# KI Praktikum 03

### 1. Wooden Railways

- a) Find a connected combination of 32 rail track pieces, categorized into 4 different types, where no overlaps or lose ends occur. *(alternative: Find a combination of all rail tracks where the track forms a unknot like railway.)*
- b) For the problem, I would eighter use Depth-First-Search or Breadth-Frist-Search. The complexity of the problem has a fixed branching factor of 4 and a max depth of 32. Due to the limmited depth of 32 is would use the DFS.
  - Options: Depth first search Breadth first search Iterative deepening search Bidirectional search
- c) The problem with removing one of the fork pieces is, that every fork piece adds a new track but you have to have a second piece to be able to close it again. So you can only remove even numbers of forks.

### 3. *Uniform-Cost-Search == A*-Search*?

How I understood it, Uniform-Cost-Search (cheapest-cost-search) is just a special case of the A*-Search that has a easy heuristic, that sorts the frontier just based on the cheapest path cost. If we set the h() of the A* search to a fixed number like 1, we get an uninformed Uniform-Cost-Search algorithm.

### 6. Explain why the UTILITY of a MAX player using MINIMAX against a unoptimal MIN player will always be higher or equal than against a optimal MIN player.

Its because the MAX player always predicts all possible plays and the selects the best possible outcome if the min player plays optimaly. If the min player doesn't play optimal the margin is most of the time much higher because the min player makes mistakes which lead to higher utility for the max player.