



DEPARTMENT *of* COMPUTING

College of Business & Technology

EAST TENNESSEE STATE UNIVERSITY

CSCI 5260 – ARTIFICIAL INTELLIGENCE

LAB 5 – CONSTRAINT SATISFACTION WITH EIGHT QUEENS

OVERVIEW

The eight queens problem is a classic illustration of constraint satisfaction. The problem says that you should place eight queens on an 8x8 chessboard such that no queen can capture another. When placed row-by-row, the possible placements in the next rows are constrained by each placement. If you have a position to place a queen in each row, you've found a solution. This problem is generalized as the n-queens problem.

BACKTRACKING CODE EXPLORATION

Download the **lab5.py** file from the D2L dropbox. The code requires the following libraries:

1. os
2. random
3. sys
4. time

BACKTRACKING ALGORITHM UNDERSTANDING

1. Examine the code. Explain how the code is behaving within the context of this particular problem.
2. Now that you have investigated the code, specify the problem in terms of the following:
 - a. Variables
 - b. Domains
 - c. Constraints
3. Explain the idea of propagating constraints and unpropagating constraints in the n-Queens problem provided. Why is unpropagating constraints necessary?

CONSISTENCY

4. Explain the following terms.

Node Consistency
Arc Consistency
Path Consistency
5. Does the provided code maintain arc consistency? If not, explain how you could maintain arc consistency in the n-Queens problem.

SUBMISSION

Create a Word Document named **SurnameLab5.docx** with your responses above.

Submit to the Lab 5 dropbox at or before Monday, February 22, 2021 by 11:59 PM.

GRADING

A letter grade will be assigned for each response. The letter grades are based on both correctness and the adequacy of answers. Points are assigned as follows:

		A	B	C	D	F	Zero
		Excellent	Above Average	Average	Below Average	Poor	No Attempt
		10	8	6	4	2	0
Backtracking	Q1						
	Q2						
	Q3						
Consistency	Q4						
	Q5						