Project description:

Our team tries to solve the ancient Chinese mathematic problem magic square and magic circle, please visit this link to see the detail rules of the problem: https://en.wikipedia.org/wiki/Magic_circle_(mathematics)

In middle school, some tricky ways are taught to solve this problem. However, it only provided one trivial answer and does not work when the condition is changed slightly. After studied the CSP section of CSC384, we believe all different magic squares and magic circles could be solved systematically since all its restrictions could be transferred to CSP constraints. Thus, we want to implement the CSP model to this ancient Chinese problem to see how it works.

In detail, we want to the hardest problem in magic circle/square variations which is called “Yang Hui Magic Nine circles in a square”. See this link for the rule of “Yang Hui Magic Nine circles in a square”:https://en.wikipedia.org/wiki/Magic_circle_(mathematics)#Yang_Hui_Magic_Nine_circles_in_a_square. It is quite challenging because of the complicated rules and myriad permutations of possibilities.

Moreover, we would find the most efficient way to solve the three problems by applying different model and by using forward check and general arc consistency. The process should work similar to Assignment 2.

Evaluation Plan:

We will build several models for this problem based on different interpretations. we would test our solution by both given a set of fixed value and initiate the search with a blank board. The solution could easily be checked based on the rule given and we would record the time to see how different models/ check techniques work.

Roles of team members: Member A and B are mainly charged for building the model, since the problem has very complicate rules, we assume the model would be much harder than the one we did in A2, so we need two people for that. Member C is responsible for implementing different checking techniques to models built by member A/B and write test cases to check is the solution provided is correct.