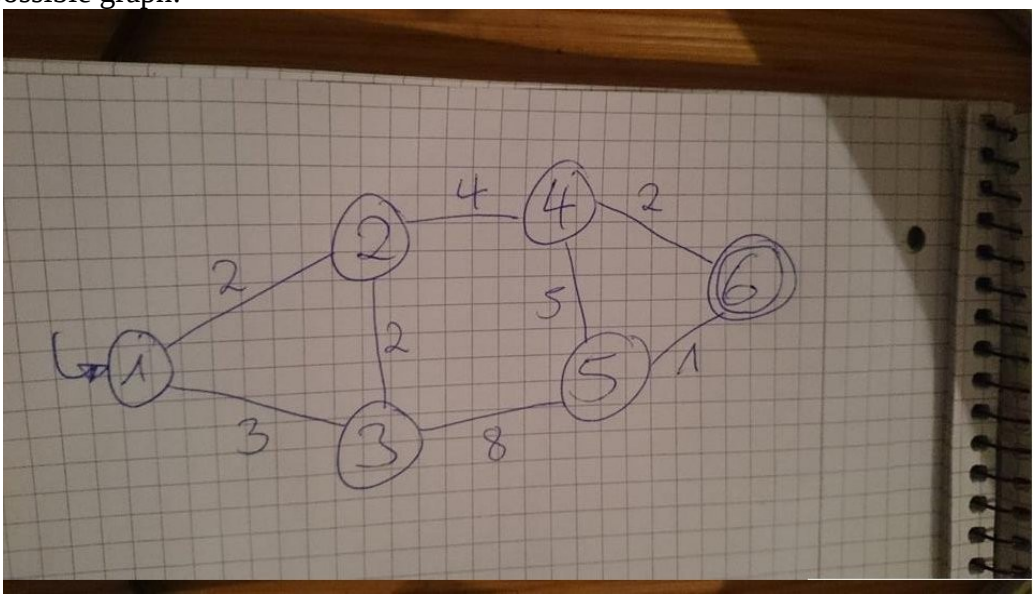
1.1.1
Example: Bus Network.
We assume an undirected (on streets it is possible to drive in both directions) graph. [Also possible: Train network with directed edges.]
The nodes are the bus stops. The edges are the streets. The edges are weighted with the minutes it needs to take the distance between bus stops.
Start node is the start point (bus stop) from a bus guest and end node is the destination bus stop.
We are searching for the shortest way (measured in minutes) to get from start to destination.
Picture of possible graph:



The state space is a set of all possible configurations (all the possibilities to cross the edges), but we want to cross every node only one time and take the shortest way. This is possible with Dijkstra's algorithm (no further explanation, this was topic in mathematics 1 and optimization, so we use this knowledge as presupposed knowledge).