CS4618 Artificial Intelligence I
Term 2012/2013, 1st Period
http://www.cs.ucc.ie/∼tj2/cs4618/

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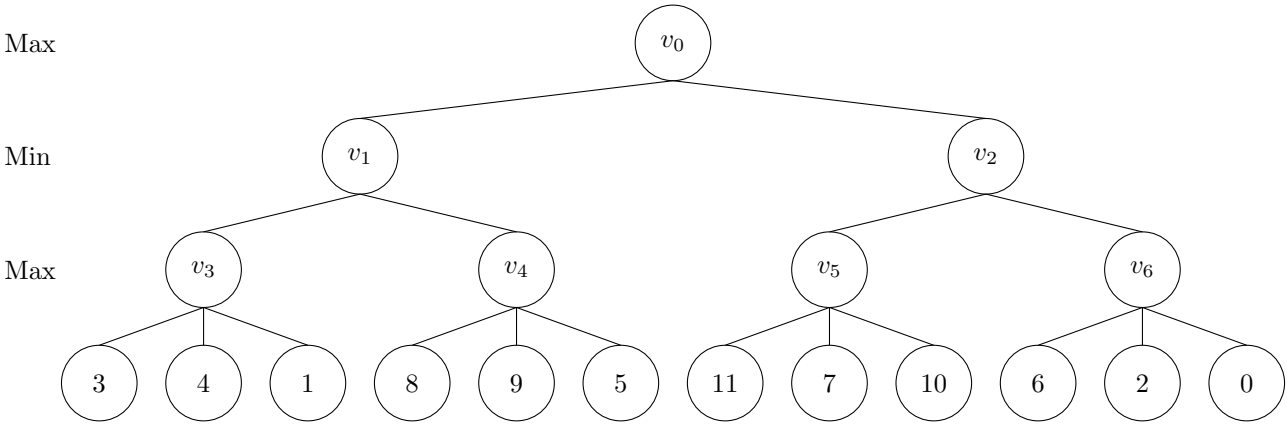
Assignment 3

Topic 'Adversarial Search'

Problem 1 Consider the games of draughts, Chinese checkers, and backgammon. For each of the three games, classify it and explain **briefly** what approach you would suggest to implement a program that is capable of playing the game. Give reasons for your suggestions.

Problem 2 Consider the game tree given below.

1. Evaluate it completely and write down the value for each of the nodes $v_0, v_1, \ldots, v_6$.
2. Assume that in each node the possible moves are considered from left to right. Which nodes are not considered if alpha beta pruning is employed?
3. Assume that in each node the possible moves are considered in an ordering that is defined by their quality, starting with an optimal move. Write down the complete sequence of considered nodes in the ordering they are considered if alpha beta pruning is employed. Which nodes are not considered? Is there another ordering of moves that leads to an even smaller number of considered nodes?



Problem 3 **Implementation Task**
Implement a program that plays Take(n, k). The program should be able to play against a human opponent and against itself. The values for n and k are given as parameters and the program should work (at least in principle) for arbitrary values of $n, k \in \mathbb{N}$ with $n \geq k$. Implement alpha-beta pruning as part of the program and use alpha-beta pruning to compute an optimal move in each situation.

Assignments are handed out on each Friday during the lecture. Written solutions are due the next Wednesday. Feedback is given and solutions are discussed the Wednesday after that.