

Examples B.1: Example for Graphs of Traditional Data Structure

The nodes are numbered from 0 to 4, and the edges are: (0,1,5), (1,4,5), (2,4,9), (3,4,10).

Examples B.2: Example of C_G

```
import re
import networkx as nx
# Graph description
graph = "(0,1,5) (1,4,5) (2,4,9) (3,4,10)"
# Regular expression to extract edges with weights
pattern = r'\((\d+),(\d+),(\d+)\)'
matches = re.findall(pattern, graph)
# Create an undirected graph
G = nx.Graph()
# Add edges with weights to the graph
for node1, node2, weight in matches:
    G.add_edge(int(node1), int(node2),
               weight=int(weight))
```

Examples B.3: Example for Graphs of Real-Life Scenarios

In an academic collaboration network, the participants are Dr. Emily Carter, Prof. Samuel Lee, Dr. Aisha Patel, Dr. Michael Brooks, and Dr. Laura Martinez. Their collaborations are as follows:

- Dr. Emily Carter collaborates with Prof. Samuel Lee and Dr. Aisha Patel.
- Prof. Samuel Lee also collaborates with Dr. Aisha Patel.
- Dr. Aisha Patel works closely with Dr. Emily Carter and Prof. Samuel Lee.
- Dr. Michael Brooks collaborates with Dr. Emily Carter and Dr. Aisha Patel.
- Dr. Laura Martinez collaborates with Dr. Michael Brooks.

Examples B.4: Example of \mathcal{R}_G

Steps for obtaining edge list:

1. Dr. Emily Carter collaborates with Prof. Samuel Lee and Dr. Aisha Patel.

- Edge: (Dr. Emily Carter, Prof. Samuel Lee)

- Edge: (Dr. Emily Carter, Dr. Aisha Patel)

2. Prof. Samuel Lee also collaborates with Dr. Aisha Patel.

- Edge: (Prof. Samuel Lee, Dr. Aisha Patel)

3. Dr. Aisha Patel works closely with Dr. Emily Carter and Prof. Samuel Lee.

- Edge: (Dr. Aisha Patel, Dr. Emily Carter)

- Edge: (Dr. Aisha Patel, Prof. Samuel Lee)

.... (Remaining steps are omitted)

Resulting edge list:

```
[
    ('Dr. Emily Carter', 'Prof. Samuel Lee'),
    ('Dr. Emily Carter', 'Dr. Aisha Patel'),
    ('Prof. Samuel Lee', 'Dr. Aisha Patel'),
    ('Dr. Aisha Patel', 'Dr. Emily Carter'),
```

```
( 'Dr. Aisha Patel', 'Prof. Samuel Lee'),
('Dr. Michael Brooks', 'Dr. Emily Carter'),
('Dr. Michael Brooks', 'Dr. Aisha Patel'),
('Dr. Laura Martinez', 'Dr. Michael Brooks')
]
```