

Lecture 10

CSE 331

Sep 21, 2016

Mini Project choice due Sep 26

note ☆

0 views

Actions ▾

Mini project needs groups of size EXACTLY 3

A gentle reminder that your group composition is due in just over a week (11:59pm on Monday, Sep 26).

The important thing to note is that you need to send me **groups of size EXACTLY three**. This means you are responsible for finding two other students in 331 to form your group. I will **not** make any group assignments.

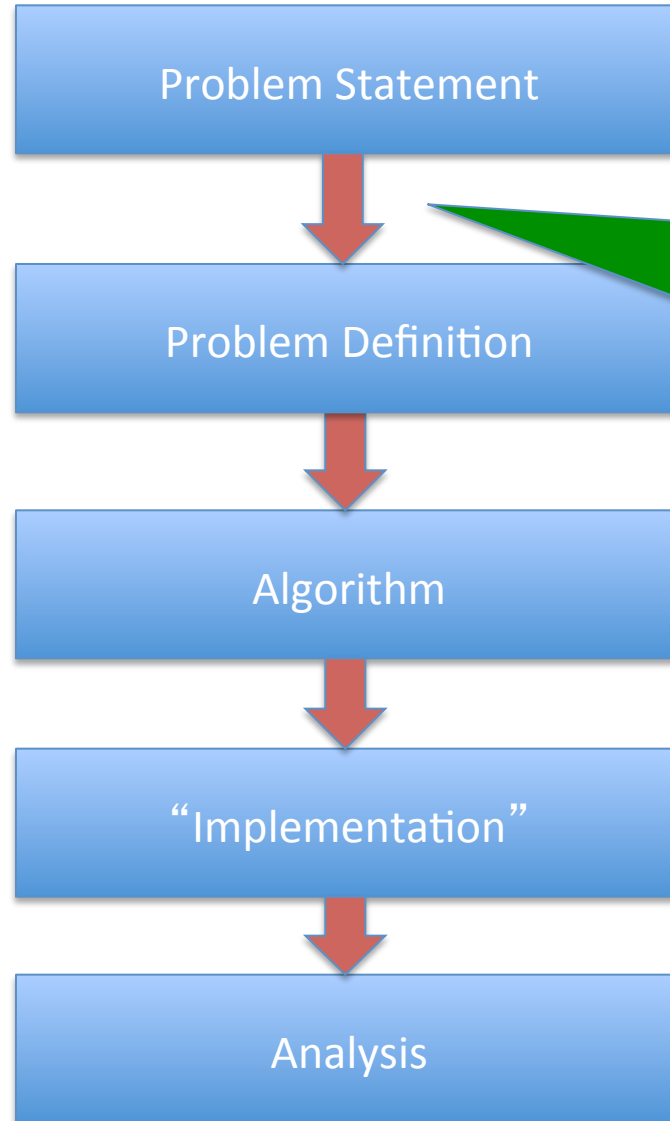
Feel free to use the comments on this post to try and find others who are still looking to form a group.

mini_project

good note | 0

Updated Just now by Airt Fluids

Up Next....



A generic tool
to abstract
out problems

Graphs

Representation of relation

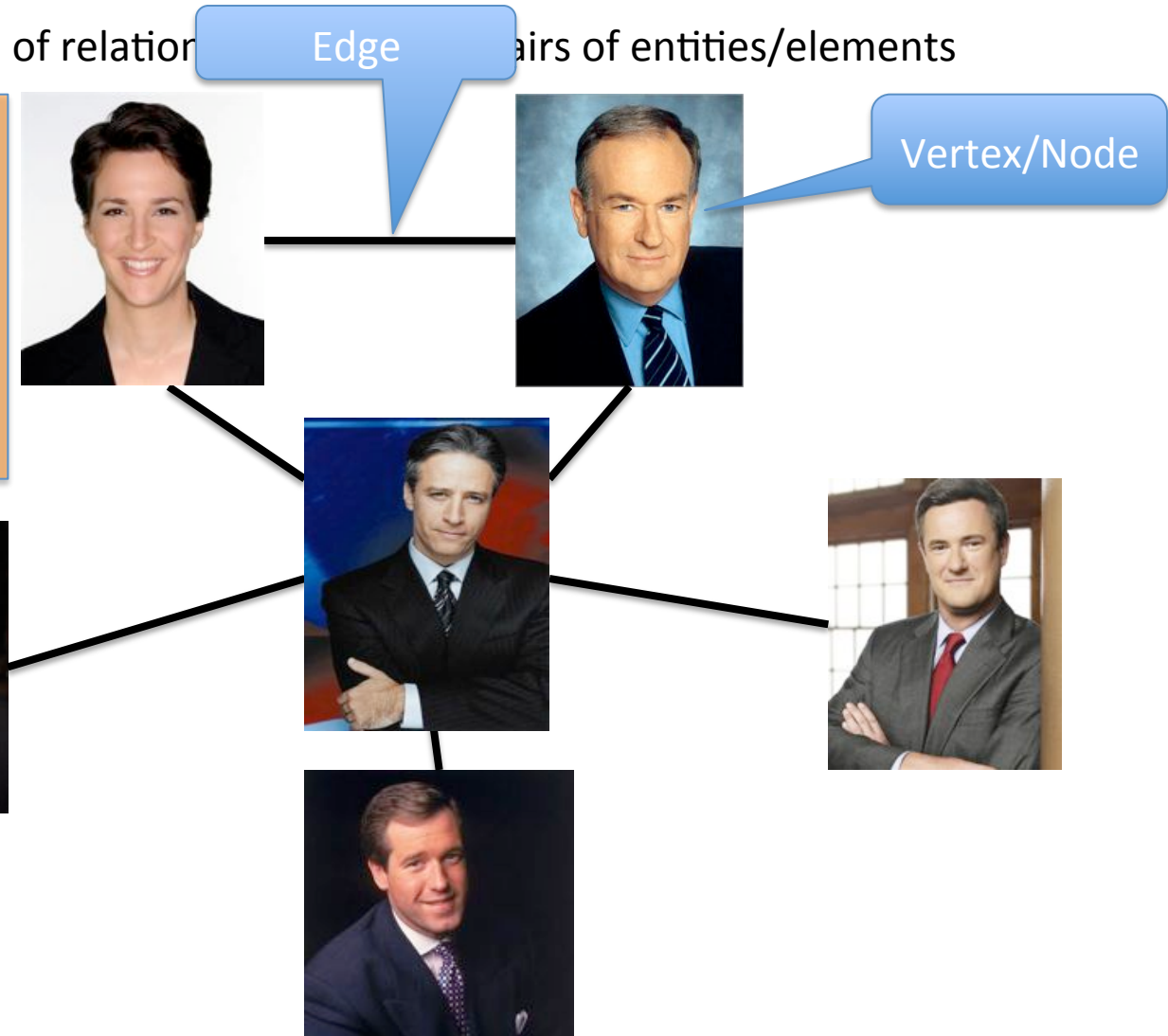
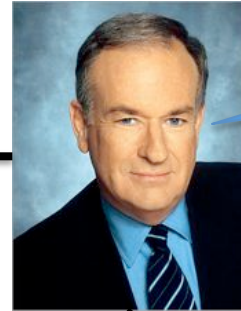
Edge

