Quiz 6

CSCE 580

March 28, 2017

Consider the state-space search problem in the figure below, where heuristic estimates are shown in parenthesis for each node, the start node is *a*, and the goal node is *g*.



Recall that a heuristic h(.) is admissible if h(*n*) does not overestimate the actual cost of the shortest path from *n* to the goal node, for every node *n*. Is h admissible?

**Answer**: yes.

A heuristic is monotone if abs(h(n’) – h(n)) <= c(n’,n) for any two adjacent nodes. (Your book has a different, but equivalent, definition.) Is h in the figure above monotone?

**Answer**: yes.

Run A\* by hand by filling out the table below. The values in parenthesis are: g, f (=g+h), and parent:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Step | Selection | OPEN | CLOSED |  |
| 1 | {} | {*a*(0,11,nil)} | {} |  |
| 2 | *a* | {(*c*(6,14,*a*),*b*(2,15,*a*),d(10,15,*a*)} | {*a*} |  |
| 3 |  |  |  | Update *d* (includes changing its parent to *c*) |
| 4 |  |  |  |  |
| 5 |  |  |  |  |

**Answer**:



Additional material:



S. Edelkamp and S. Schroedl. *Heuristic Search: Theory and Applications*. Morgan-Kaufmann, 2012.