

# Local Search and CSP

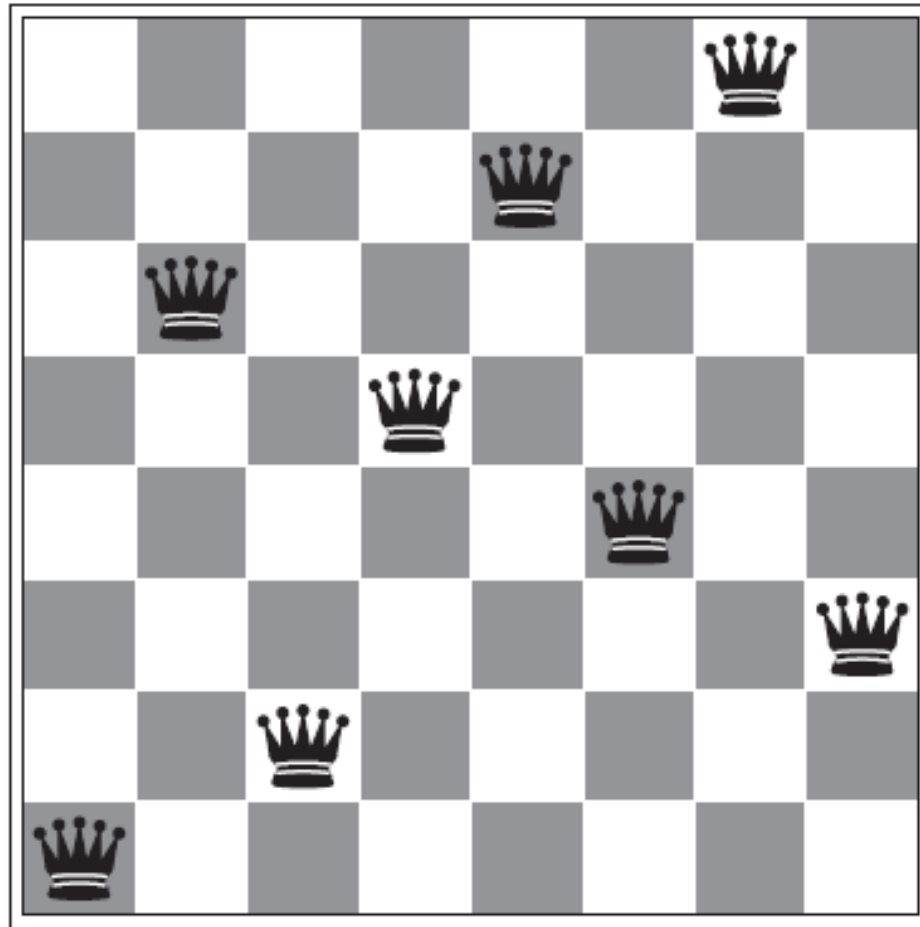
CS161

Guy Van den Broeck

# Local Search

- Sometimes the path to the goal is irrelevant
- Only final configuration matters
  - n-queens, circuit design, road network, cryptarithmic, rubik, sliding tile, TSP?
- Modify a single current node
- Good for optimization problems
  - objective function

# Hill-Climbing Search



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18	12	14	13	13	12	14	14
14	16	13	15	12	14	12	16
14	12	18	13	15	12	14	14
15	14	14	♠	13	16	13	16
♠	14	17	15	♠	14	16	16
17	♠	16	18	15	♠	15	♠
18	14	♠	15	15	14	♠	16
14	14	13	17	12	14	12	18

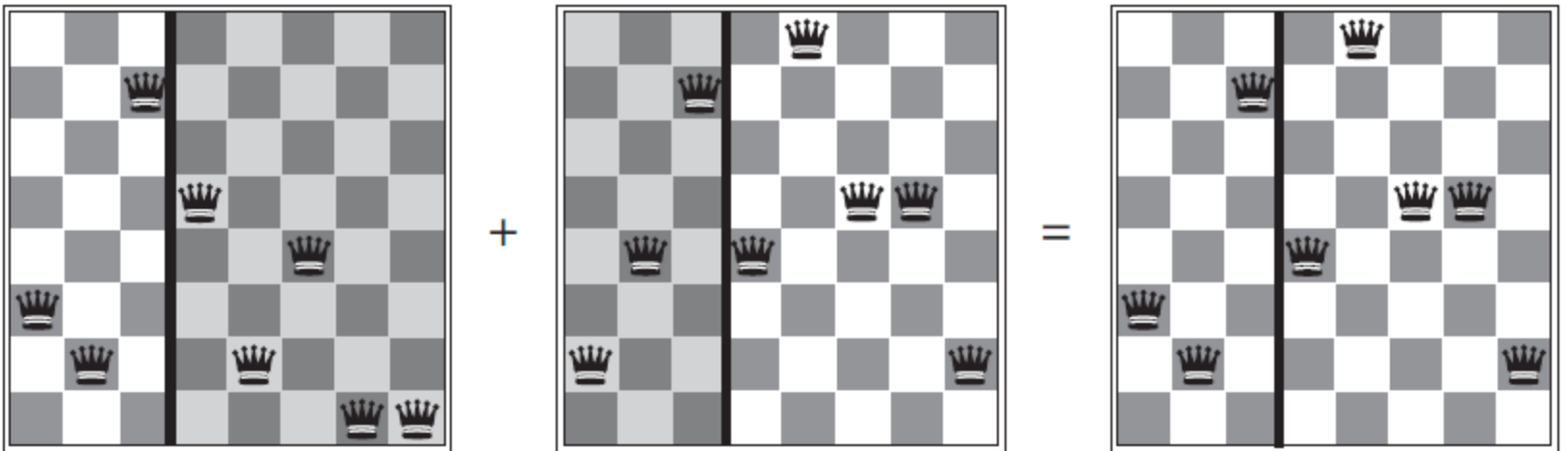
# How to locally modify TSP?

# Simulated Annealing

- Randomly select candidate successor
- Go there if better
- Else go there with probability  
function of “energy” and “temperature”



# Genetic Algorithms



24748552

32752411

24415124

32543213

(a)

Initial Population



