Experiment 3

Foundations of AI

Dijkstra algorithm

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#R version 4.1.0

#RStudio version 1.4.1717

The basic principle behind the Dijkstra algorithm is to iteratively look at the node with the currently smallest distance to the source and update all not yet visited neighbours if the path to it via the current node is shorter. We try to find the distance of every node of given graph or tree from the starting node using Dijkstra algorithm

- First using rm(list = ls()) clear the environment before executing the code
- We will make a function dijkstra with arguments graph and start
- Graph is an adjacency-matrix-representation of the graph where (x,y) is TRUE if there is an edge between nodes x and y
- Start-> the node to start from.
- The function returns an array containing the shortest distance of every node from the starting node
- We create an array distance and set distance of every node as inf, Set distance of starting node as 0
- While there are nodes left to visit we will find the node with the currently shortest distance from the start node
- Then we will check for all neighbouring nodes that haven't been visited yet
- If the path over this edge is shorter we will save this path as new shortest path.
- We initialize the graph and starting node outside the function and call the function dijkstra