

Homework 1

Blind Search

Due: 5:00pm on 2/11/08

Problem 1.1

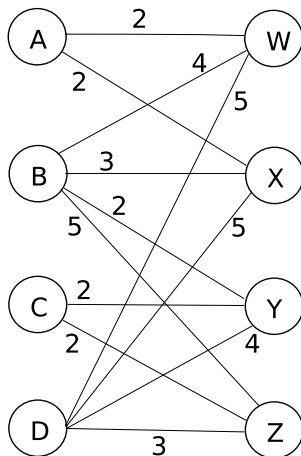
Do problem 3.8 from the book. When considering iterated deepening, please report those states visited multiple times as such (i.e., *don't* report only the *first* time the node is visited.)

This problem asks you to consider bidirectional search, which often allows for more efficient solutions to search problems by limiting the apparent depth of the search tree. Essentially, instead of just starting at the initial state, you also start at each of the explicitly-defined goal states and walk backwards via a “predecessor function.” For more information, check out pages 79 – 80. For Depth-Limited search, take the root node to have depth 1, such that a Depth-Limit 1 search explores the root and nothing else.

Problem 1.2

Imagine you have the tower of hanoi problem again, but this time there are four pegs on which you can stack disks. Your problem now is to move a stack of four discs from the leftmost peg to the rightmost. Give a shortest series of legal moves such that the pile on the leftmost pile is moved to the rightmost pile. Prove your solution is optimal.

Problem 1.3



Sello Construction has 4 backhoes and 4 projects that need backhoes. Backhoes don't get very good gas milage, so Sello Construction has hired you to minimize its gas costs. The goal is to match each of the backhoes A-D with a construction site W-Z. Every backhoe must be matched

with exactly one site. Each edge is labeled with a number that represents the cost of using that edge in the matching. You want to minimize the cost of the matching so that Sello Construction saves money and wants to hire you again. What is the optimal matching? How do you know it is optimal? Please show work.