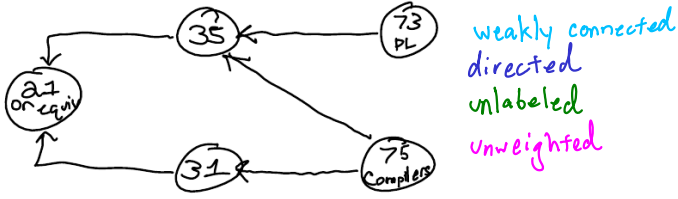


Graphs

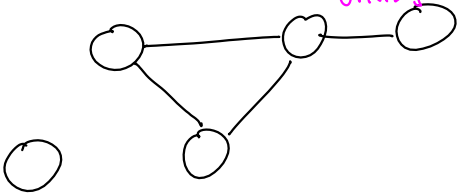


edge as $\langle V, V, W, L \rangle$

Example: Social Networks

V: people
E: friendships

disconnected
undirected
unlabeled
unweighted



A graph is undirected if, for every edge $\langle V_1, V_2 \rangle$ in E , the edge $\langle V_2, V_1 \rangle$ is in E . A graph is directed if it is not undirected.

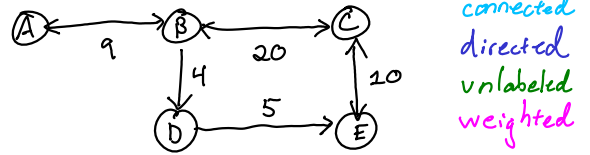


Simple;
no multi-edges
no self-loops



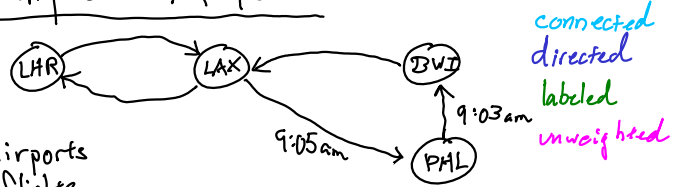
Example: map

V: locations
E: routes between locations
W: weight = how costly a route is



Example: Airports

V: airports
E: flights
L: labels = time of flight



A path is a list of vertices such that each adjacent pair in the list is an edge in the graph.

A graph is connected if, for every pair of vertices V_1 and V_2 , there is a path from V_1 to V_2 .

A graph is weakly connected if it would be connected in its undirected form: