

CS 475 — Artificial Intelligence I — Spring 2007

Homework 1

Consider the 3-coloring problem:

You are given a map with countries/states and their borders (e.g., a map with all countries in the world and the borderlines between them) and three colors (red, blue, green). The goal is to color the map in such a way that every two countries/states, which share some border, are colored by different colors.

Please do the following:

- Formalize the problem as a graph searching problem. To do this, you should represent the problem as a directed graph and explain
 - what does a node represent?
 - what does an edge represent?
 - what is the starting node and what is (are) the end nodes
- Take the Southwest Map of the USA with the states: Arizona, California, Colorado, New Mexico, Texas, Utah, and Nevada and show the nodes that are generated by the search algorithm using the strategy
 - the breadth-first search
 - the depth-first search

to get one possible coloring of this map. Note that if two states sharing only one point, then we say that they do not have a shared border (e.g. Colorado and Arizona does not share border). A map can be found in www.50states.com/us.htm.