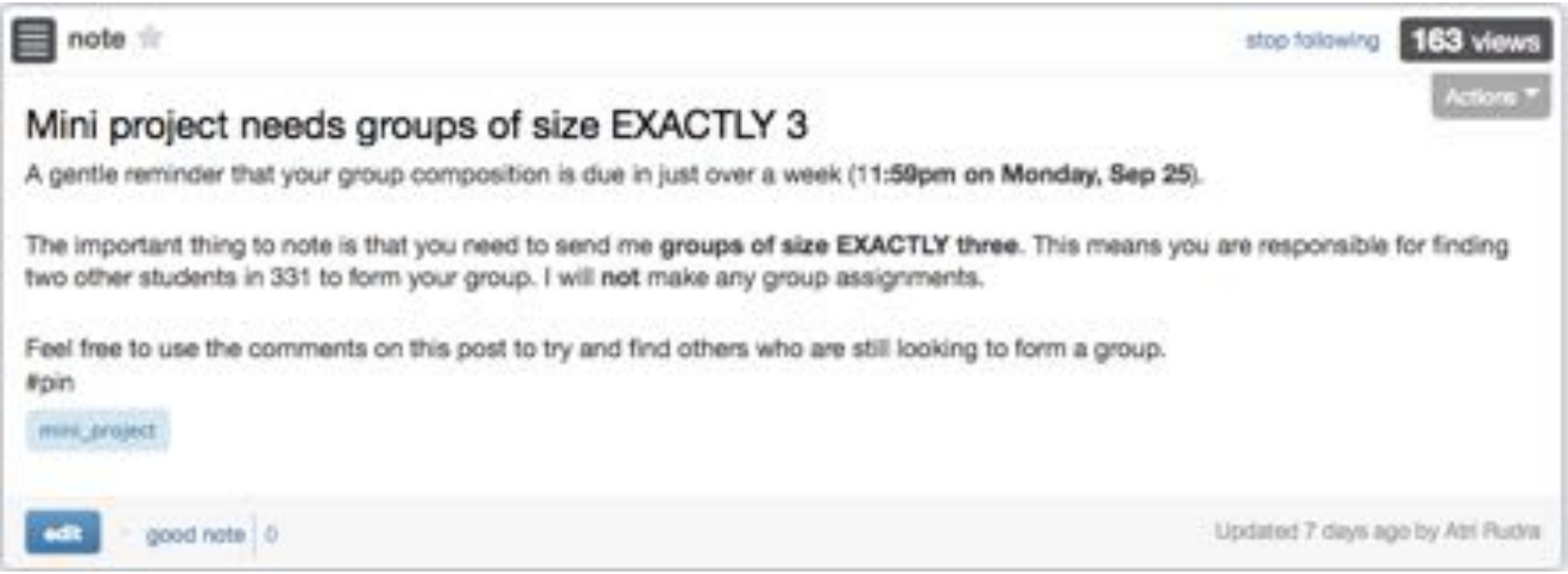
Lecture 12

CSE 331

Sep 25, 2017

Mini Project group due TODAY!



Register for CSE 50!

https://engineering.buffalo.edu/computer-science-engineering/news-events/cse50.html

Use the “Current Student & Faculty Registration” option

We will have class on Friday and HW 3 is still due 11am on Friday

Connectivity Problem

Input: Graph G = (V,E) and s in V

Output: All t connected to s in G

Breadth First Search (BFS)

