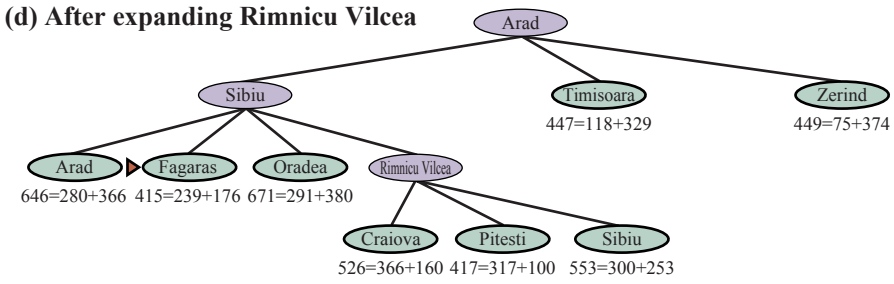
Heuristic Search Review

Artificial Intelligence

1. What is a heuristic function?

2. How do you use best-first search to implement A^* search?

3. In this diagram, nodes are marked with their A^* heuristic values, $f(n) = g(n) + h(n)$. Which node will be the next node expanded by A^*?



4. Define admissible heuristic.

5. Define consistent heuristic.

6. Which important property does an admissible heuristic give A^*?

7. How does using a consistent heuristc improve A^* compared to using an admissible, but not consistent heuristic?

8. Describe three approaches to designing a heuristic function.

9. Use one of the three approaches from the previous question to design an admissible heuristic for the Three Pitchers problem. In the Three Pitchers problem thre are three unmarked pitchers – an 8 L pitcher full of water, an empty 5 L pitcher, and an empty 3 L pitcher – and an agent must reallocate the water so that one of the pitchers contains exactly 4 L of water.