HW3.3

Friday, March 3, 2023 3:34 AM

A = Initial

E = Goal

consistent = Estimate is always ≤ estimated distance from any neighboring vertex to the goal + the cost of reaching neighbor

$h^*(N)$ = optimal path from N to goal

admissible =

$0 \le h(N) \le h^*(N)$

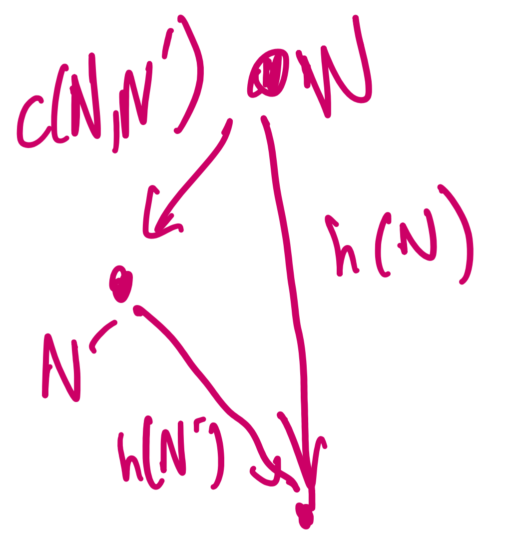
consistent

N' = child of N

1) $h(N) \le c(N, N') + h(N')$

2) Goal

$h(G) = 0$



a)

$A = h(N) = 105 \le (1 + 100) + (2 + 1)$ ✗ → inconsistent

$B = h(N) = 100 \le 1 + 90$ ✗ → inconsistent

$C = h(N) = 1 \le 2 + 90$ ✓ → consistent

$D = h(N) = 90 \le 100 + 0$ ✓ → consistent

b) $A^* : f(N) = g(N) + h(N)$

$g(N)$ = init to N

$h(N)$ = cost from N to goal node

$A, f = g(n) + h(n) = 0 + 105 = 105$

$B, f = (0+1) + 100 = 101$ ↓ $D, f = (1+1) + 90 = 92$ ↓ $E, f = (2+100) + 0 = 102$

$C = (0+2) + 1 = 3$ ↓ $D, f = (2+2) + 90 = 94$ ↓ $E, f = (4+100) + 0 = 104$

d)

$A = h(N) = 105 \le (1 + 101) + (2 + 101)$ ✓ → consistent

$B = h(N) = 101 \le 1 + 100$ ✓ → consistent

$C = h(N) = 101 \le 2 + 100$ ✓ → consistent

$D = h(N) = 100 \le 100 + 0$ ✓ → consistent

$A, f = 0 + 105 = 105$

$B, f = (0+1) + 101 = 102$ ↓ $D, f = (1+1) + 100 = 102$ ↓ $E, f = (2+100) + 0 = 102$

$C, f = (0+2) + 101 = 103$ ↓ $D, f (2+2) + 100 = 104$ ↓ $E, f (4+100) + 0 = 104$