

Final Exam

- Tuesday at 7:50
- Take home due at the final
- In-class Exam 2 replacement option

Problem Solving as Search

- Many problems have a solution space that can easily be thought of as a directed graph or a tree
- We can solve problems of this type by searching for the optimal solution in the space of possible solutions (the **solution space**)

Implicit Trees/Graphs

- Note that we do NOT have to construct the graph of the entire solution space
- We only need a procedure for finding the next set of nodes

Backtracking

- Essentially, depth-first search in a solution space which can be represented as a directed graph
- When we discover that the current node does not produce the solution we want, we backtrack to a node where we can make an alternate decision and proceed from there

Backtracking Method Steps

- Define the solution space
- Organize the space appropriately to search in
- Search depth-first using bounding functions to avoid searching uninteresting parts of the space

Container Loading

- Now have 2 ships with capacities c_1 and c_2
- We have n containers, each with a specified weight
- We want to determine whether we can load all of the containers onto the two ships, and the distribution of containers if we can

Bounding Functions

- We need to recognize infeasible solutions
- We need to recognize bad solutions

N-Queens

- Placing a set of N queens on an $N \times N$ board such that no two queens are attacking each other.

Review Questions?

Last Words