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MATH. - NATURWISS. FAKULTÄT
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Artificial Intelligence

Assignment 10

Assignment due by: 17.1.2018, Discussion: 19.1.2018

Question 1 CSP: Cartographic coloring [4+4=8 points]

The goal in this question is to assign one of the following colors *red (r)*, *green (g)*, or *blue (b)* to each node of a graph so that two adjacent nodes do not have the same color.

  (a) Using this coloring rule, build a graph with four nodes which does not admit any solution. Prove it using **Backtracking-Search**: draw the tree and detail the steps.

  (b) Is it possible to solve this question with less than six edges on the graph? Prove your claim.

Question 2 CSP: n-Queens Problem [2+2+2=6 points]

Consider the problem of placing n queens on an $n \times n$ chessboard such that no two queens are attacking each other. Choose a CSP formulation,

  (a) In your formulation, what are the variables?

  (b) What are the possible values of each variable (i.e. the domains)?

  (c) Specify the set of constraints.

Question 3 CSP: Heuristics and consistency [2+2+2=6 points]

  (a) Name two different heuristics used for CSP and briefly detail their concept.

  (b) Explain why it is a good heuristic to choose the variable that is most constrained but the value that is least constraining in a CSP search.

  (c) Explain the difference between arc consistency and path consistency.