DESIGN USE BUILD

PAUL G. ALLEN SCHOOL OF COMPUTER SCIENCE & ENGINEERING

CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation!

Lecture 01: What is HCI?

Instructor: Amy Zhang, 9/30/2021

Welcome!! In these pandemic times...some reminders:

- Since it's hard to recognize faces with masks, **come make a name tag** at the front of the room.
- Remember to **keep your mask on** (over the nose) at all times! I will have extras here at the front if you happen to forget yours. **You can bring beverages** (but not food) into class and raise your mask to take a sip.

Today’s Topics

- UI Hall of Fame and Shame
- Introductions!
- What is HCI?
- Why is interaction design hard?
- Activity!
- Course Overview

UI Hall of Fame 🤩 and Shame 😨

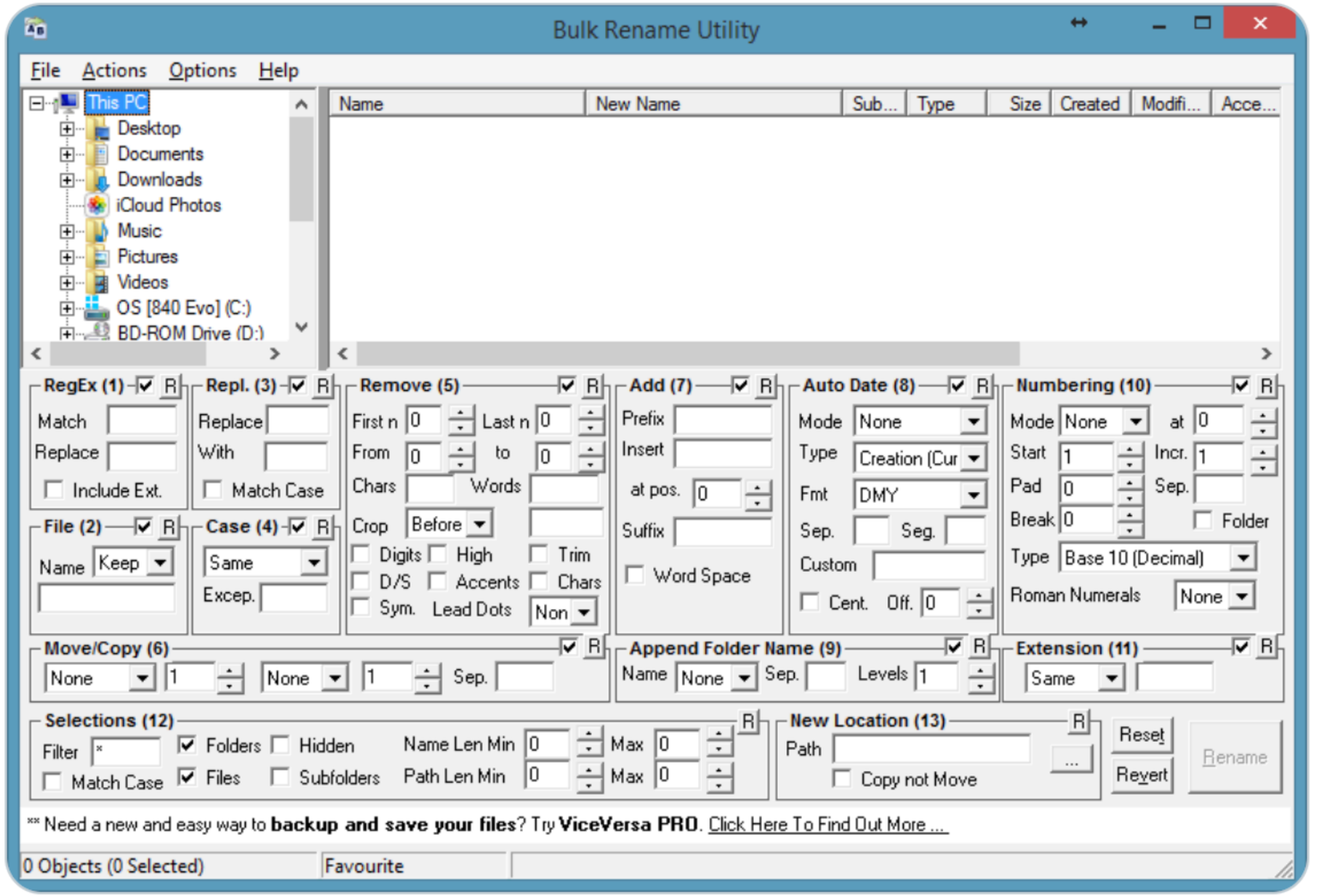
At the beginning of every lecture, we are going to take a look at a User Interface that is out there in the world and talk about whether it belongs in the UI Hall of Fame or Shame

If you come across any interesting ones to call out, post it in Ed!

