

Lecture 10

CSE 331

Sep 20, 2023

Project groups due in <2 weeks

Deadline: Friday, Sep 29, 11:59pm

CSE 331

Syllabus

Piazza

Schedule

Homeworks ▾

Autolab

Project ▾

Support Pages ▾

channel

Sample Exams ▾

Forming groups

You form groups of size **exactly three (3)** for the project. Below are the various logis

Project Overview

Group signup form

- You have two choices in forming your group:

1. You can form your group on your own: i.e. you can submit the list of EXACTLY three (3) groups members in your group.

</> Note

Note that if you pick this option, your group needs to have **exactly THREE (3)** members. In particular, if your group has only two members you cannot submit as a group of size two. If you do not know many people in class, feel free to use piazza to look for the third group member.

Also, if you form a group of size three, please make only **one submission per group**.

2. You can submit *just your name*, and you will be assigned a random group *among all students who take this second option*. However, **note that if you pick this option you could end up in a group of size 2**. There will be at most two groups of size 2.

</> Potential risk

Note that if you pick the option of being assigned a random group, you take on the risk that a assigned group might not "pull their weight." We unfortunately cannot help with such aspects of group dynamics. (Of course if a group member is being abusive, please do let Atri know.) Please note that a group member who does not do much work will get penalized on the [individual component](#) of the project grade.

Submitting your group composition

Use [this Google form](#) to submit your group composition (the form will allow you to pick one of the two options above).

- You need to fill in the form for group composition by **11:59pm on Friday, September 30**.

</> Deadline is strict!

If you do not submit the form for group composition by the deadline, then you get a **zero for the entire project**.

Confirmation of form submission

note @132

stop following 80 views

Actions

Confirmation of project group signing

As I mentioned in class today, here's the deal for confirmation of your submission of the group formation form:

- If you **submit the form by this Friday**, I will send an email confirmation *over the weekend*
- If you submit after Friday (but obviously before the actual deadline), then I will send an email confirmation **after** the deadline is done.

project logistics

Edit good note | 1

Updated 20 hours ago by Atri Rudra

If you need it, ask for help



Piazza response policy

Piazza Response policy

Please note the following rules regarding response time to student questions on Piazza:

1. Any question posted between Friday 5pm and Monday 9am might not get an answer from CSE 331 staff before Monday 9am.
2. On weekdays, we will aim to respond to student question within four hours unless the question is posted between 7pm and 9am, in which case we might only be able to respond after 9am.

Please note that the above does *not* mean that we will never answer questions posted in the evening/night times as mentioned above-- it's just that we might not always be able to respond within four hours. Based on previous years, I do expect there to be reasonable response time in the evening times as well-- it's just that OUR response times might be more variable.

“One click” rule

note @158

stop following

1 view

Actions

One-click rule

A gentle reminder that the [one click rule](#) is in place for allowed source. I.e. you should not be clicking on links from webpages that are allowed sources.

I did not know this until now but the above includes not clicking on a non-English language version of a Wikipedia page since apparently different languages can have different content for the same page.

logistics

Edit good note | 0

Updated 30 seconds ago by Atri Rudra

If you did an AI violation on HW 1

You can still withdraw it with no penalty by 11:59pm tonight

Withdrawing a submission for academic integrity violation

Sometime mistakes can happen so you have the **option of withdrawing any of your Homework submission with 24 HOURS of the assignment deadline**. You can do this by sending Atri an email, e.g. by using the following template (thanks to [Oliver Kennedy](#) for providing us the template):

Email template for withdrawing submission

Dear Dr. Rudra/Atri,

I wish to inform you that I have violated CSE 331 policies on my submission for Question X on Homeworks/Assignment N. I wish to withdraw my submission to preserve academic integrity.

J.Q. Student
Person #12345678
UBIT: jqstuden

Sincerely, J

On receiving the above email, I will assign J a 0 on Question X on Homeworks/Assignment N but disregard any Academic Integrity issues with the problematic submission. Note that J is not required to present any details on how they violated academic integrity.

Homework 2 out!

Homework 2

Due by **11:30pm, Tuesday, September 26, 2023**.

Make sure you follow all the [homework policies](#).

All submissions should be done via [Autolab](#).

Sample Problem

The Problem

This problem is just to get you thinking about asymptotic analysis and input sizes.

An integer $n \geq 2$ is a prime, if the only divisors it has is 1 and n . Consider the following algorithm to check if the given number n is prime or not:

For every integer $2 \leq i \leq \sqrt{n}$, check if i divides n . If so declare n to be *not* a prime. If no such i exists, declare n to be a prime.

What is the function $f(n)$ such that the algorithm above has running time $\Theta(f(n))$? Is this a polynomial running time -- justify your answer. (A tangential question: Why is the algorithm correct?)

HW 1 solutions

Implementation Steps

(0) How to represent the input?

2D arrays: [WomanPref](#), [ManPref](#)

(1) How do we find a free woman w ?

Linked list: [free](#)

(2) How would w pick her best unproposed man m ?

Array: [next](#)

(3) How do we know who m is engaged to?

