Here are the exercises given in the document for practicing kruskal's and prim's algorithm. The solution just contains general steps you need to follow, but you need to write the actual steps for each exercise as we have studied in the class.

Practice Exercise 1

An Adjacency Matrix Representation of an undirected weighted graph is given below.
Draw the graph represented by the adjacency matrix.
Find the Minimum Spanning Tree (MST) using:
i) Kruskal's Algorithm
ii) Prim's Algorithm

V	0	1	2	3	4	5	6
0	0	2	4	0	0	0	0
1	2	0	1	0	0	0	0
2	4	1	0	5	0	0	0
3	0	0	5	0	6	7	0
4	0	0	0	6	0	8	0
5	0	0	0	7	8	0	9
6	0	0	0	0	0	9	0

Solution for Exercise 1

1. Graph Representation:
   Draw the undirected weighted graph using the adjacency matrix. Each non-zero value represents an edge with its weight.

2. Kruskal's Algorithm Steps:

   o **List all edges and their weights.**
   o **Sort edges by weight: (1, 2), (0, 1), (2, 3), (3, 4), (4, 5), (5, 6).**
   o **Use the union-find method to construct the MST by selecting the smallest weight edges while avoiding cycles.**

   MST Edges:

   o **(1, 2), (0, 1), (2, 3), (3, 4), (4, 5)**
   o **Total Weight = 21**
3. Prim's Algorithm Steps:

   o **Start from vertex 0.**
   o **Add the smallest edge connecting an included vertex to an unvisited vertex.**

o **Continue until all vertices are included.**

MST Edges:

o **(0, 1), (1, 2), (2, 3), (3, 4), (4, 5)**
o **Total Weight = 21**

Practice Exercise 2

An Adjacency List Representation of an undirected weighted graph is given below.
Draw the graph represented by the adjacency list.
Find the Minimum Spanning Tree (MST) using:
i) Kruskal's Algorithm
ii) Prim's Algorithm

Adjacency List Representation:

- Vertex 0: [(1, 3), (3, 1)]
- Vertex 1: [(0, 3), (2, 5), (3, 4)]
- Vertex 2: [(1, 5), (4, 6)]
- Vertex 3: [(0, 1), (1, 4), (4, 2)]
- Vertex 4: [(2, 6), (3, 2)]

Solution for Exercise 2

1. Graph Representation:
   Draw the undirected weighted graph using the adjacency list. Each pair represents a neighboring vertex and the weight of the edge connecting them.

2. Kruskal's Algorithm Steps:

   o **List all edges and their weights: (0, 1, 3), (0, 3, 1), (1, 2, 5), (1, 3, 4), (2, 4, 6), (3, 4, 2).**
   o **Sort edges by weight: (0, 3), (3, 4), (0, 1), (1, 3), (1, 2), (2, 4).**
   o **Use the union-find method to construct the MST by selecting the smallest weight edges while avoiding cycles.**

   MST Edges:

   o **(0, 3), (3, 4), (0, 1), (1, 2)**
   o **Total Weight = 11**

3. Prim's Algorithm Steps:

   o **Start from vertex 0.**
   o **Add the smallest edge connecting an included vertex to an unvisited vertex.**
   o **Continue until all vertices are included.**

   MST Edges:

   o **(0, 3), (3, 4), (0, 1), (1, 2)**

o   **Total Weight = 11**