



CIS 263 Introduction to Data Structures and Algorithms

Backtracking



Optimization Problems

Greedy Algorithms

- Mainly Heuristics based

Bruteforce

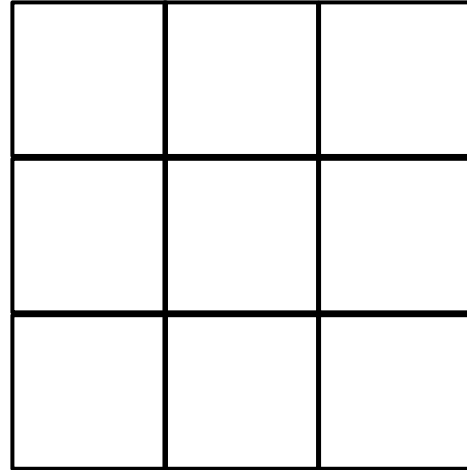
- Constraints based
- Backtracking



N-Queens problem

- N Queens cannot be on the same row/column/diagonal
- Can we have a valid solution (placement of all 3 queens)?

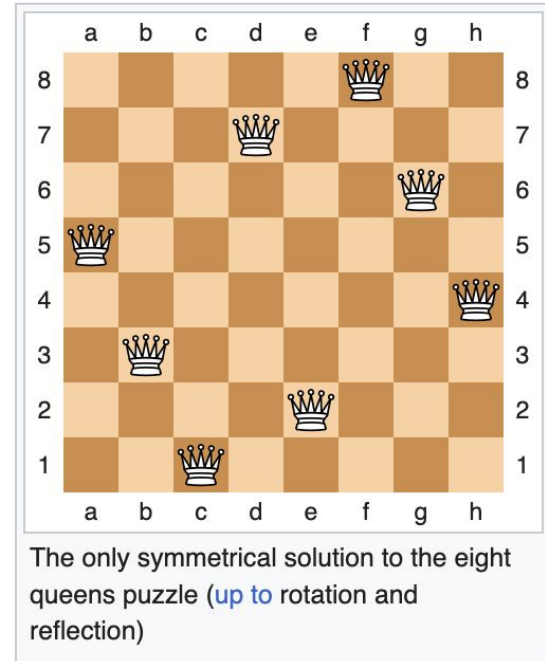
Q1, Q2, Q3



N-Queens problem

- N Queens cannot be on the same row/column/diagonal
- What are the valid options on a chess board of placing 8 queens
- Also known as 8 Queens problem.

Q1, Q2, Q3, .. Q8



[Src: wikipedia](https://en.wikipedia.org/wiki/Eight_queens_puzzle)



N-Queens problem

- We can use backtracking algorithm
 - Bounding function
 - No two Queens can be on the same row, column or on the diagonals
- Question: How many possibilities we have to search if Bruteforce search (without any condition) is applied ?