Overview

- represent logic statements
- structure consisting of nodes/vertices and edges
  - edges and nodes can have labels
    - labelled graph
    - unlabelled graph
  - edges can have direction
    - directed graph
    - undirected graph
- some knowledge can be well represented as graph
- further details [[Graphentheorie]]

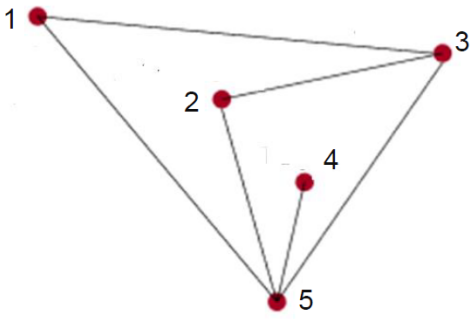
Adjacency Matrix

- represents distance/adjacency between all nodes of a graph

Graph representation as adjacency matrix

Adjacency matrix A
- i = row-index
- j = column-index
- A(i,j) = number of edges e(i,j)
- Uniquely represents the graph

	1	2	3	4	5
1	0	0	1	0	1
2	0	0	1	0	1
3	1	1	0	0	1
4	0	0	0	0	1
5	1	1	1	1	0



Use Cases

- Shortest Path
  - determine shortest path between two nodes in grap
  - minimise weight of constituent edges
- Centrality
  - determine most influential nodes in graph
  - different types of centrality depending on use case

- degree centrality
  - number of incoming connections
- closeness centrality
  - the closer to all other nodes the more central

$$CC(x) = \frac{N}{\sum_y d(y,x)}$$

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[[Knowledge Representation]]