Array: [current](#)

(4) How do we decide if m prefers w' to w ?

$O(n)$ init
 $O(1)$ query/update

Overall running time

Init(1-4)



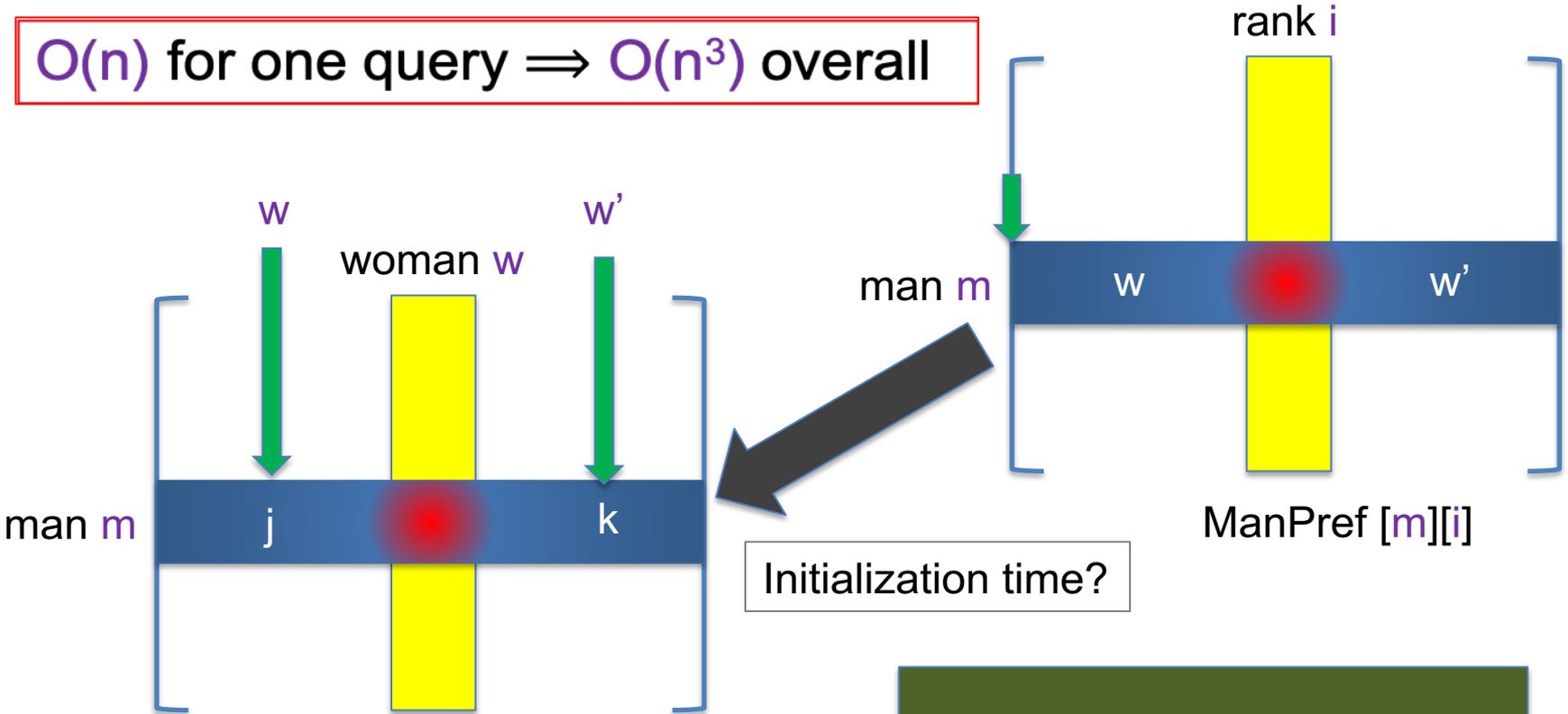
n^2 X (Query/Update(1-4))

Questions?



Answering Q4

$O(n)$ for one query $\Rightarrow O(n^3)$ overall



Initialization time?

$O(1)$ query time

$O(n^2)$ time overall

(4) How do we decide if m prefers w' to w ?

Puzzle

Prove that **any** algorithm for the SMP takes $\Omega(n^2)$ time

Main Steps in Algorithm Design

Problem Statement



Problem Definition



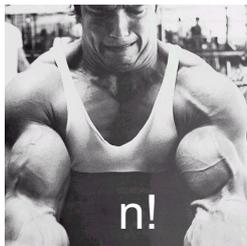
Algorithm



“Implementation”