Pairs of entities/elements

Entities: News hosts

Relationship: Mention
in other's program

Vertex/Node



Graphs are omnipresent

Airline Route maps



Español • Help • Speak up

Book travel

Manage your flights

Travel deals

Where we jet

TrueBlue® program

Buffalo, NY [BUF]

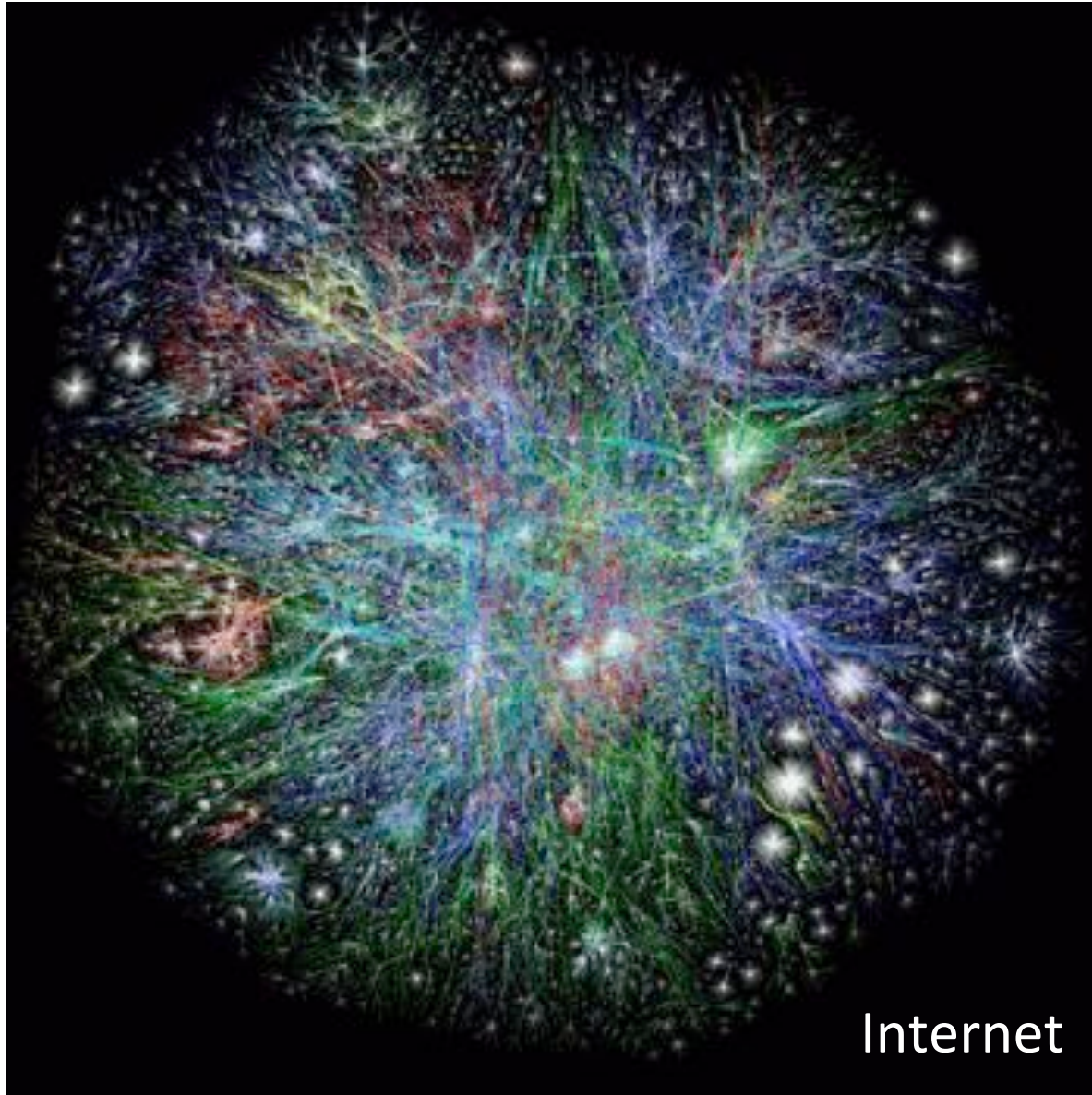
All Destinations

Nonstop Flights Only

Clear Map

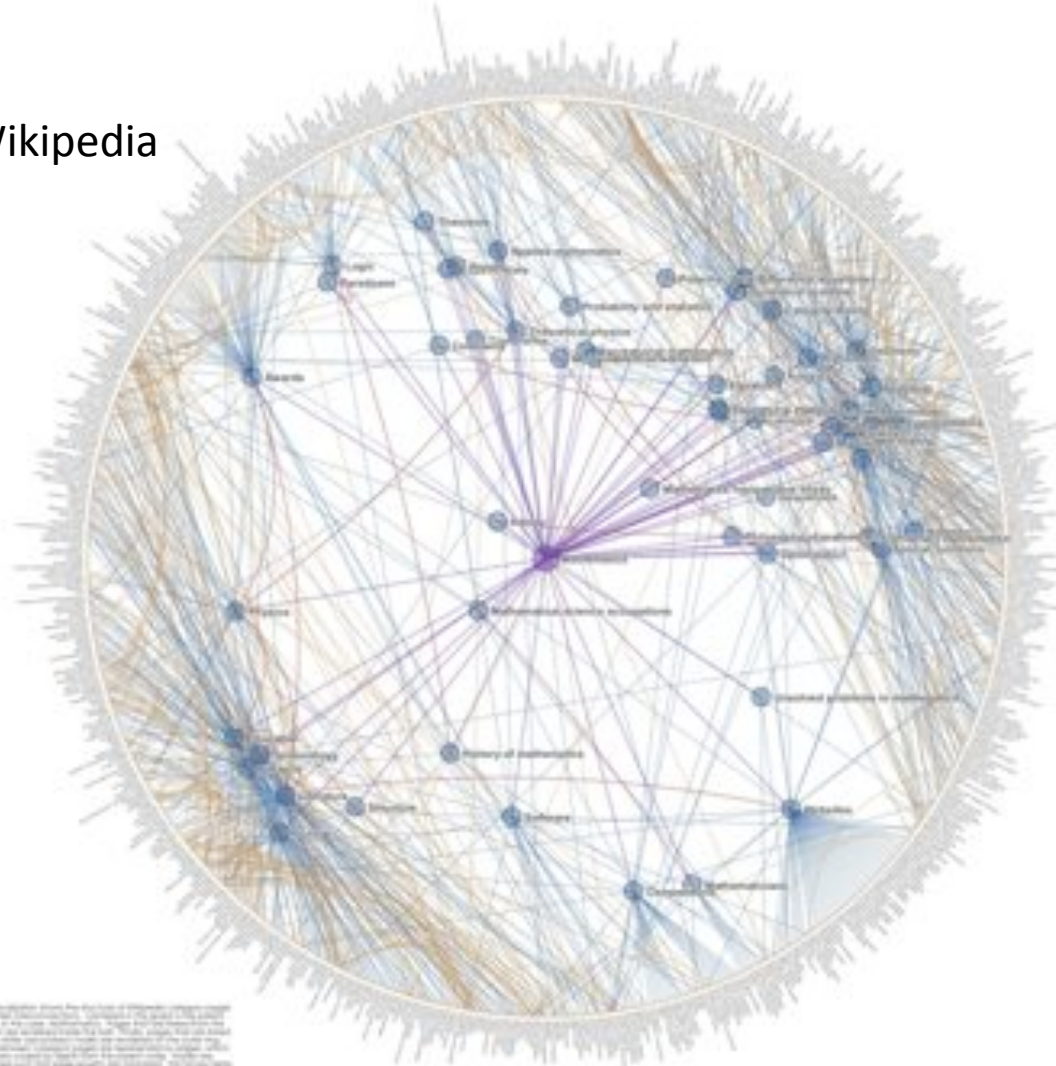


What does this graph represent?



And this one?

Math articles on Wikipedia



Chris Harrison is a mathematician and a member of the Wikimedia Foundation. He is the author of the book "The Mathematics of the Internet" and the creator of the "Mathematics of the Internet" project. He is also a member of the Wikimedia Foundation's Board of Directors. He is currently a senior advisor at the Wikimedia Foundation. He is also a member of the Wikimedia Foundation's Board of Directors. He is currently a senior advisor at the Wikimedia Foundation. He is also a member of the Wikimedia Foundation's Board of Directors.

