Week 2 - Multi-agent Systems

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Stategy

This weeks goal was to implement a first version of the multi-agent transportation system in which vehicles pick up passengers, travel to the final destination and drop off passengers according to a fixed schedule.

Fixed route All buses start at the same position at "Centraal Station" and follow a fixed route. This route ends where it started, so buses will circulate around the graph. All bus stops are visited at least once in this route with a maximum of two times. (Due to the graph structure of the map, it is impossible to start at any initial position and only visit each station once.) In the iterative process of this assignment it would be interesting to measure the trade-off between: the cost of using multiple buses each with their distinct routes, with average traveling time of passengers.

Multiple buses Every 30 ticks an extra bus is bought with a maximum of 10 buses. Because of the fixed start position of every bus and the delay of 30 ticks, the buses never arrive at the same time at a busstop.

Dropping off passengers At each bus station, for all buses, it is checked if there are passengers with the desire to drop off at the current station. At each bus station it loops through all passengers to make sure we do not miss any.

Picking up passengers Buses can be differentiated by their type. Each type is characterized by the amount of passengers it can take on. After it has dropped off any passengers, all waiting passengers are picked up until the maximum capacity is reached. On arrival at a new busstop, when the maximum capacity of passengers is already reached, and no passenger is at its destination yet, the bus immediately continues to the next busstop.

Next week

The goal is to implement a version in which vehicles exchange messages with each other according to a self-defined protocol/ontology. We are going to implement a BDI approach, in which each bus stores its beliefs about the location of each passenger locally. Buses then share their beliefs to create the emerging information flow of the system.