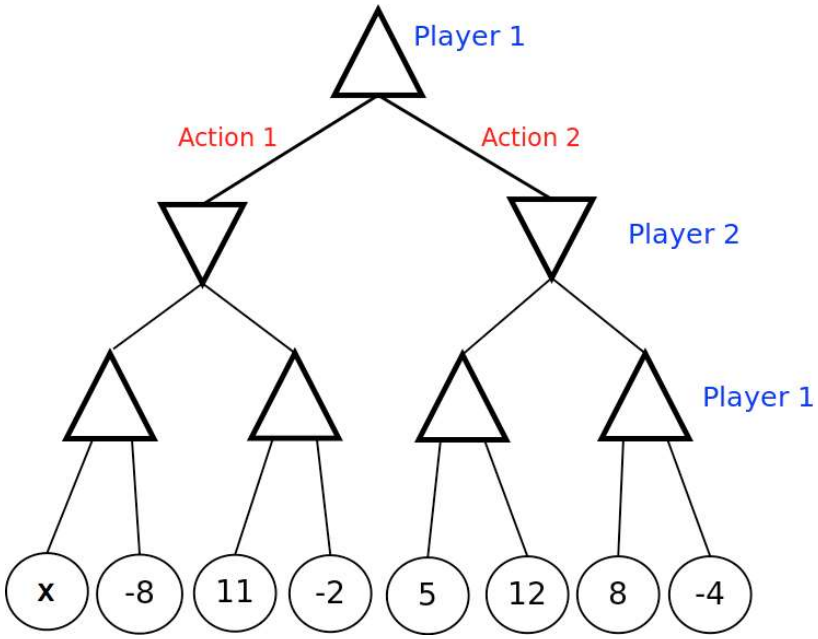
hw3_games_q3_unknown_leaf_value

Question 3: Unknown Leaf Value

8/8 points (ungraded)

Consider the following game tree, where one of the leaves has an unknown payoff, x. Player 1 moves first, and attempts to maximize the value of the game.



Each of the next 3 questions asks you to write a constraint on x specifying the set of values it can take. In your constraints, you can use the letter x, integers, and the symbols > and <. If x has no possible values, write 'None'. If x can take on all values, write 'All'. As an example, if you think x can take on all values larger than 16, you should enter x > 16.

Assume Player 2 is a minimizing agent (and Player 1 knows this). For what values of x is Player 1 *guaranteed* to choose Action 1?

x>8 ✔

Assume Player 2 chooses actions at random with each action having equal probability (and

Player 1 knows this). For what values of x is Player 1 *guaranteed* to choose Action 1?

x>9 ✔

Denote the minimax value of the tree as the value of the root when Player 1 is the maximizer and Player 2 is the minimizer. Denote the expectimax value of the tree as the value of the root when Player 1 is the maximizer and Player 2 chooses actions at random (with equal probability). For what values of x is the minimax value of the tree worth more than the expectimax value of the tree?

None ✔

Is it possible to have a game, where the minimax value is strictly larger than the expectimax value?

- Yes
- No ✔

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✔ Correct (8/8 points)

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