

CSCI 262 Lecture 9 – Recursion, part 2

Outline

- Recursive thinking
 - Find recursive decomposition – how would solving smaller problems help us solve the original?
 - What is the base case?
- Top-down or bottom-up approaches to looking for the recursive solution
- Backtracking – an application of recursion for exhaustively searching through all possible solutions
- Minimax – an application of recursion to solving perfect-knowledge two-player games

For Further Practice

1. For project 2, you are solving mazes using stacks and queues. As discussed in the lecture on stacks and queues, the stack approach is one implementation for doing depth-first search. Another is the backtracking algorithm from this lecture (which *implicitly* uses a stack – the function call stack!) Try writing a recursive maze solver – you'll need to throw away much of the existing code!
2. Implement a perfect Nim game player, then print out whether player 2 or player 1 wins (if playing perfectly) for numbers of tokens up to 21. Is there a pattern? Can you explain it?