ChrisHarrison.net

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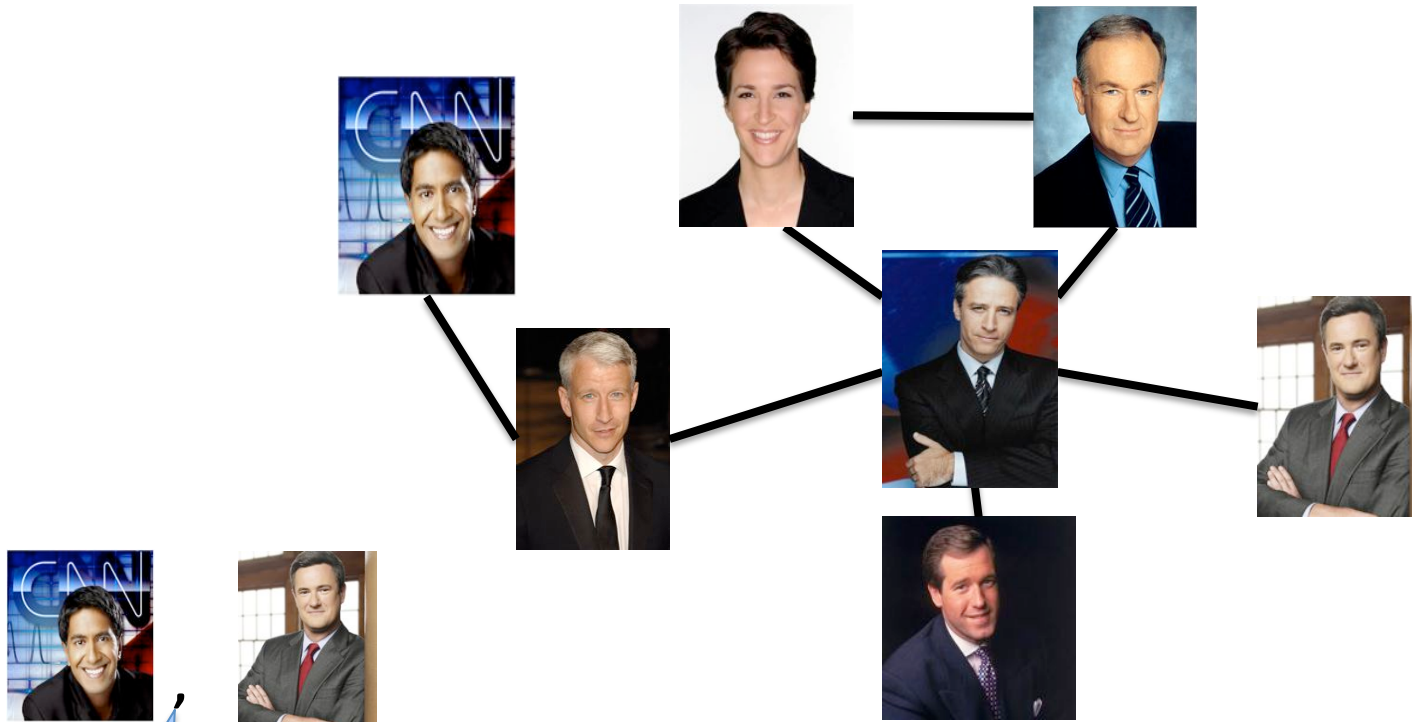
And this one?