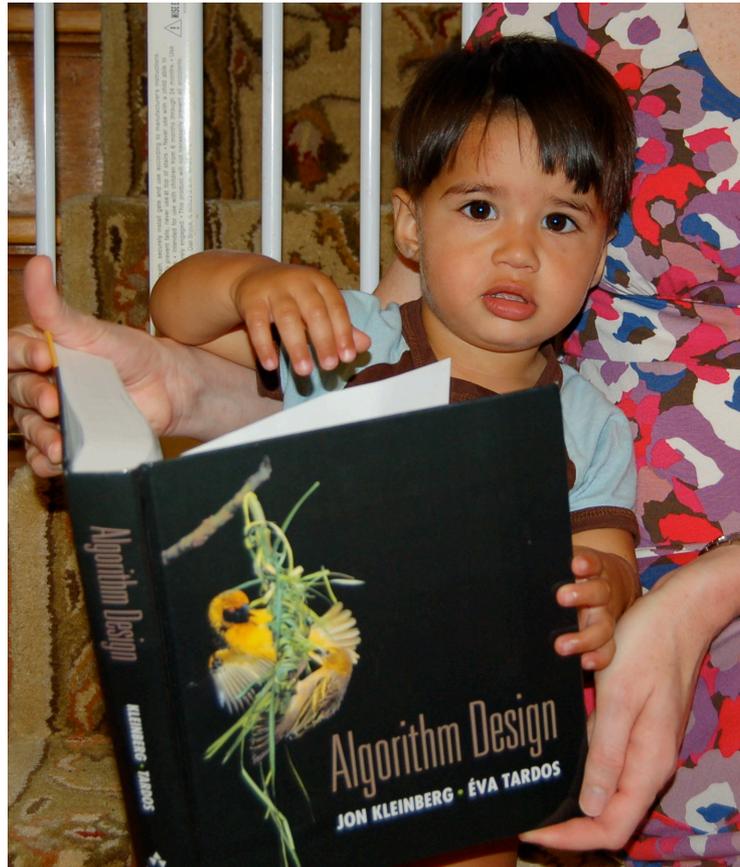


Analysis



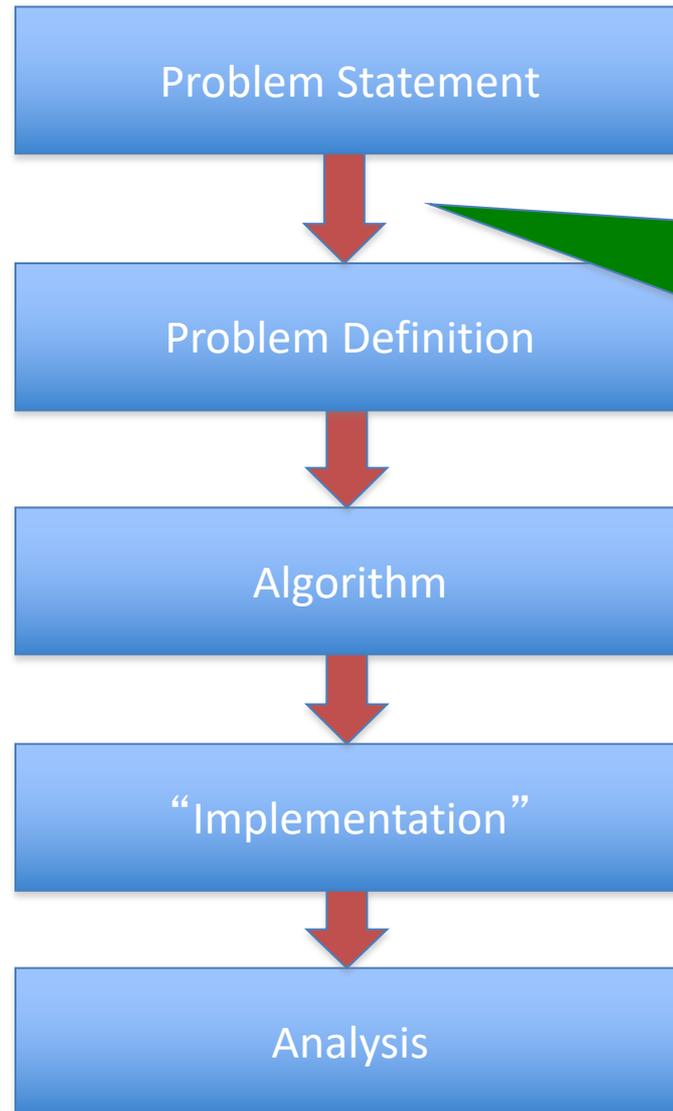
Correctness Analysis

Reading Assignments



Sec 1.1 and Chap. 2 in [KT]

Up Next....

