Project (100p)

Due: Tue. Dec. 2 at 11:59pm

Note: You will do this project in groups of 3 people. If your group has 4 members you will need to do some extra work.

Your assignment will be to write a Lisp program to solve the Map-Coloring problem using cutset conditioning method. The objective is to color a map using as few colors as possible. The method is described in the textbook. After a cutset is removed from the graph the remaining map will be a tree that can be easily colored using an $O(n)$ method described in the book. To color the cutset you need to attempt all possible colorings using the method from Homework #3.

You will use the greedy algorithm (GA) described in the "Approximation Algorithms for the Loop Cutset Problem" paper which was posted in the General Resources. You should assume that all edges have unit (1) weight. If your group has 4 members you should implement the modified greedy algorithm (MGA) described in the paper. To compute cycles you should use the method described in *cycles.pdf*.

You are given two maps which you need to color with four colors *(R,G,B,Y)* using your method. To make sure that your method works you should test it on the maps from Homework #3. The first map *states.cl* is an assoc list representing the map of the United States. The second map *countries_input.lsp* shows the map of the world. [It was created by Nathan Obert from the Wikipedia list.] Note that the countries are represented by their names as unique strings. The output of your program should be a list of pairs (*country/state color*).

Instructions for submission:
Send a SINGLE email to cs580ta@cs.gmu.edu formatted in the following way:

- the subject field of the email should read: CS580 Project Duric
- the content of the email should be a tar or a zip file containing: (i) commented version of the Lisp code for your Project; comments at the top should include:

  Group member names

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  Dr. Duric

  Project

  Within the code you should include comments documenting the contributions of the group members. (ii) a dribble file file showing testing of your code on the two maps, and (iii) assoc list with the maps of the USA and the world.

As a safety precaution, always CC yourself when you submit homework this way and keep it around until it has been graded and returned.

Final note: we will test all code using **MOSS**.