Rest of today's agenda

Basic Graph definitions

Paths



Sequence of vertices connected by edges

Connected



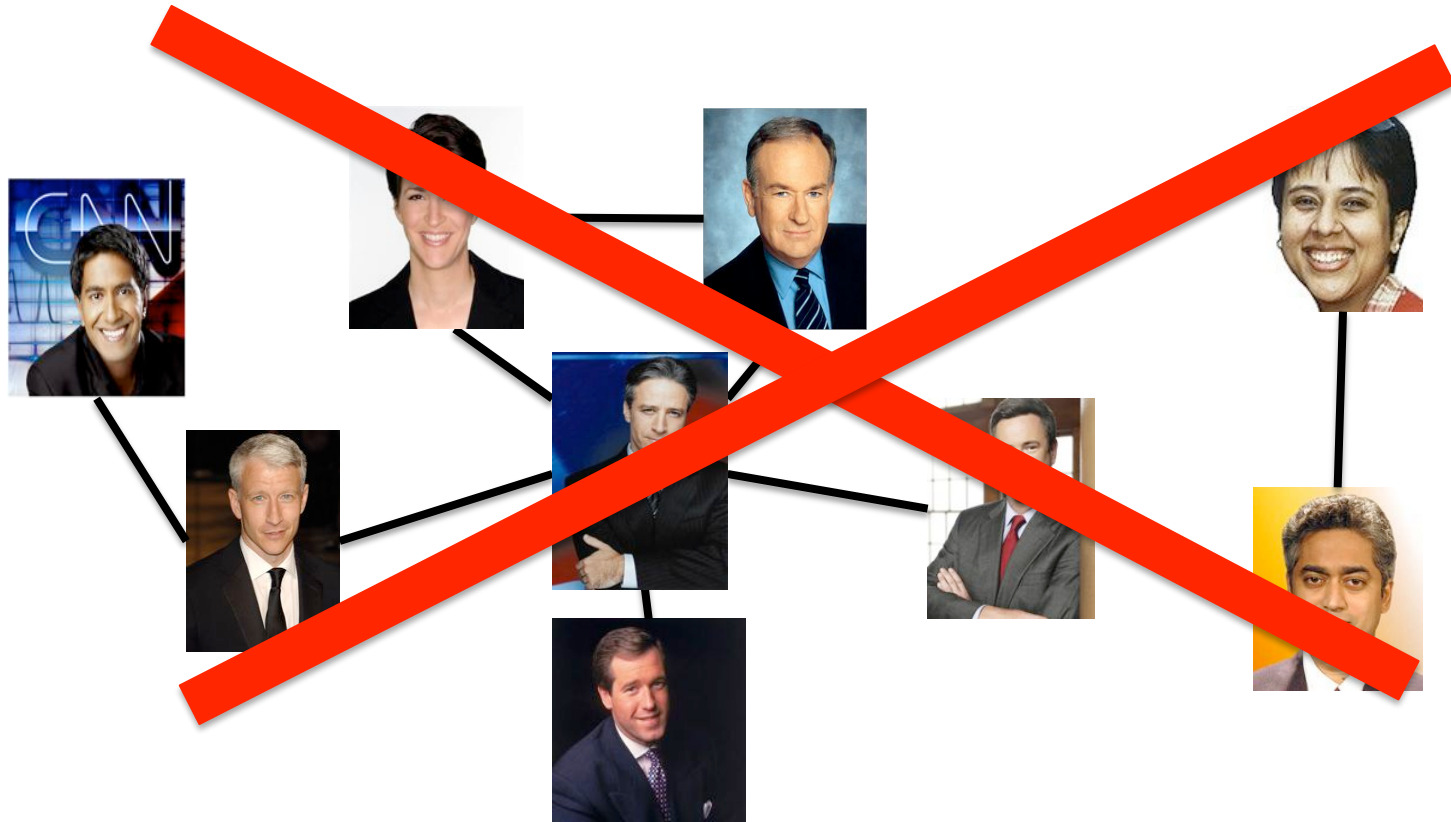
Path length 3

Connectivity

u and w are connected iff there is a path between them

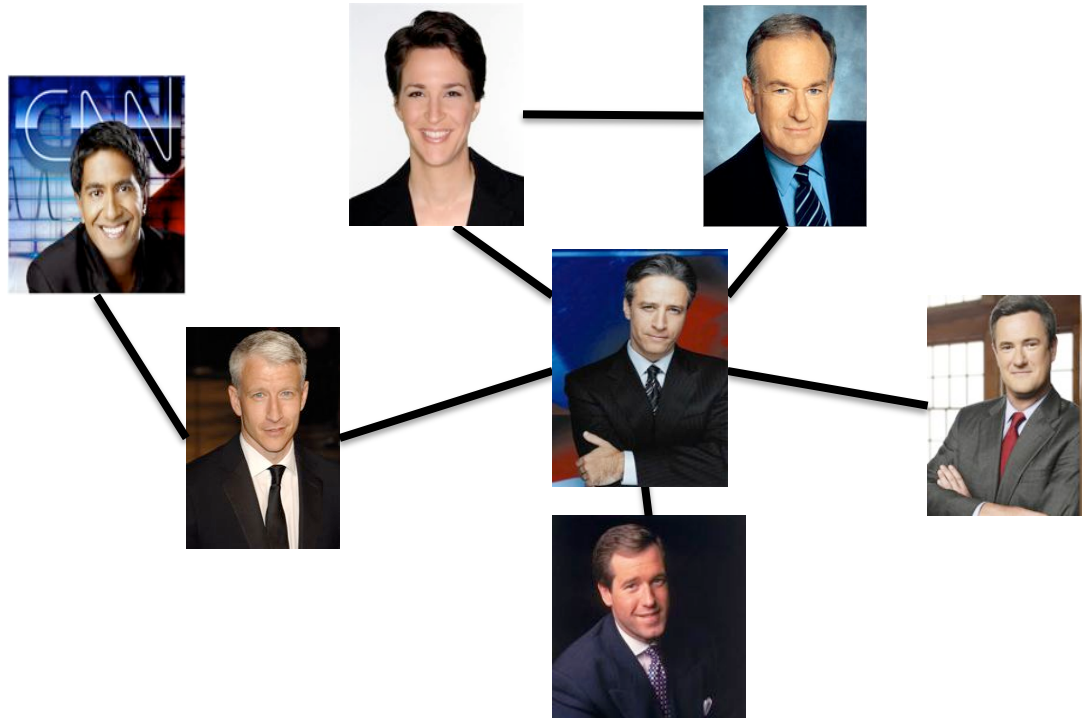
A graph is connected iff all pairs of vertices are connected