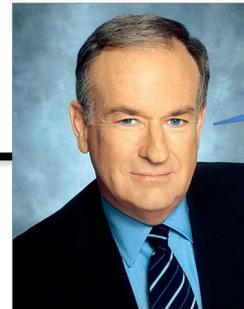


A generic tool
to abstract
out problems

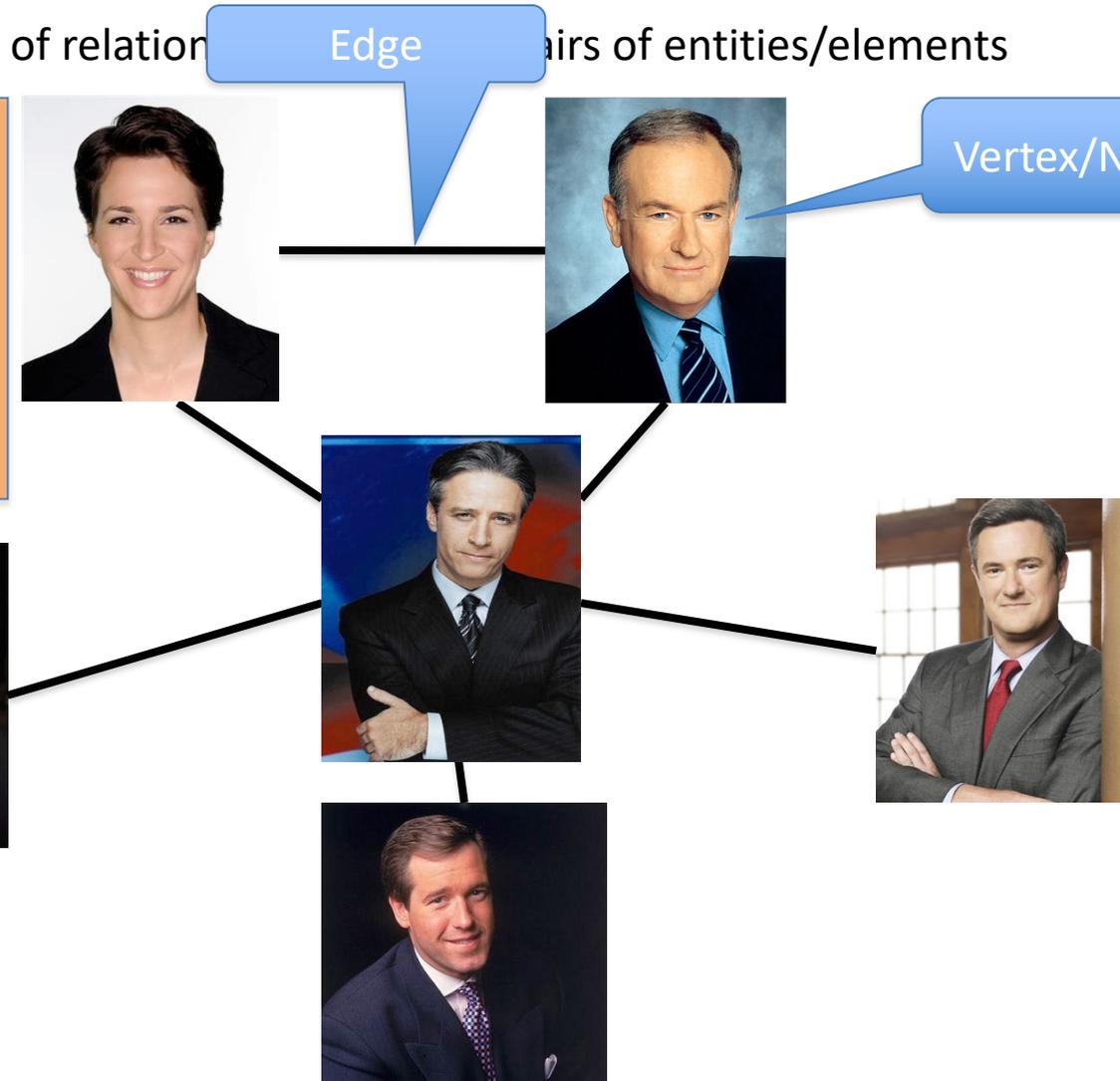
Graphs

