details of Greedy Route

1. Waste at location must be  $\geq 30\%$  to be visited and collected
2. There is NO distance restriction for the location to be visited
3. Time taken must be within 8 hours, or else location will not be visited

### Current Waste Levels:

Waste at Location 1: 49%  
Waste at Location 2: 16%  
Waste at Location 3: 51%  
Waste at Location 4: 6%  
Waste at Location 5: 76%  
Waste at Location 6: 32%  
Waste at Location 7: 83%

### Waste in kg:

Waste in KG at Location 1: 245kg  
Waste in KG at Location 2: 80kg  
Waste in KG at Location 3: 255kg  
Waste in KG at Location 4: 30kg  
Waste in KG at Location 5: 380kg  
Waste in KG at Location 6: 160kg  
Waste in KG at Location 7: 415kg

### Shortest Path from Waste Station to each location:

Waste Station to Location 1: 3 km	Path: Waste Station -> Location 1
Waste Station to Location 3: 9 km	Path: Waste Station -> Location 1 -> Location 3
Waste Station to Location 5: 14 km	Path: Waste Station -> Location 7 -> Location 6 -> Location 5
Waste Station to Location 6: 7 km	Path: Waste Station -> Location 7 -> Location 6
Waste Station to Location 7: 4 km	Path: Waste Station -> Location 7

Driver Wage for this trip: 148 MYR

Total Distance for Visited Locations: 37 km

Total Cost: 92.5 MYR

Total Time: 7.4 hours

Total Fuel Consumption: 25.9 Liters

Cumulative total percentage of waste collected from all valid locations: 291%

Total Waste Collected: 1455kg

Do you want to run another algorithm or perform other functions? (y/n): ☐

Screenshot 3

## Optimized Route - Floyd Warshall Algorithm

### Details of Optimized Route

1. Waste at location must be  $\geq 50\%$  to be visited and collected
2. Distance from Waste Station to location must be  $\leq 11\text{km}$
3. Time taken must be within 8 hours, or else location will not be visited

### Current Waste Levels:

Waste at Location 1: 49%  
Waste at Location 2: 16%  
Waste at Location 3: 51%  
Waste at Location 4: 6%  
Waste at Location 5: 76%  
Waste at Location 6: 32%  
Waste at Location 7: 83%

### Waste in kg:

Waste in KG at Location 1: 245kg  
Waste in KG at Location 2: 80kg  
Waste in KG at Location 3: 255kg  
Waste in KG at Location 4: 30kg  
Waste in KG at Location 5: 380kg  
Waste in KG at Location 6: 160kg  
Waste in KG at Location 7: 415kg

### Shortest Path from Waste Station to each location:

Waste Station to Location 3: 9 km      Path: Waste Station  $\rightarrow$  Location 1  $\rightarrow$  Location 3  
Waste Station to Location 5: Distance exceeds 11 km  
Waste Station to Location 7: 4 km      Path: Waste Station  $\rightarrow$  Location 7

Driver Wage for this trip: 52 MYR

Total Distance for Visited Locations: 13 km

Total Cost: 32.5 MYR

Total Time: 2.6 hours

Total Fuel Consumption: 9.1 Liters

Cumulative total percentage of waste collected from all valid locations: 134%

Total Waste Collected: 670kg

Do you want to run another algorithm or perform other functions? (y/n): ☐

Screenshot 4

## TSP Route – Travelling Salesman Problem Algorithm

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### Details of TSP Route

1. Waste at location must be  $\geq 60\%$  to be visited and collected
2. Distance from Waste Station to location must be  $\leq 12\text{km}$
3. Time taken must be within 8 hours, or else location will not be visited

### Current Waste Levels:

Waste at Location 1: 49%  
Waste at Location 2: 16%  
Waste at Location 3: 51%  
Waste at Location 4: 6%  
Waste at Location 5: 76%  
Waste at Location 6: 32%  
Waste at Location 7: 83%

### Waste in kg:

Waste in KG at Location 1: 245kg  
Waste in KG at Location 2: 80kg  
Waste in KG at Location 3: 255kg  
Waste in KG at Location 4: 30kg  
Waste in KG at Location 5: 380kg  
Waste in KG at Location 6: 160kg  
Waste in KG at Location 7: 415kg

### Shortest Path from Waste Station to each location:

Waste Station to Location 5: Distance exceeds 12 km  
Waste Station to Location 7: 4 km      Path: Waste Station  $\rightarrow$  Location 7