Connected Graphs



Every pair of vertices has a path between them

Cycles

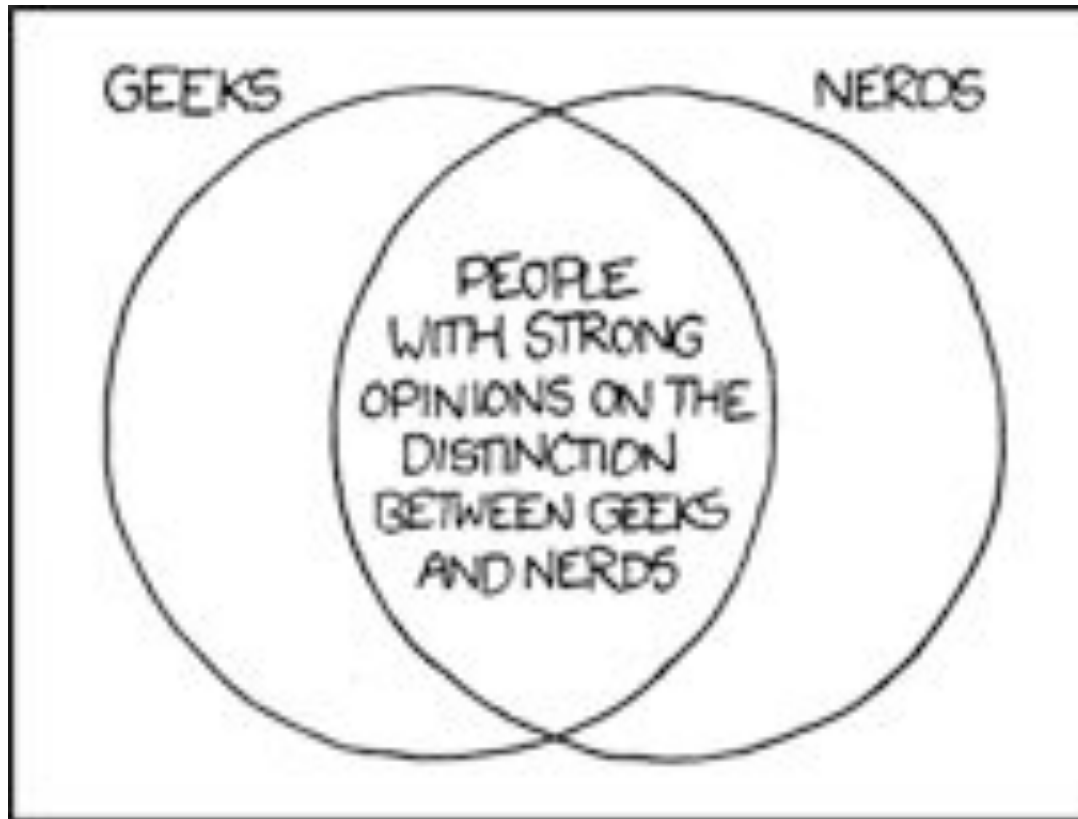


Sequence of k vertices connected by edges, first $k-1$ are distinct





Formally define everything



http://imgs.xkcd.com/comics/geeks_and_nerds.png

Rest of Today's agenda

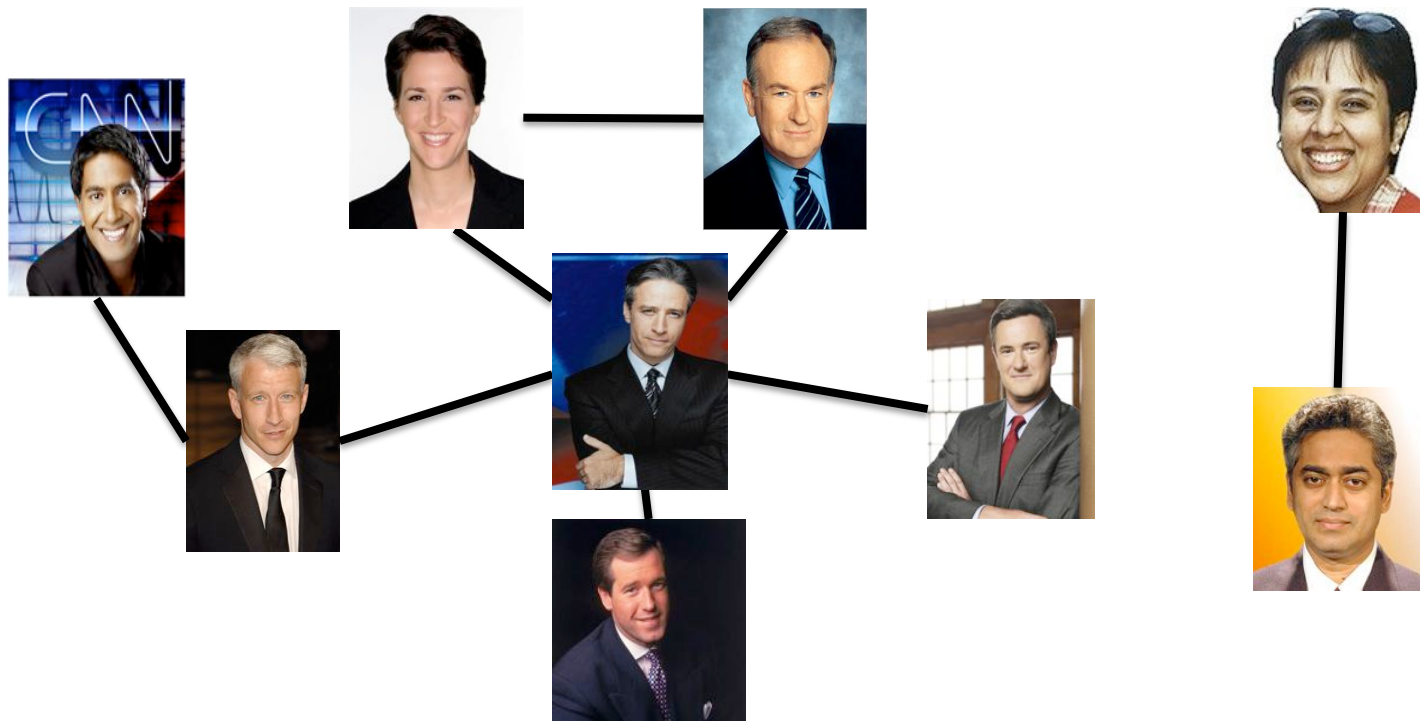
Formal definitions of graphs, paths, cycles, connectivity
and trees