Representation of relation **Edge** pairs of entities/elements

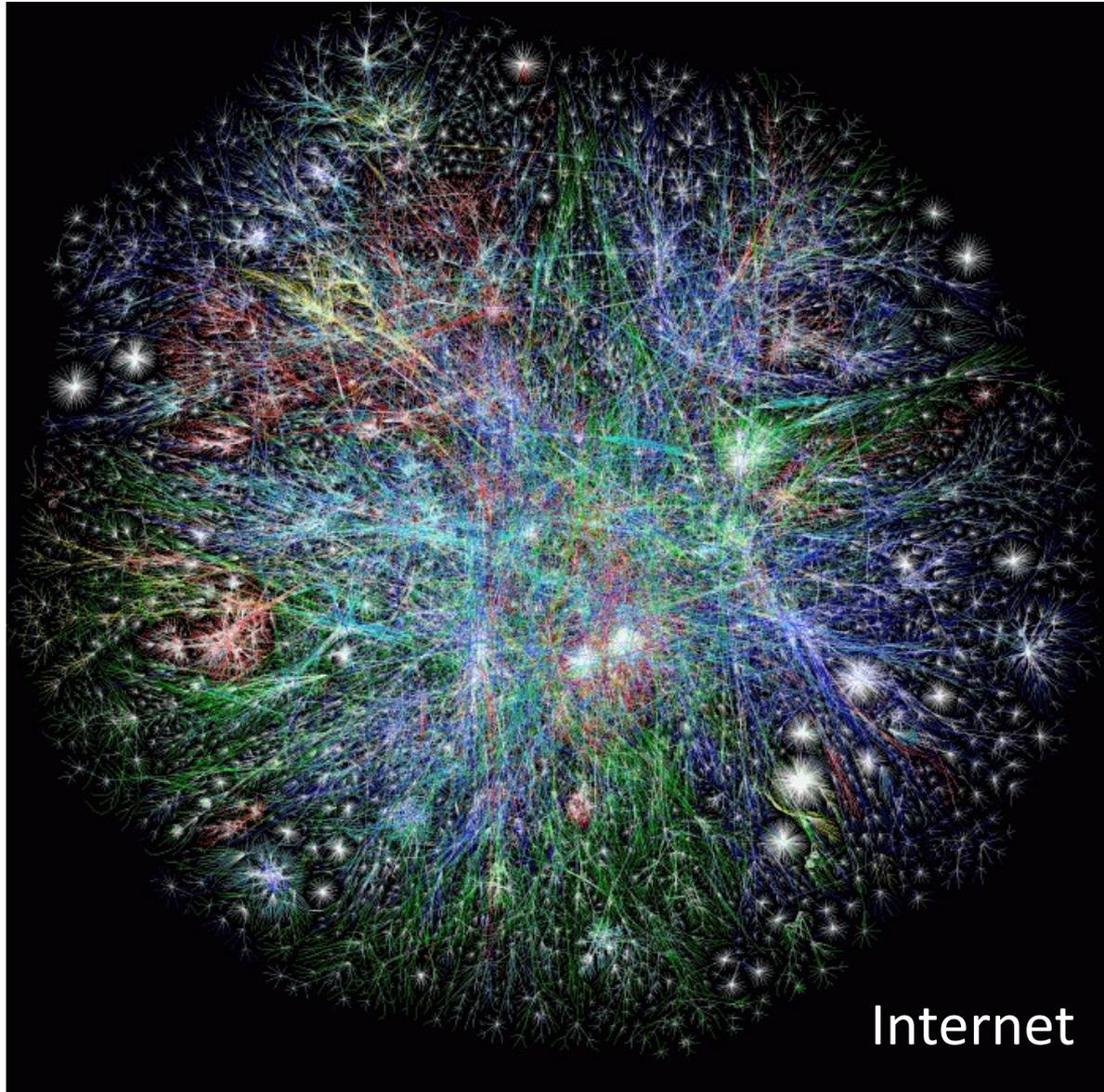
Entities: News hosts
Relationship: Mention
in other's program



