Assignment 2: 10/10/2012

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Question 1:

(A) Farmer, fox, goose and bag of beans on the beginning side of the river.

(P) Farmer, fox, goose and bag of beans on the end side of the river

(C) Fox cannot be alone with goose
Goose cannot be alone with bag of beans

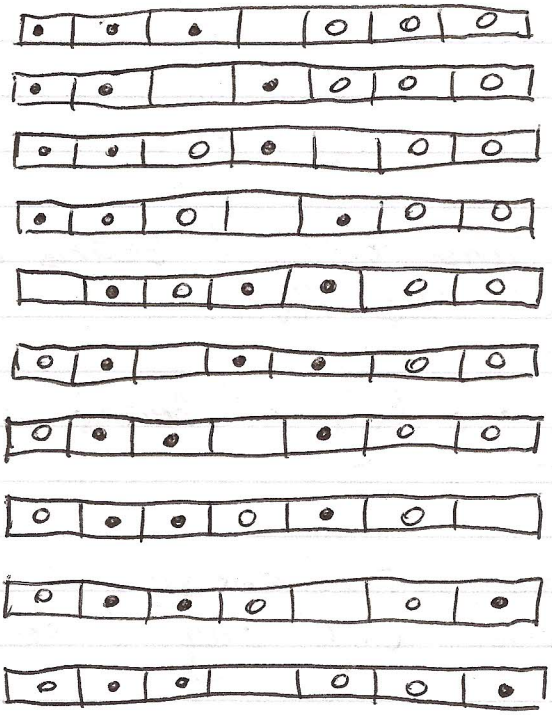
(D) Cross river with bag of beans
Cross river with fox
Cross river with goose

(E) See attached graph

(F) The Farmer takes the goose to the end side of the river. Then he goes back and takes the fox and crosses to the end side of the river.
He then takes the goose and crosses back to the beginning side.
He then takes the bag of beans and crosses back to the end side of the river.
He finally goes back and takes the goose and crosses back to the end side.

Question 2:

(A)



Repeat same steps till you reach :

So this looping.

(B) 0 pt if all white tiles are to the left of all black tiles.

h(bbbewww) ⟶ h(n) = 6 ⟶ initial state: all white tiles are to the right of all black tiles.

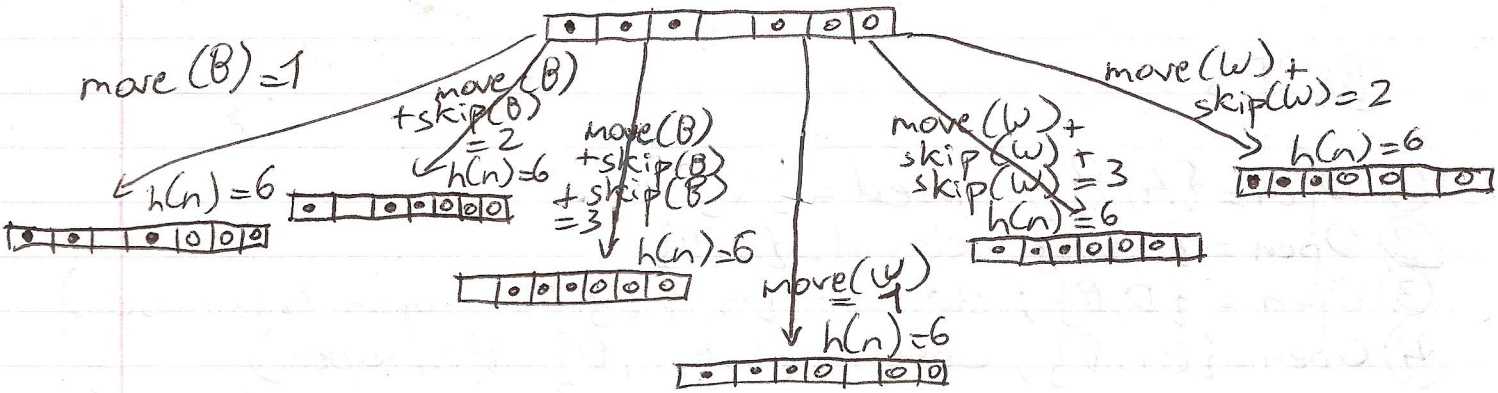
h(bebwwbw) ⟶ h(n) = 4 ⟶ need to move the white tiles until all of them are to the left of all black tiles. So two white and two blacks need to switch.

h(bebwbww) → h(n) = 4 → have to move all the white tiles until all of them are to the left of the black tiles. So need to move two white tiles to the left and two black tiles to the right

h(ewwwbbb) → h(n) = 0 → goal state: all white tiles are to the left of all the black tiles

h(wwwebbb) → h(n) = 0 → goal state: all white tiles are to the left of all the black tiles.

