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Tutorial 4

Q2

a) Fagaras → Sibiu → Rimina Vilcea → Craiova

Q3

a)if h(n) is not admissible then h(n) > k(n) where k(n) is true shortest path to goal

Proof by contradiction

1. Assuming h(n) > k(n)
2. Take that C(n,G) = c where C(G) is the cost to goal state from state n
3. h(n) > C(n,G)
4. However, if h(n) is consistent then:

h(n) <= C(G) + h(G) where h(G) = 0

5. Reaches a contradiction, therefore h(n) is admissible

b) Take 8-tile puzzle for example, instead summing number of squares away of every tile but you randomly choose Manhattan distance of only a few tiles. It will still be admissible not inconsistent

c) proven in a)

Q4

a) No. Get stuck in the state:

1 2 8
4   3
7 6 5

b)

Actions

* 2 8		2 8 *		2 8 3		2 8 3		2 8 3		2 8 3		* 8 3		8 * 3		8 1 3		8 1 3		* 1 3
1 4 3	→	1 4 3	→	1 4 *	→	1 * 4	→	* 1 4	→	* 1 4	→	2 1 4	→	2 1 4	→	2 * 4	→	* 2 4	→	8 2 4
7 6 5		7 6 5		7 6 5		7 6 5		7 6 5		7 6 5		7 6 5		7 6 5		7 6 5		7 6 5		7 6 5

1 * 3		1 2 3
8 2 4	→	8 * 4
7 6 5		7 6 5

Q5

h(B) = 1   h(A) = 5

Therefore, node B will be expanded first since f(n) = 5 < f(n) = 7

h(A) = 5 is admissible since <= actual shortest path 5
h(B) = 1 is admissible since <= actual shortest path 4