Build layers of vertices connected to s

$L_0 = \{s\}$

Assume $L_0,..,L_j$ have been constructed

L_{j+1} set of vertices not chosen yet but are connected to L_j

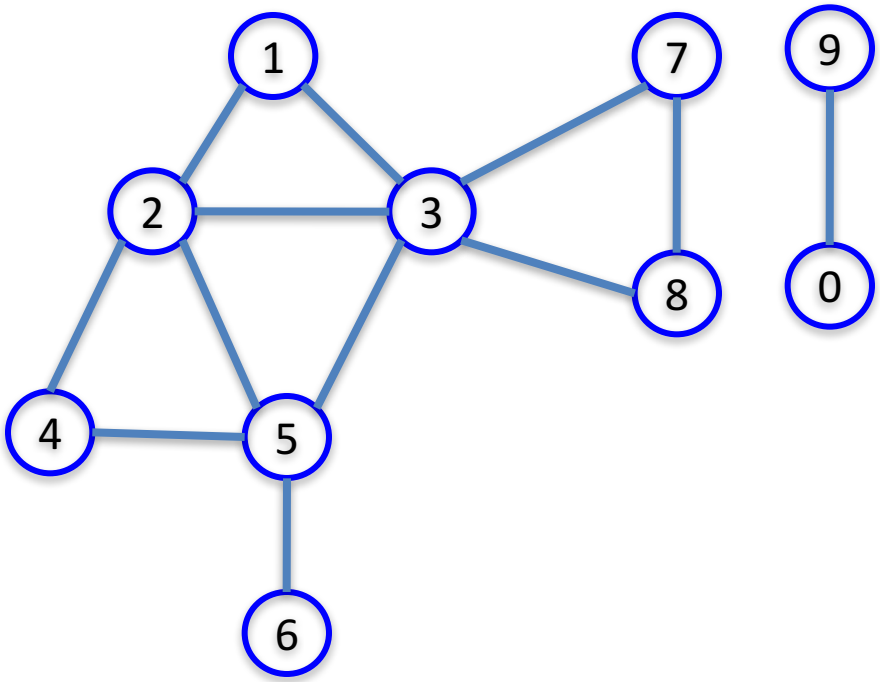
Stop when new layer is empty

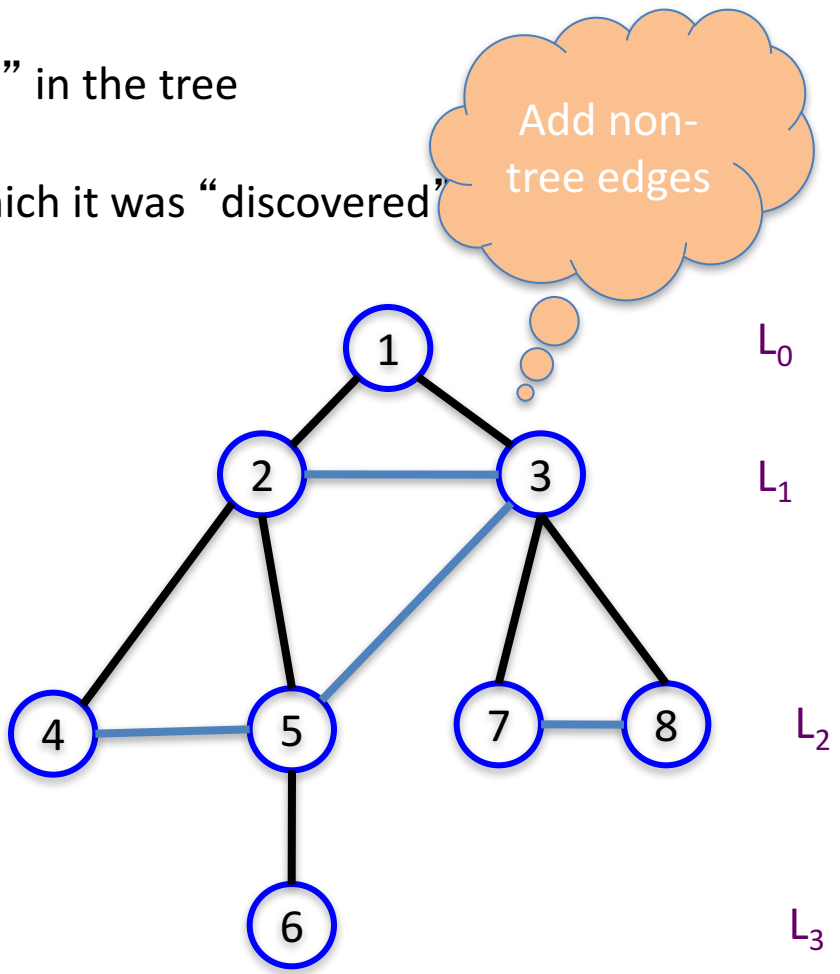
BFS Tree

BFS naturally defines a tree rooted at s

L_j forms the jth "level" in the tree

u in L_{j+1} is child of v in L_j from which it was "discovered"



