Mark Abraham

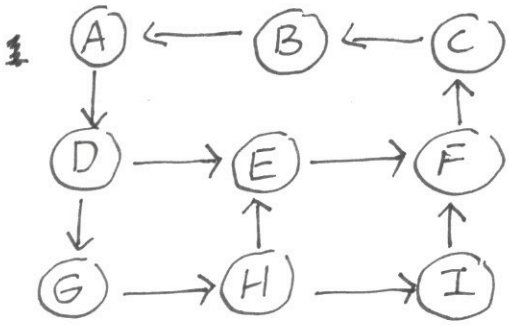
Assignment 3d

3.15

(a) intersection ↔ intersectron

previous problems showed that if all the nodes (intersections) of a graph (city) constitute a strongly connected component, then ~~the~~ by the definition of a scc you would be able to get from any intersection to any other intersection in linear time.

Algrorithm



|V| 1. Reverse G

E 2. ~~List P~~

|E| 2. Run DFS on G^R

|V| 3. List in Post # order

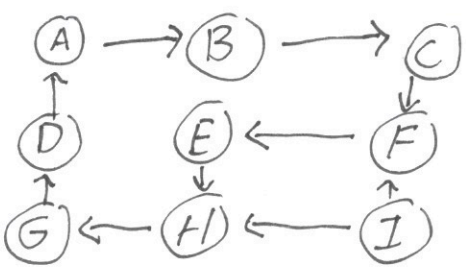
|V| 4. Run DFS on G using post

Linear

(b) In this case, Rather than having entire graph be an scc, you would just have one section be a scc and use the same algorithm

~~SC~~ Algorithm

same as above but the cc ~~# of the town~~ should include a town hall



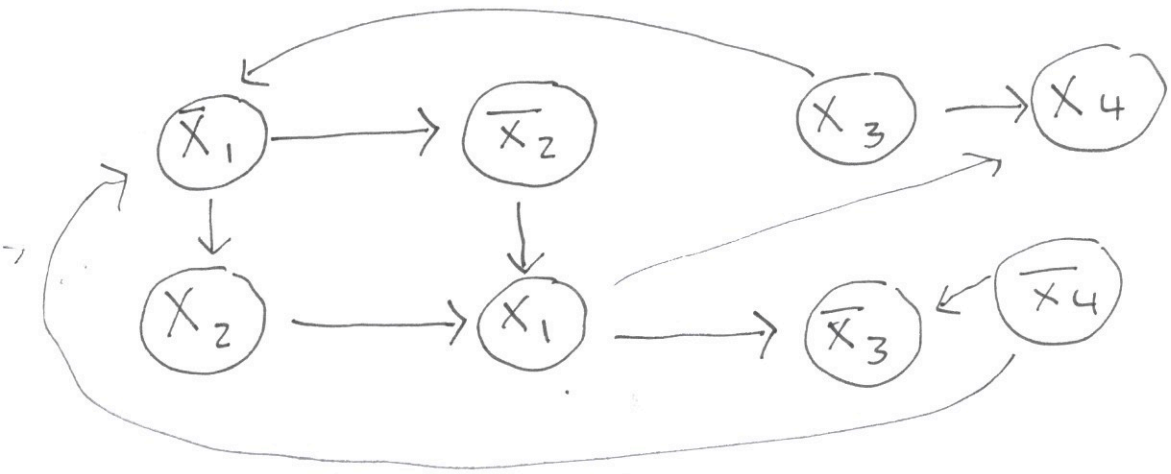
{A, B, C, F, E, H, G D} A = Town Hall

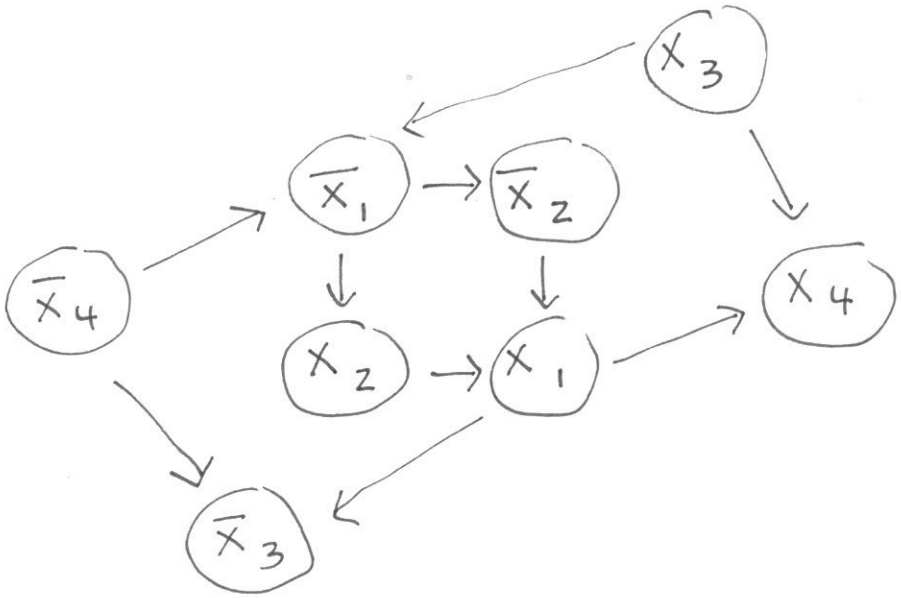
{I}

3.28

(e)

$$(x_1 \vee \bar{x}_2) \wedge (\bar{x}_1 \vee \bar{x}_3) \wedge (x_1 \vee x_2) \wedge (\bar{x}_3 \vee x_4) \wedge (\bar{x}_1 \vee x_4)$$





(f)

By Eliminating the negatron of a literall in the graph of I where no scc exist in a scc together we halt the time. Since 2 sat can be graphed as a uni-directional graph and graph can be solved in linear time 2 sat is linear.