networks and graphs lecture 1

degree sequence; list of ordered degrees of vertices

sequence of numbers is graphic if the degree sequence is of a simple graph.

> *method:*

representing graphs

adjacency matrix

rows and columns are populated by vertices

> *properties:*
>
> *matrix is symmetric*
>
> *if graph is simple all numbers must be at-most 1 or 0*
>
> *sum of numbers on row or column is the degree of that vertex*

incidence matrix

rows are populated vertices and the columns are populated by the edges

> *properties:*
>
> *sum of columns must be 2*
>
> *sum of row is the degree of that vertex*

sometimes one representation is better than the other one:

is there an edge between 2 vertices, adjacency matrix is better: just check if there is a non zero number at the intersection in the matrix

subgraphs

1. all vertices and edges of a subgraph have to belong to the set of the original graph
2. the endpoints of the edges of the subgraph need to end in vertices belonging to the subgraph

or take a subset of a graph such that all vertices are connected by only the edges that are between them, the same holds for the other way around namely:

take a subset of the edges of a graph such that all edges have an end point in a vertex also contained in the subset.