(c) Operators: move(tile)
skip(tile)



Question 3:

(A) BFS

① Open = {A, B} ; closed = {S}
② Open = {D, C, B} ; closed = {S, A}
③ Open = {C, D, E, G_2} ; closed = {S, A, B}
④ Open = {D, E, G_2} ; closed = {S, A, B, C} (D in open, S in closed)
⑤ Open = {E, G_2, G_1} ; closed = {S, A, B, C, D} (B in closed)
⑥ Open = {G_2, G_1} ; closed = {S, A, B, C, D, E} (G_1 in open)

A + G_2

Open = {G_1} ; closed = {S, A, B, C, D, E, G_2}

(B) DFS

① Open = {A, B} ; closed = {S}
② Open = {C, D, B} ; closed = {S, A}
③ Open = {D, B} ; closed = {S, A, C} (D in open, S in closed)
④ Open = {G_1, D} ; closed = {S, A, C, D} (B in open)

A + G_1

(C) Using steepest ascent hill climbing

① Open = {A}; closed = {S}
② Open = {D}; closed = {S, A}
③ Open = {G1}; closed = {S, A, D}

At G_1

(D) Best-First Search

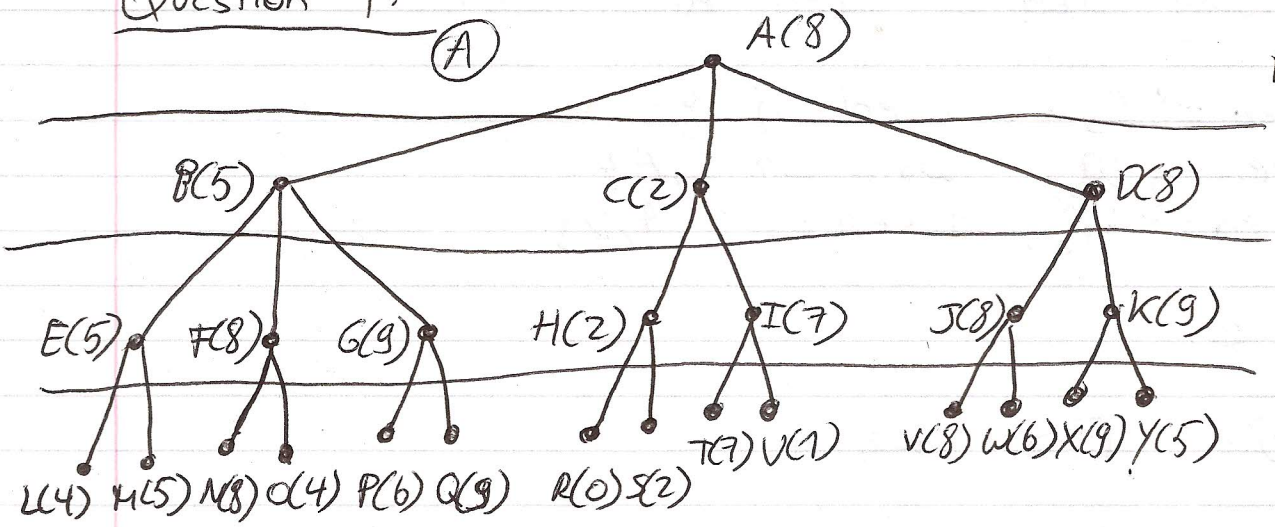
① Open = {A}; closed = {S}
② Open = {D}; closed = {S, A}
③ Open = {G1}; closed = {S, A, D}