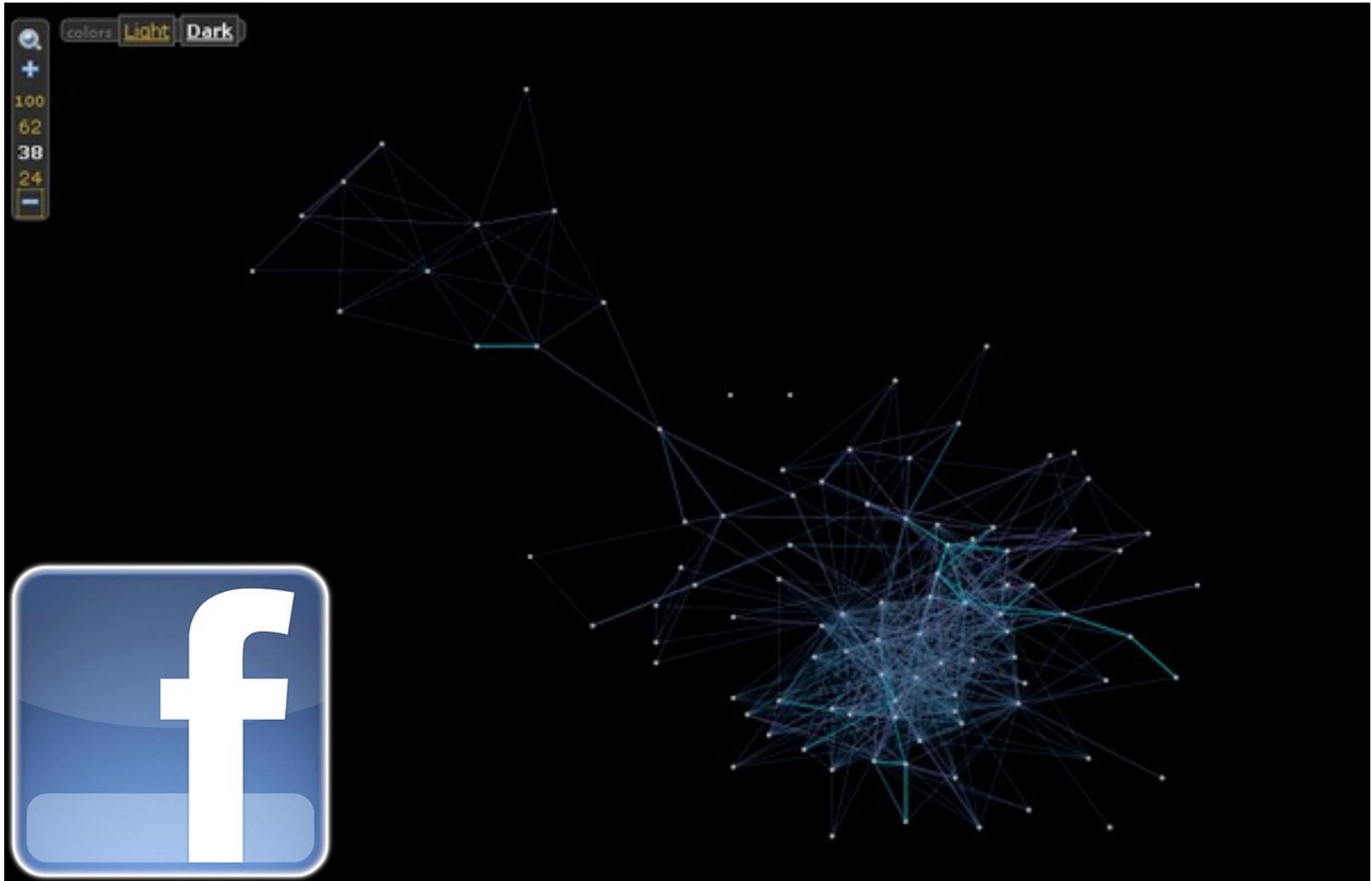
Vertex/Node



What does this graph represent?



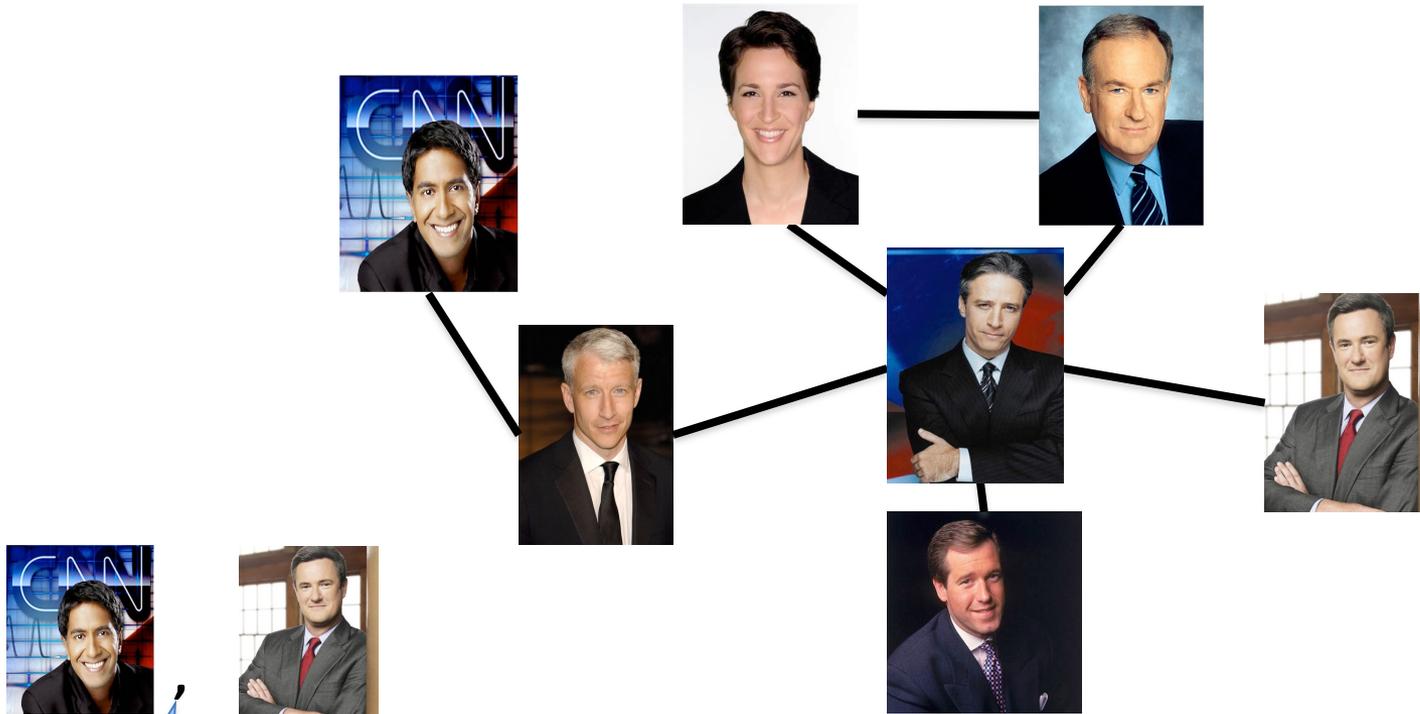
And this one?