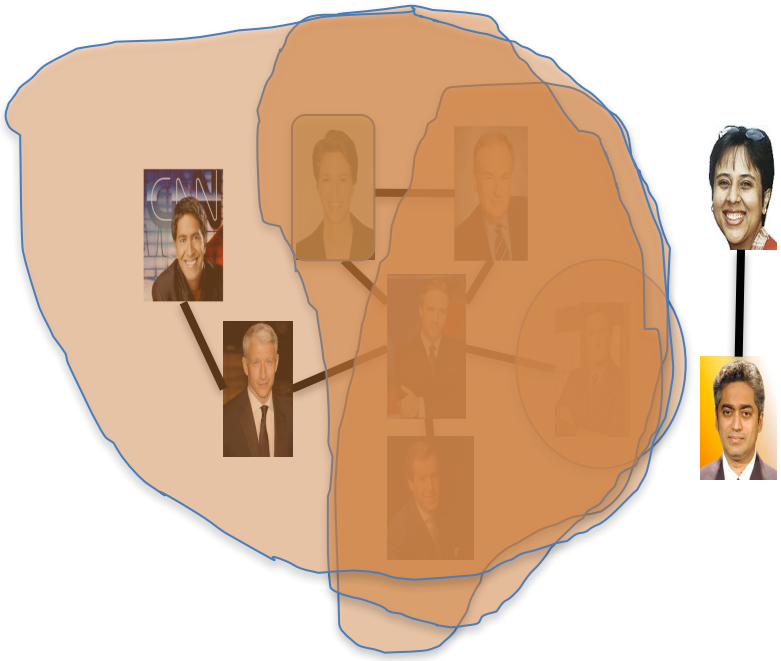


Today’s agenda

Every edge in is between consecutive layers

Computing Connected component

Computing Connected Component



Explore(s)

Start with R = {s}

While exists (u,v) edge v not in R and u in R

Add v to R

Output $R^* = R$

Questions?

BFS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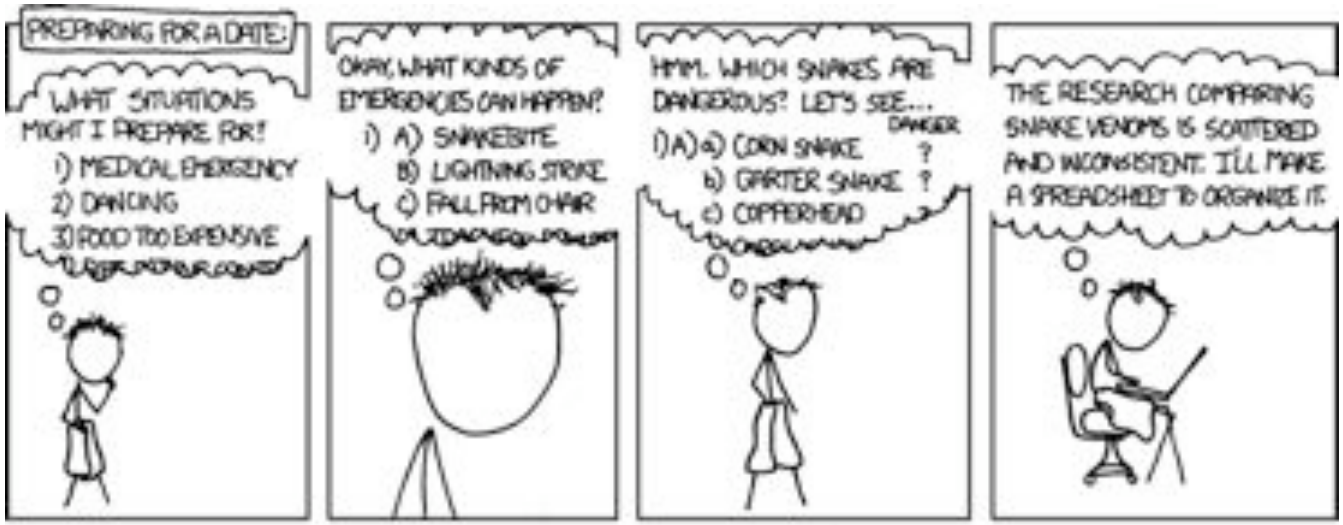
Depth First Search (DFS)



http://xkcd.com/761/

DFS(u)

Mark u as explored and add u to R

For each edge (u,v)

If v is not explored then DFS(v)