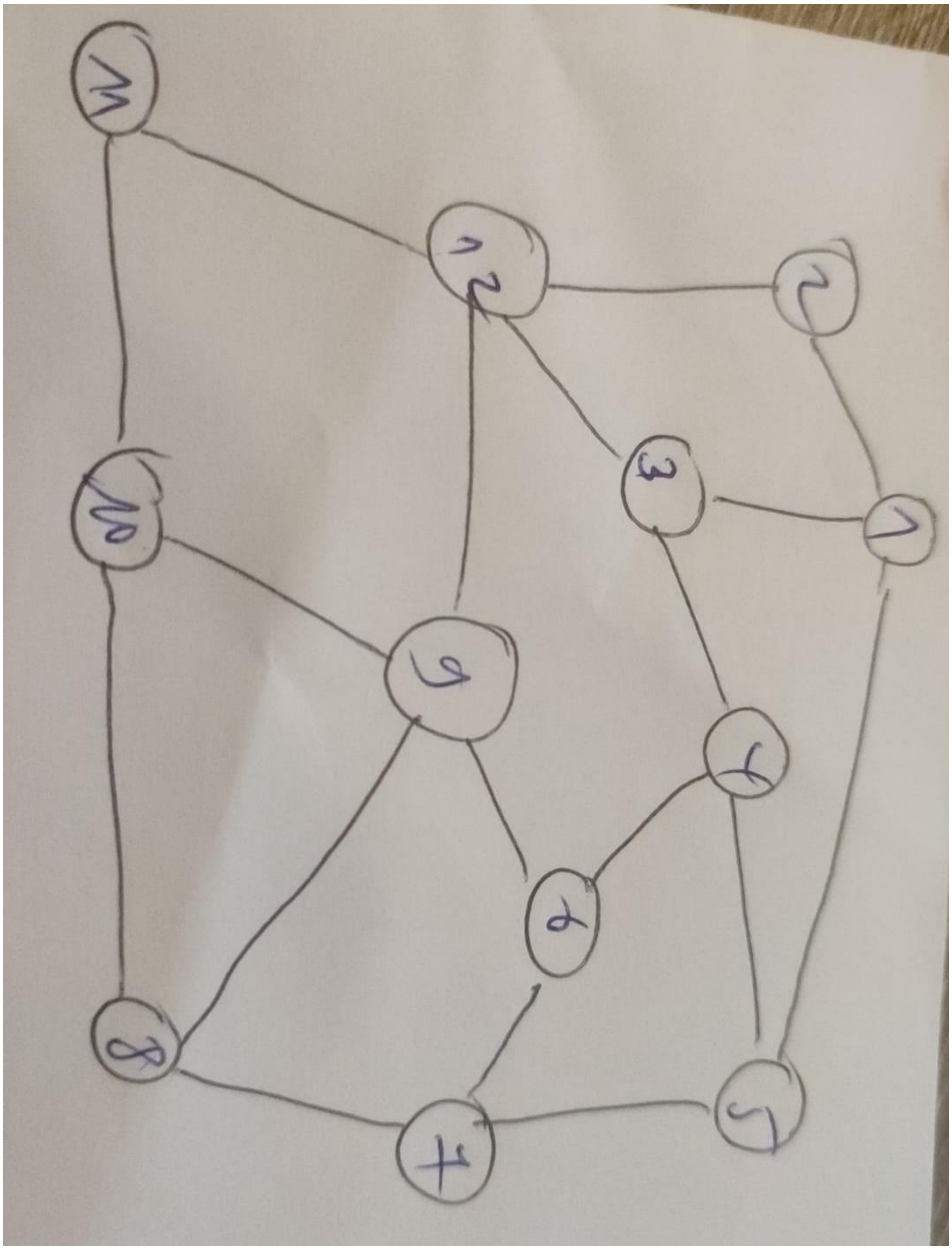
Assignment 12

R-6.1

A simple undirected graph G with 12 vertices, 18 edges, and 3 connected components could look like this:



it's impossible to have 66 edges with 3 components

↳ if G has 12 Vertices & 66 Edges this will be representing a whole graph:

complete graph with n vertices calculated by:

$$\frac{n(n-1)}{2}$$

$n = 12$:

$$\frac{12(12-1)}{2} = \frac{12 \times 11}{2} = 66$$

→ all the Vertices will be connected to each others.

R-6.7

a. **Adjacency List**

- The graph is sparse, meaning it has fewer edges than the maximum possible number of edges (n(n-1)/2).

- An adjacency list is more space-efficient for sparse graphs because it only stores the edges that exist.

b. **Adjacency Matrix**

- The graph is dense, meaning it has a large number of edges.

- An adjacency matrix is more efficient for dense graphs because it provides constant-time access to determine if two vertices are adjacent.

c. **Adjacency Matrix**

- The adjacency matrix allows for constant-time adjacency queries, making it the best choice for this scenario.