Rest of today's agenda

Basic Graph definitions

Paths



Sequence of vertices connected by edges

Connected



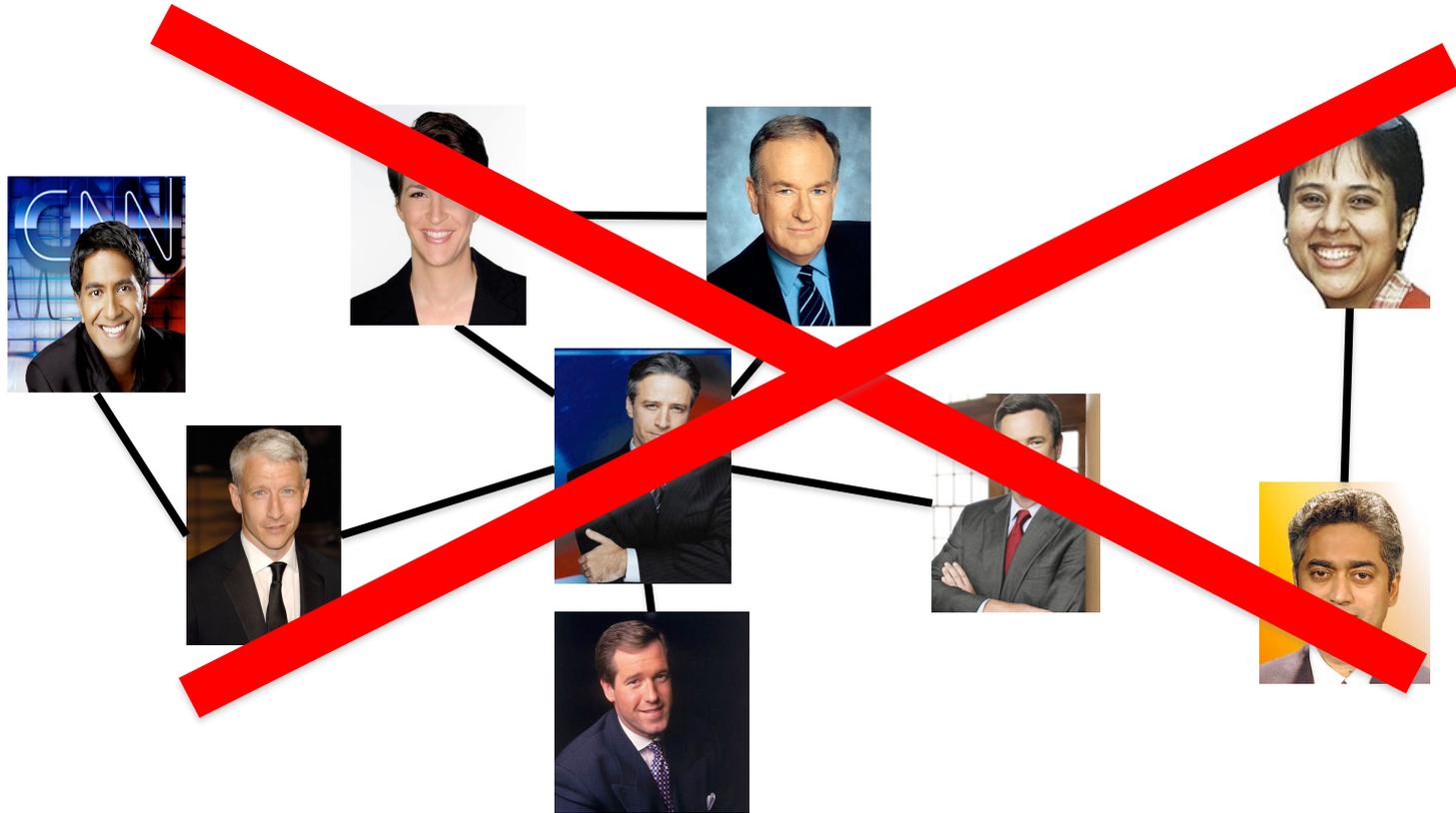
Path length 3

Connectivity

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

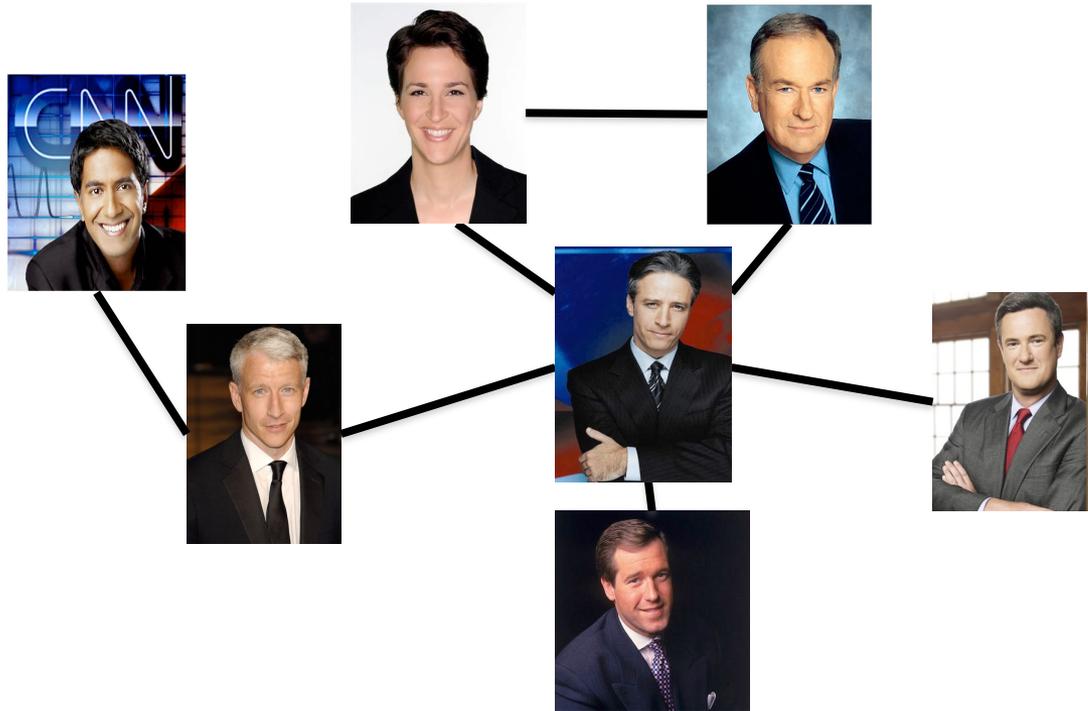
A graph is connected iff all pairs of vertices are connected

