# Assignment #4: Simulated Annealing
# Due November 17, 2016 by midnight
# CS 335 Introduction to Artificial Intelligence
# Fall 2016
# Northeastern Illinois University
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- This assignment consists of two java files. First on is the SimulatedAnnealing.java and the second one is Node.java.
- Node.java contains the methods and variables for possible states in 8 queens problem. Current state and possible next states are created using this class. **DO NOT** modify the Node.java.
- SimulatedAnnealing.java already contains an implementation of a Hill Climbing algorithm. It will run, most of the time it will get stuck with a few attacks after optimizing the board. Occasionally it reaches 0 attacks.
- You must focus modify SimulatedAnnealing.java to run simulated annealing algorithm. To do that, you should add your code to places that marked with comments *//Your code here…* .
- There are two places you must modify, first one is inside the loop of the program where a worse possible next state is generated and the second part is the *ProbabilityAcceptance(double deltaE, int temperature)* method.
- *ProbabilityAcceptance(double deltaE, int temperature)* method will calculate the accepting probability of a worse state and return either a true or false value. If a true value is returned, the possible next state must be accepted.
- For the *ProbabilityAcceptance(double deltaE, int temperature)* method :

  -You must have a double probability weight value k

  -k will have a constant value depending on temperature

  -For temperatures above 5000, k must be 0.2

  -For temperatures between 2500 and 5000 k must be 0.1

  -For temperatures between 100 and 2500 k must be 0.05

  -For temperatures under 100 k must be 0.

  -Multiply k with deltaE to find acceptance probability (Do not use -Math.exp(), values are way too sensitive that way, stick with the formula I gave you above to calculate probability).