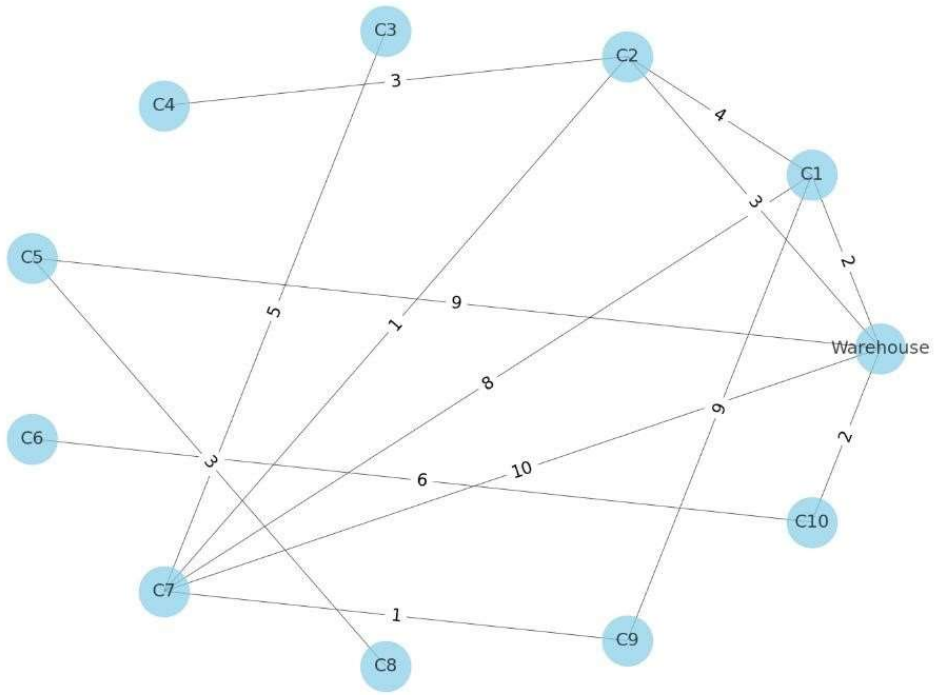
Group- 4

Constraint Satisfaction Problem for Transportation Problem

Illustration:



CODE OUTPUTS:

Output-1:

```
Enter the number of orders: 4
Enter the consumer: C6
Enter the quantity (1 to 50): 20
Enter the consumer: C8
Enter the quantity (1 to 50): 40
Enter the consumer: C7
Enter the quantity (1 to 50): 42
Enter the consumer: C5
Enter the quantity (1 to 50): 90
Invalid quantity (90). Quantity should be between 1 and 50. Skipping order for C5.


Delivering orders using CSP solution:

Orders delivered successfully!


Delivering orders using heuristic solution:
Delivering 20 units to C6 via path: ['Warehouse', 'C10', 'C6'] with cost: 8
Truck capacity remaining: 30 units

Delivering 40 units to C8 via path: ['C6', 'C10', 'Warehouse', 'C5', 'C8'] with cost: 20
The truck was refilled to its maximum capacity at the warehouse since it is present on the way.
Truck capacity remaining: 10 units

Delivering 42 units to C7 via path: ['C8', 'C5', 'Warehouse', 'C2', 'C7'] with cost: 16
The truck was refilled to its maximum capacity at the warehouse since it is present on the way.
Truck capacity remaining: 8 units

All orders delivered successfully!
```

Output-2:

```
Enter the number of orders: 3
Enter the consumer: C10
Enter the quantity (1 to 50): 51
Invalid quantity (51). Quantity should be between 1 and 50. Skipping order for C10.

Enter the consumer: C5
Enter the quantity (1 to 50): 40
Enter the consumer: C6
Enter the quantity (1 to 50): 10

Delivering orders using CSP solution:

Orders delivered successfully!


Delivering orders using heuristic solution:
Delivering 40 units to C5 via path: ['Warehouse', 'C5'] with cost: 9
Truck capacity remaining: 10 units

Delivering 10 units to C6 via path: ['C5', 'Warehouse', 'C10', 'C6'] with cost: 17
The truck was refilled to its maximum capacity at the warehouse since it is present on the way.
Truck capacity remaining: 40 units

All orders delivered successfully!
```

Output-3:

```
Enter the number of orders: 4
Enter the consumer: C2
Enter the quantity (1 to 50): 49
Enter the consumer: C3
Enter the quantity (1 to 50): 50
Enter the consumer: C5
Enter the quantity (1 to 50): 40
Enter the consumer: C9
Enter the quantity (1 to 50): 35

Delivering orders using CSP solution:

Orders delivered successfully!


Delivering orders using heuristic solution:
Delivering 49 units to C2 via path: ['Warehouse', 'C2'] with cost: 3
Truck capacity remaining: 1 units

Truck does not have sufficient capacity to fulfill the order for C3. Refilling at the warehouse.
Delivering 50 units to C3 via path: ['C2', 'Warehouse', 'C2', 'C7', 'C3'] with cost: 12
Truck capacity remaining: 0 units

Delivering 40 units to C5 via path: ['C3', 'C7', 'C2', 'Warehouse', 'C5'] with cost: 18
The truck was refilled to its maximum capacity at the warehouse since it is present on the way.
Truck capacity remaining: 10 units

Delivering 35 units to C9 via path: ['C5', 'Warehouse', 'C2', 'C7', 'C9'] with cost: 14
The truck was refilled to its maximum capacity at the warehouse since it is present on the way.
Truck capacity remaining: 15 units

All orders delivered successfully!
```

Output-4:

```
Enter the number of orders: 5
Enter the consumer: C3
Enter the quantity (1 to 50): 20
Enter the consumer: C2
Enter the quantity (1 to 50): 30
Enter the consumer: C4
Enter the quantity (1 to 50): 45
Enter the consumer: C7
Enter the quantity (1 to 50): 6
Enter the consumer: C8
Enter the quantity (1 to 50): 15

Delivering orders using CSP solution:

Orders delivered successfully!


Delivering orders using heuristic solution:
Delivering 20 units to C3 and 6 units to C7 via path: ['Warehouse', 'C2', 'C7', 'C3'] with cost: 9
Truck capacity remaining: 24 units

Truck does not have sufficient capacity to fulfill the order for C2. Refilling at the warehouse.
Delivering 30 units to C2 via path: ['C3', 'C7', 'C2', 'Warehouse', 'C2'] with cost: 12
Truck capacity remaining: 20 units

Truck does not have sufficient capacity to fulfill the order for C4. Refilling at the warehouse.
Delivering 45 units to C4 via path: ['C2', 'Warehouse', 'C2', 'C4'] with cost: 9
Truck capacity remaining: 5 units

Delivering 15 units to C8 via path: ['C4', 'C2', 'Warehouse', 'C5', 'C8'] with cost: 18
The truck was refilled to its maximum capacity at the warehouse since it is present on the way.
Truck capacity remaining: 35 units

All orders delivered successfully!
```