Connected Graphs

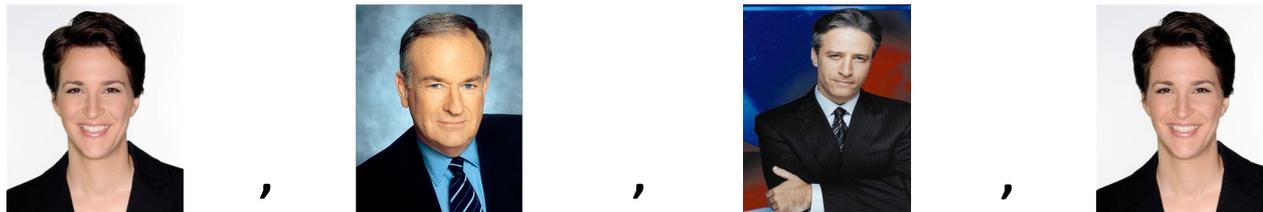


Every pair of vertices has a path between them

Cycles



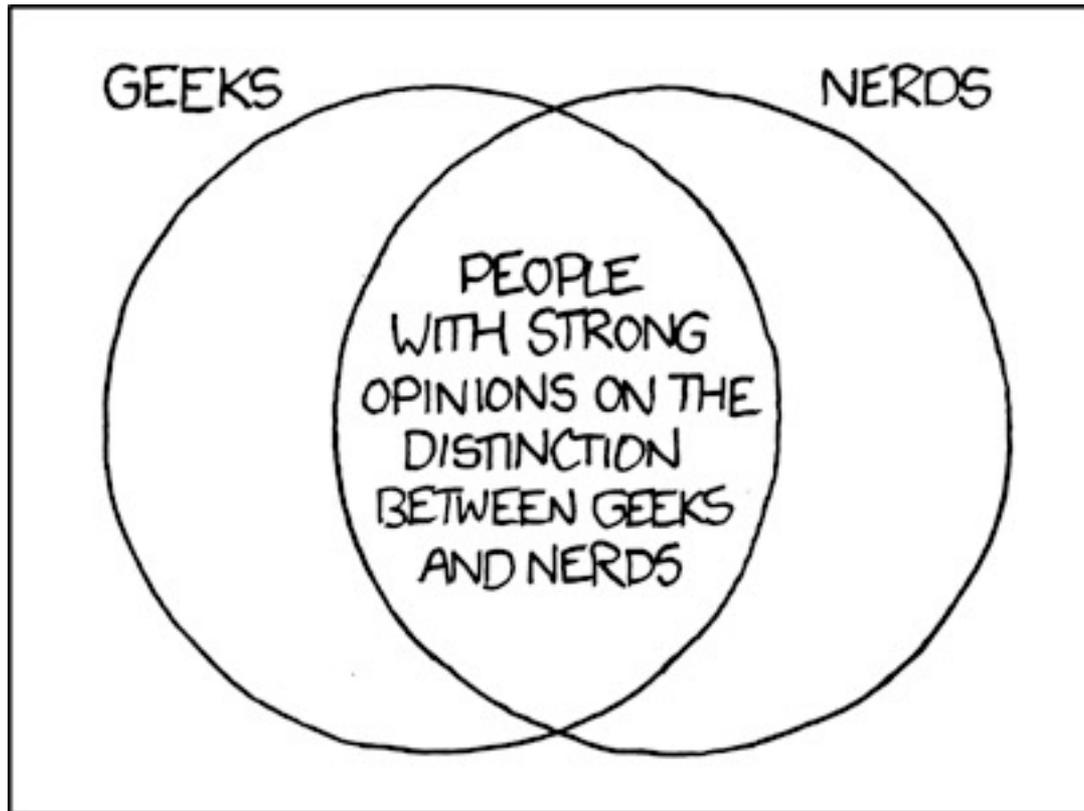
Sequence of k vertices connected by edges, first $k-1$ are distinct





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Formally define everything



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