Prove n vertex tree has $n-1$ edges

Algorithms for checking connectivity

Tree

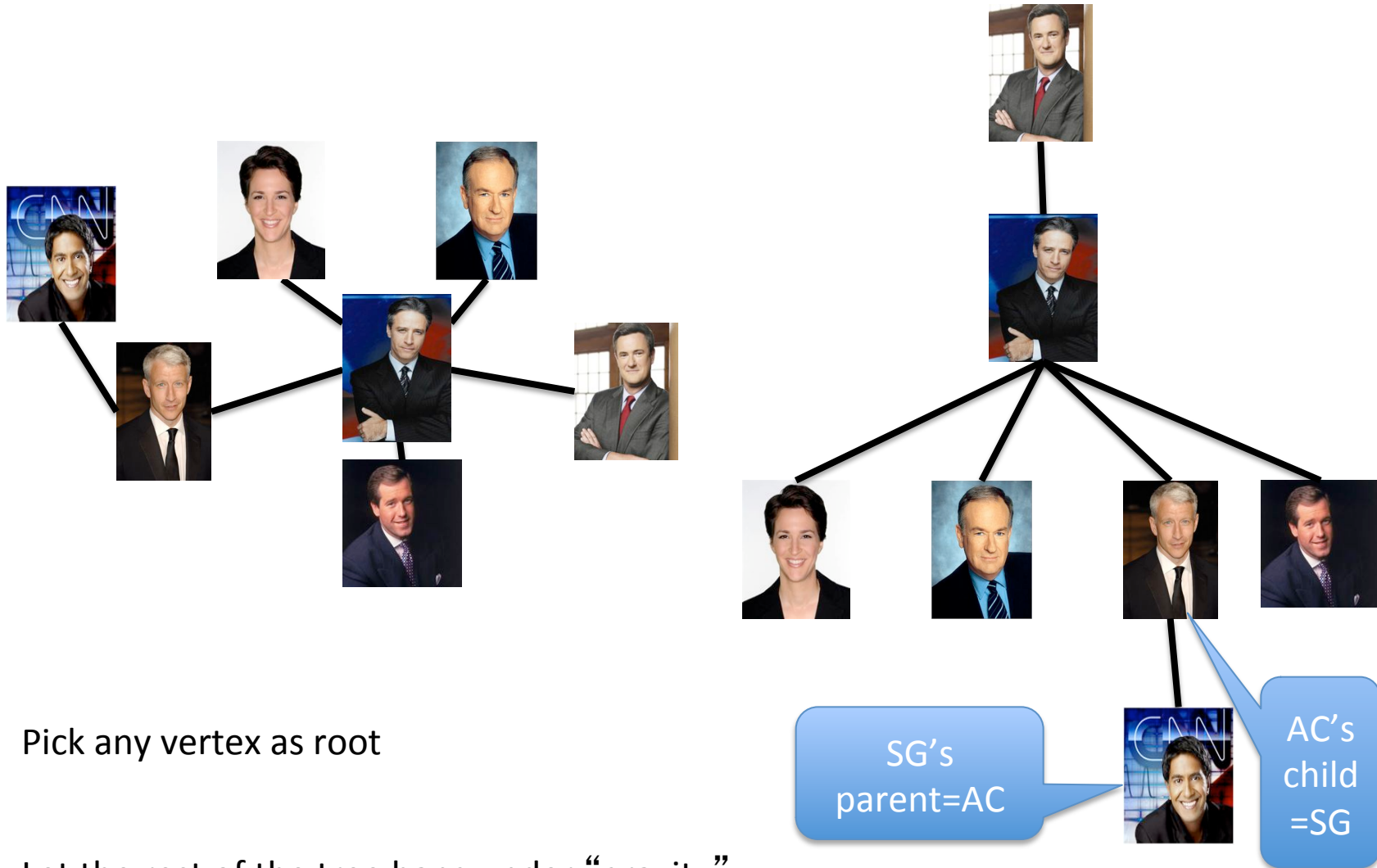
Connected undirected graph with no cycles



Rooted Tree



A rooted tree



Pick any vertex as root

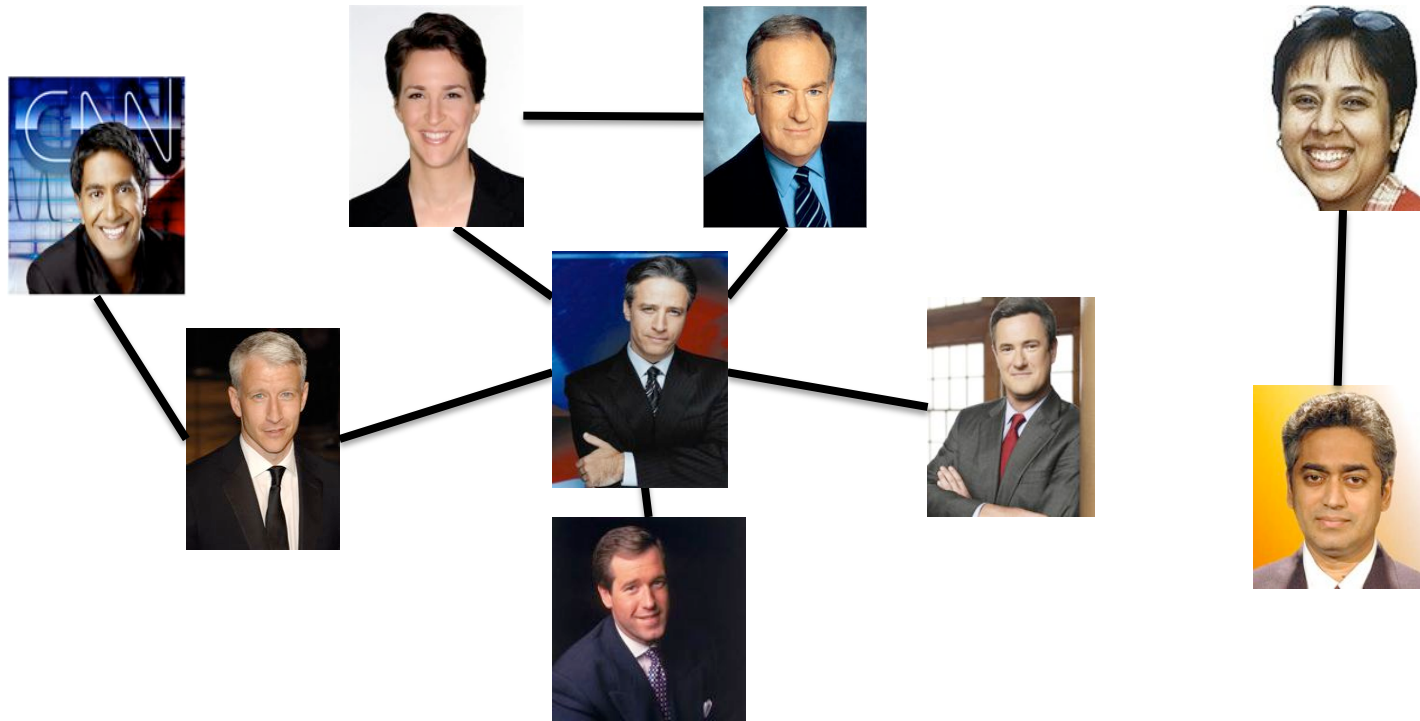
Let the rest of the tree hang under “gravity”

