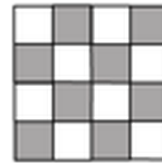


SEARCH APPLICATIONS

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CS30 – Spring 2015

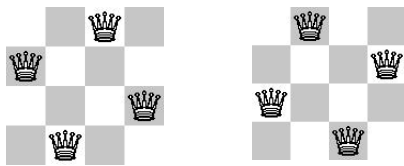
## N-queens problem

Place  $N$  queens on an  $N$  by  $N$  chess board such that none of the  $N$  queens are attacking any other queen.



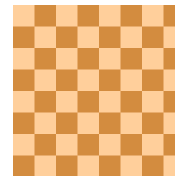
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## N-queens problem

Place N queens on an N by N chess board such that none of the N queens are attacking any other queen.

How do we solve this with search:

What is a state?

What is the start state?

What is the goal?

How do we transition from one state to the next?

## Search algorithm

add the start state to to\_visit

Repeat

- take a state off the to\_visit list
- if it's the goal state Is this a goal state?
  - we're done!
- if it's not the goal state What states can I get to from the current state?
  - Add all of the successive states to the to\_visit list

Any problem that we can define these two things can be plugged into the search algorithm!

## N queens problem

[http://en.wikipedia.org/wiki/Eight\\_queens\\_puzzle](http://en.wikipedia.org/wiki/Eight_queens_puzzle)

## Missionaries and Cannibals

Three missionaries and three cannibals wish to cross the river. They have a small boat that will carry up to two people. Everyone can navigate the boat. If at any time the Cannibals outnumber the Missionaries on either bank of the river, they will eat the Missionaries. Find the smallest number of crossings that will allow everyone to cross the river safely.

What is the "state" of this problem (it should capture all possible valid configurations)?