At G_1

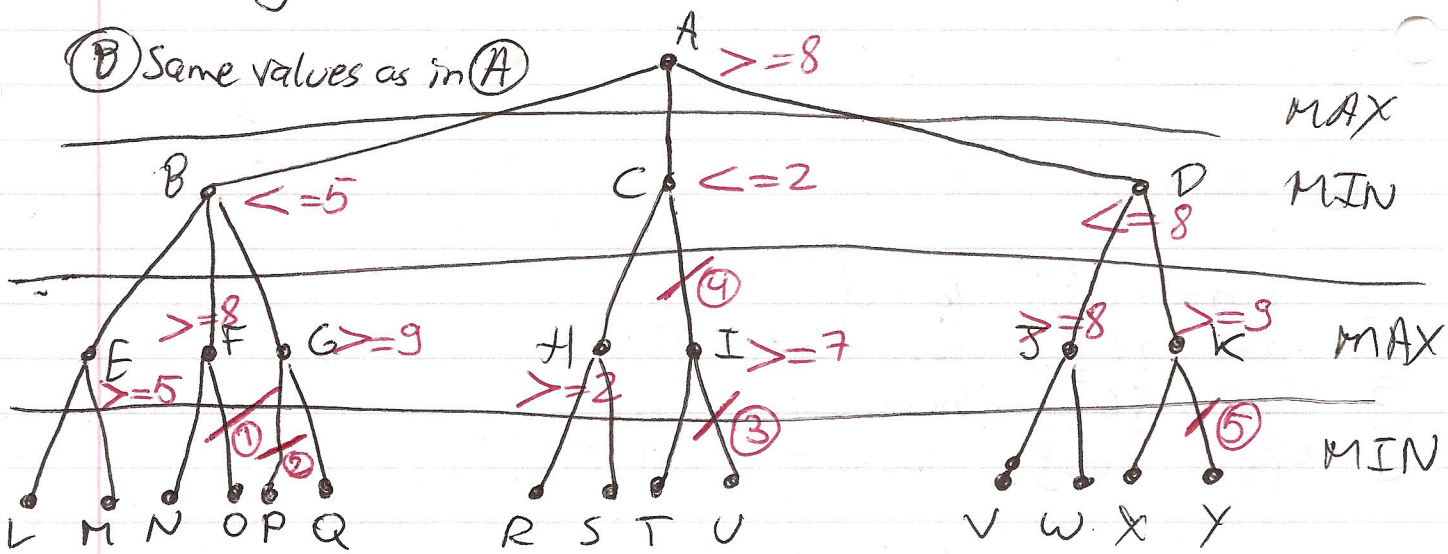
(E) Algorithm A

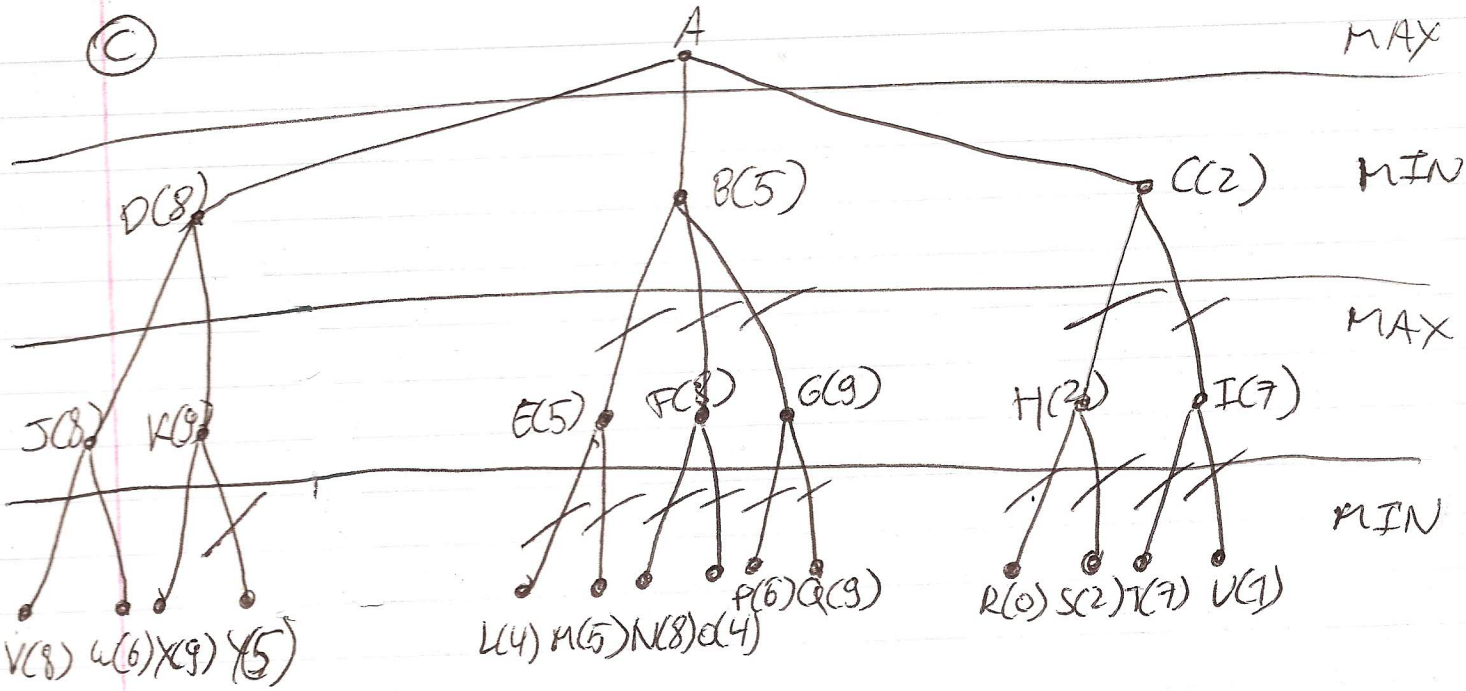
① Open = {A}; closed = {S}
② Open = {C}; closed = {S, A}
③ Open = {D}; closed = {S, A, C}
④ Open = {G1}; closed = {S, A, C, D}

Question 4.



MAX should go to D since it is the child with the highest value.

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A
MAX
D(8)
B(5)
C(2)
MIN
MAX
J(8)
K(9)
E(5)
F(8)
G(9)
H(2)
I(7)
MIN
V(8) W(6) X(9) Y(5)
L(4) M(5) N(8) O(4)
P(6) Q(9)
R(0) S(2) T(7) U(1)