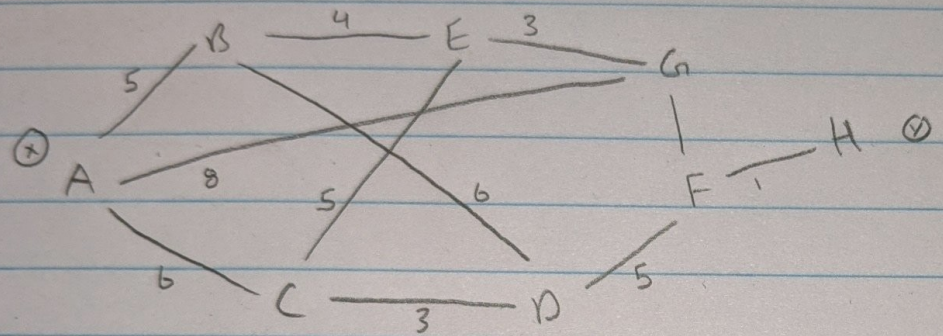
Assignment #1

$\langle \Sigma, succ, s_0, G \rangle$



30/30 a) Each state is a pair of cities indicating the location of x and the location of y (e.g., (A, H). Something like:

$A = \{A, B, C, D, E, F, G, H\}$

$B = A \times A$

$\Sigma = \{A, B \mid A \in B\}$???

↑ x location ↑ y location

Σ = set of states = $\{(A,A), (B,B), (C,C), (D,D), (E,E), (F,F), (G,G), (H,H),$
$(A,B), (B,A), (C,A), (D,A), (E,A), (F,A), (G,A), (H,A),$
$(A,C), (B,C), (C,B), (D,B), (E,B), (F,B), (G,B), (H,B),$
$(A,D), (B,D), (C,D), (D,C), (E,C), (F,C), (G,C), (H,C),$
$(A,E), (B,E), (C,E), (D,E), (E,D), (F,D), (G,D), (H,D),$
$(A,F), (B,F), (C,F), (D,F), (E,F), (F,E), (G,E), (H,E),$
$(A,G), (B,G), (C,G), (D,G), (E,G), (F,G), (G,F), (H,F),$
$(A,H), (B,H), (C,H), (D,H), (E,H), (F,H), (G,H), (H,G)$
$\}$ that's long...

Yes, it is long if you list every element. See my solution.

b) The tra...

(A,C), (B,C), (C,B), (D,B), (E,B), (F,B), (G,B), (H,B),
(A,D), (B,D), (C,D), (D,C), (E,C), (F,C), (G,C), (H,C),
(A,E), (B,E), (C,E), (D,E), (E,D), (F,D), (G,D), (H,D),
(A,F), (B,F), (C,F), (D,F), (E,F), (F,E), (G,E), (H,E),
(A,G), (B,G), (C,G), (D,G), (E,G), (F,G), (G,F), (H,F),
(A,H), (B,H), (C,H), (D,H), (E,H), (F,H), (G,H), (H,G)
}

that's long...

needs a more-precise formulation for succ

20/40 b) The transition between states are when x and y move to a new location, (succ). Such as (A,H) -> (C,F) -> (D,D).

I think the way to represent this is: $\{succ \in \Sigma \mid (x,y) \in succ\} \leq \}$??

10/10 d) $G = \{(A,A), (B,B), (C,C), (D,D), (E,E), (F,F), (G,G), (H,H)\}$

10/10 c) $s_0 = \{(A,H)\}$

10/10 e) N = # of nodes which is 8 so $N^2 = 64$, there are 64 states. In other words, there are 64 different combinations to the locations x and y can have with 8 of them being the same.