

**You are only allowed to use Java, C#, or C++**

**Project Description:**

Local search algorithms are very efficient in solving n-Queen problems (where  $n = 21$ ). You must implement the following two algorithms to solve the n-queen problem:

**1) Steepest-ascent hill climbing.**

**2) Genetic algorithm**

**Analysis:**

For analysis, you should generate a large number of n-queens instances ( $>100$ ) and solve them. Measure the percentage of solved problems, search costs and the average running time. Explain why you get such results, for example, why the algorithm can only solve the percentage of the problems that it did. Explain the difficulties you experienced while implementing the algorithms. If you have taken steps to increase the speed of your implementation, note that as well.

**What to Submit:**

**Project report** (your approach + analysis + findings,  $<3$  page in pdf format).

**Source code + README** (how to compile and run your code. **Do not assume that the grader will use your IDE. You need to instruct the grader on how to compile and run your program from the command line**).

**Program output:** sample solutions (at least 3 different solutions per algorithm). You just need to show the final configuration, the solution path doesn't need to be included.

**How to Submit:**

Create a folder called, "lastname\_firstname\_420p2", that includes all of the required files, from which, you should generate a zip file called "lastname\_firstname\_420p2.zip". For example, if Jane Doe was submitting a project, she would name the folder doe\_jane\_420p2. The resulting zip file would be named, doe\_jane\_420p2.zip. Submit this file via Blackboard before the due date.

**No late submissions will be accepted**