

Lecture 7

CSE 331

Sep 15, 2021

Please have a face mask on

Masking requirement



UR requires all students, employees and visitors – regardless of their vaccination status – to wear face coverings while inside campus buildings.

<https://www.buffalo.edu/coronavirus/health-and-safety/health-safety-guidelines.html>

Register your project groups

Deadline: Friday, Oct 1, 11:59pm

CSE 331 Syllabus Piazza Schedule Homeworks + Autolab **Project +** Support Pages + channel Sample Exams +

Project Overview

Group signup form

Forming groups

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

- You have two choices in forming your group:
 - 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.

- 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.

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, October 1**.

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**.

HW 1 is out!

note @96

stop following views

Homework 1

Since this is the first homework, I'm releasing HW 1 a bit earlier than usual:

<http://www-student.cse.buffalo.edu/~abr/cse331/fall21/hws/hw1/index.html>

(You should also be able to access the page above via the "Homeworks" drop-down menu from the navbar up top on the [course webpage](#).)

Autolab will start accepting submissions for HW 1 starting 9am tomorrow.

homework 1

edit good note

Updated just now by Aki Rude

Working in groups

note @94

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Working in groups

During my office hour today some of you mentioned that students are feeling scared to form groups. Assuming this is not an isolated event, I wanted to state emphatically that **y'all are STRONGLY encouraged to work in groups for the homeworks** (you do not have a choice for the project since there is only one submission per group for the project).

As a practical reason why y'all should be working as a group, please note that Q2 on the HWs are supposed to be hard for a group! So if you are working alone, then you are setting yourself up for a lot of extra work that you do not need to. (If you do have a lot of free time in your schedule then working alone might be doable but for a typical schedule not working in groups is setting yourself up with a completely avoidable handicap.)

I was told the issue was fear of breaching academic integrity if you work on your HW as a group. So let me offer some clarifications/suggestions:

- It is true that you are only supposed to collaborate to the extent of proof/algorithm idea and not work on proof/algorithm details together. Also while taking notes during the discussion is fine, it is generally not a good idea to copy things down verbatim from the discussion. (But see next point.)
- A related worry is that even if y'all do the above, then the submissions within a group would still be similar that would lead to academic integrity violation. This is **simply incorrect!** We do understand that when collaborating together, the final submission would be similar (even if the submissions were written up individually) and this is perfectly acceptable! What we do not want is to receive essentially identical submissions— as graders, we can pretty easily figure out the difference between similarity due to (proper) collaboration and similarity due to copying.

Another worry raised was that students feel scared to talk to each other about the HWs. I would like to clarify something here:

- If the discussion is only to the extent of understanding the problem statement and not the solution, then y'all can talk with anyone else in class.
- **BUT** the moment the discussion veers towards how to solve the problem, then make sure those discussions are restricted to your group.

Please use the comments section if the above does not answer your fears about collaborating on homeworks and/or there are other issues that have not been addressed above!

[office hours](#) [logistics](#)

Just putting in time is not enough

You will be graded on *what you submit* and **not** how much time you spent

Be smart in how you spend your time

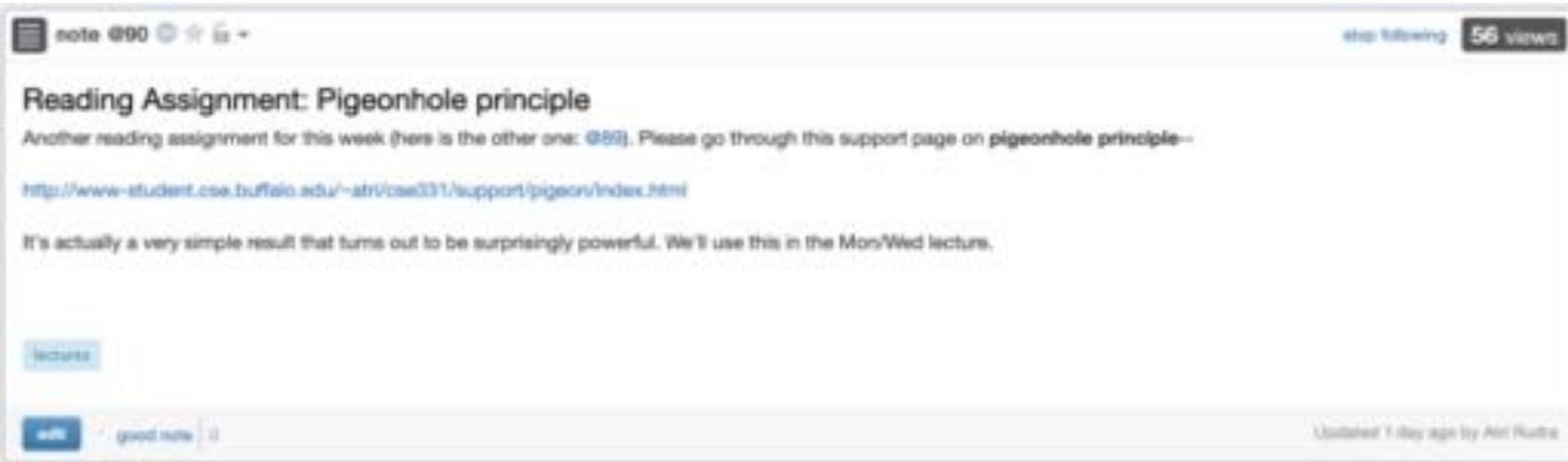
Please ask for help, get feedback if you get stuck!



Questions/Comments?



Read your reading assignment?



note @00 stop following 56 views

Reading Assignment: Pigeonhole principle

Another reading assignment for this week (here is the other one: @50). Please go through this support page on pigeonhole principle--

<http://www-student.cse.buffalo.edu/~atri/cse331/support/pigeon/index.html>

It's actually a very simple result that turns out to be surprisingly powerful. We'll use this in the Mon/Wed lecture.

lectures

edit good note 11

Updated 1 day ago by Ari Rudra

Gale-Shapley Algorithm

Initially all men and women are **free**

While there exists a free woman who can propose

Let w be such a woman and m be the best man she has not proposed to

w proposes to m

If m is free

(m,w) get **engaged**

Else (m,w') are engaged

If m prefers w' to w

w remains **free**

Else

(m,w) get **engaged** and w' is **free**

Output the engaged pairs as the final output

Observation 1

Initially all men and women are **free**

While there exists a free woman who can propose

Let w be such a woman and m be the best man she has not proposed to

w proposes to m

If m is free

(m,w) get **engaged**

Else (m,w') are engaged

If m prefers w' to w

w remains **free**

Else

(m,w) get **engaged** and w' is **free**

Once a man gets engaged, he remains engaged (to “better” women)

Output the engaged pairs as the final output

Observation 2

Initially all men and women are **free**

While there exists a free woman who can propose

Let w be such a woman and m be the best man she has not proposed to

w proposes to m

If m is free

(m,w) get **engaged**

Else (m,w') are engaged

If m prefers w' to w

w remains **free**

Else

(m,w) get **engaged** and w' is **free**

If w proposes to m after m' , then she prefers m' to m

Output the set S of engaged pairs as the final output

Questions/Comments?



Today's lecture

GS algorithms always outputs a stable marriage

The Lemmas

Lemma 1: The GS algorithm has at most n^2 iterations

Lemma 2: S is a perfect matching

Lemma 3: S has no instability

Questions/Comments?