Driver Wage for this trip: 16 MYR

Total Distance for Visited Locations: 4 km

Total Cost: 10 MYR

Total Time: 0.8 hours

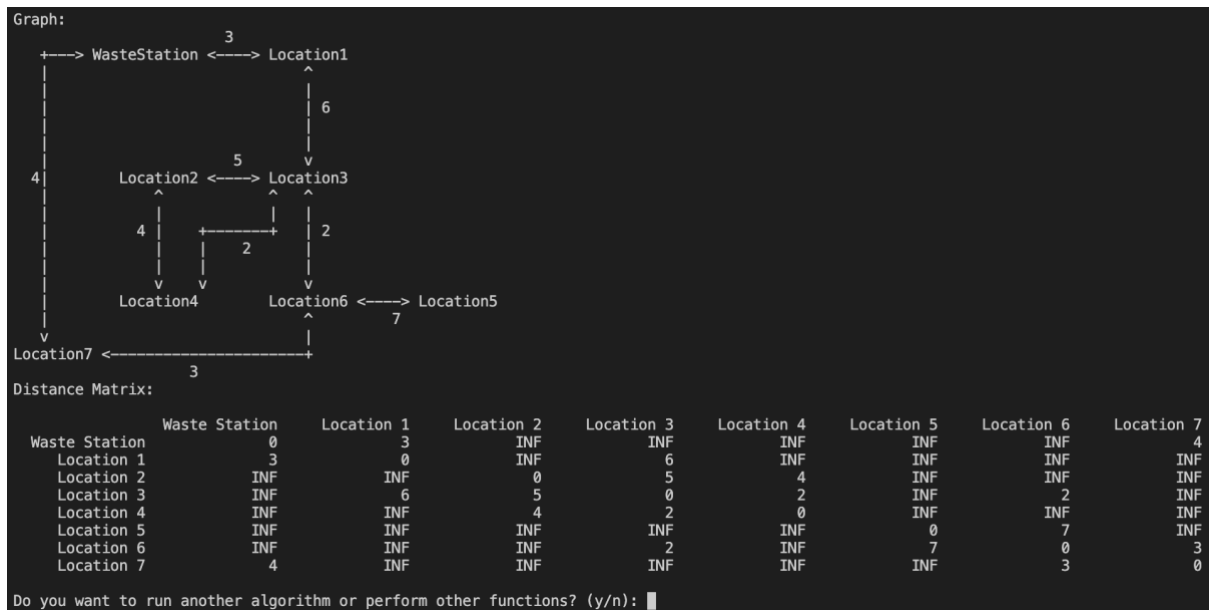
Total Fuel Consumption: 2.8 Liters

Cumulative total percentage of waste collected from all valid locations: 83%

Total Waste Collected: 415kg

Do you want to run another algorithm or perform other functions? (y/n): ☐

Screenshot 5



Screenshot 6

## Regenerating waste levels

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5. Print Map – Graph, Distance Matrix
6. Regenerate Waste Levels
7. Exit

Current Waste Levels:

Waste at Location 1: 72%  
Waste at Location 2: 56%  
Waste at Location 3: 97%  
Waste at Location 4: 51%  
Waste at Location 5: 56%  
Waste at Location 6: 79%  
Waste at Location 7: 17%

Waste in kg:

Waste in KG at Location 1: 360kg  
Waste in KG at Location 2: 280kg  
Waste in KG at Location 3: 485kg  
Waste in KG at Location 4: 255kg  
Waste in KG at Location 5: 280kg  
Waste in KG at Location 6: 395kg  
Waste in KG at Location 7: 85kg

Enter your choice (1 – 7):

Screenshot 7

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5. Print Map – Graph, Distance Matrix
6. Regenerate Waste Levels
7. Exit

Current Waste Levels:

Waste at Location 1: 72%  
Waste at Location 2: 56%  
Waste at Location 3: 97%  
Waste at Location 4: 51%  
Waste at Location 5: 56%  
Waste at Location 6: 79%  
Waste at Location 7: 17%

Waste in kg:

Waste in KG at Location 1: 360kg  
Waste in KG at Location 2: 280kg  
Waste in KG at Location 3: 485kg  
Waste in KG at Location 4: 255kg  
Waste in KG at Location 5: 280kg  
Waste in KG at Location 6: 395kg  
Waste in KG at Location 7: 85kg

Enter your choice (1 – 7): 7

Exiting the program

Screenshot 8

Enter your choice (1 – 7): 9  
Invalid choice. Please enter a valid choice.

Screenshot 9

```
Do you want to run another algorithm or perform other functions? (y/n): y
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Do you want to run another algorithm or perform other functions? (y/n): n

Exiting the program
```

Screenshot 10

```
Do you want to run another algorithm or perform other functions? (y/n): o
Invalid choice. Enter again.
Do you want to run another algorithm or perform other functions? (y/n): █
```

Screenshot 11