Rest of Today's agenda

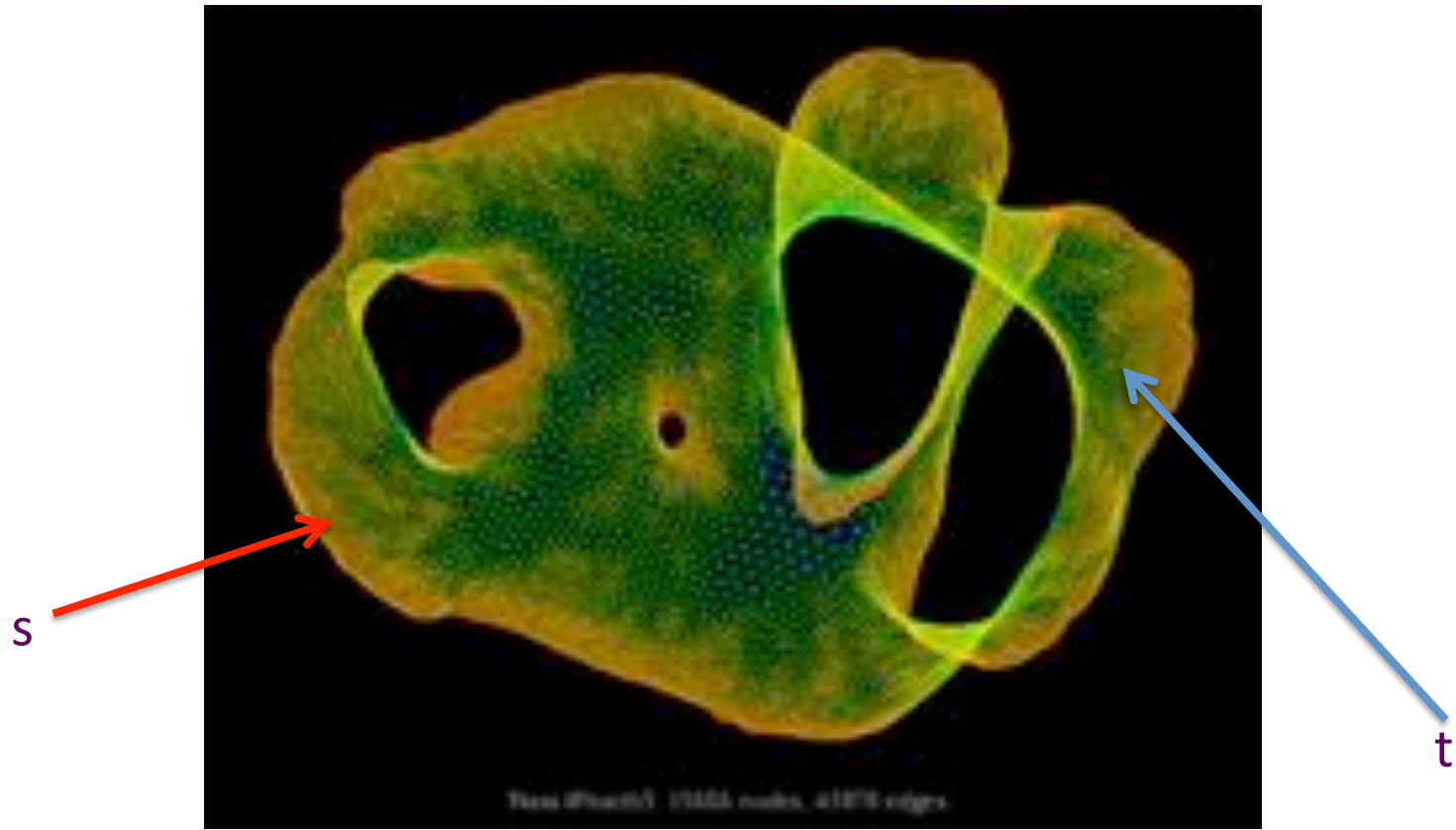
Prove n vertex tree has $n-1$ edges

Algorithms for checking connectivity

Checking by inspection



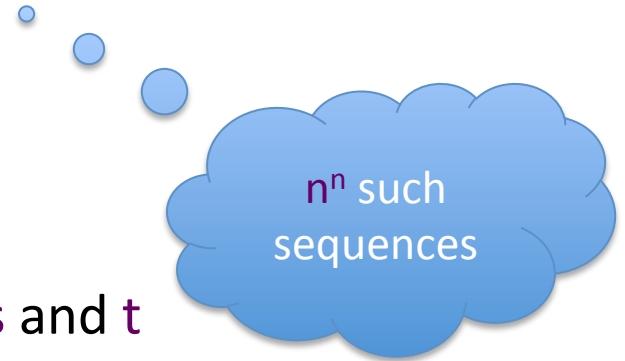
What about large graphs?



Are *s* and *t* connected?

Brute-force algorithm?

List all possible vertex sequences between s and t



Check if any is a path between s and t

Algorithm motivation