First, some shames...

John Bellomy
@cowbs

Engineers don't let engineers design user interfaces.



What's wrong with this UI?

Introductions!

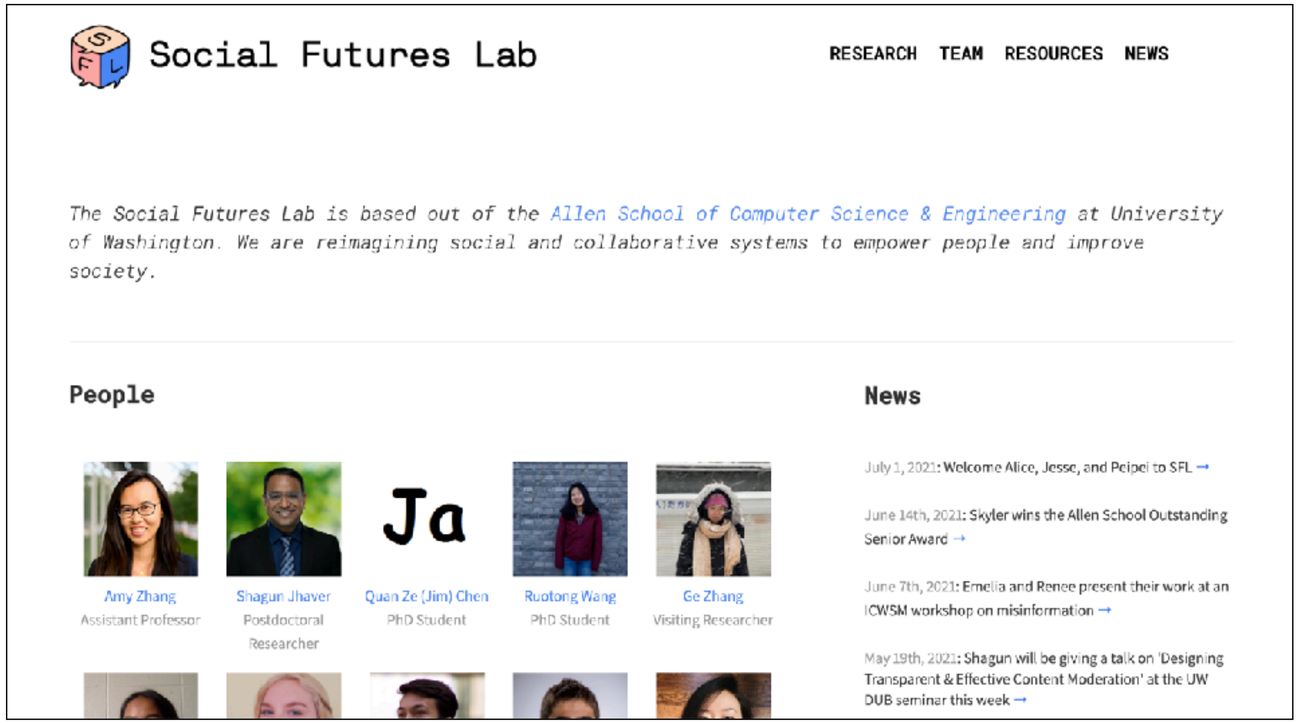
Instructor: Amy Zhang (she/her)

- I’m a new professor in UW CSE! I grew up all over the place - China, LA/Irvine, and Dallas, and then got my undergrad degree in CS at Rutgers. MPhil Cambridge, PhD MIT, Postdoc Stanford.

- I love hiking and travel (visited 11 national parks last year!). I am a foodie - I love eating Asian food and drinking boba, though I cannot cook.

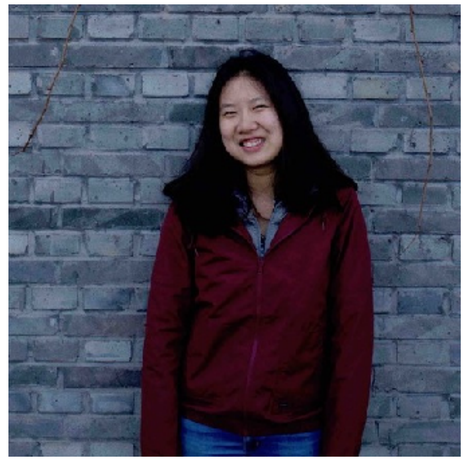
- I am a former competitive tennis player! I played tennis since the age of 5 and played NCAA Division I for Rutgers and also in the UK for University of Cambridge.

- My research is in an area of HCI called **social computing**.
- I work on how to better design and build all the software you use for social activity - from collaborative tools like Slack to social media like Instagram - and also look at all the cool and also terrible things we do together to each other online, from building Wikipedia to spreading COVID misinformation.



social.cs.washington.edu

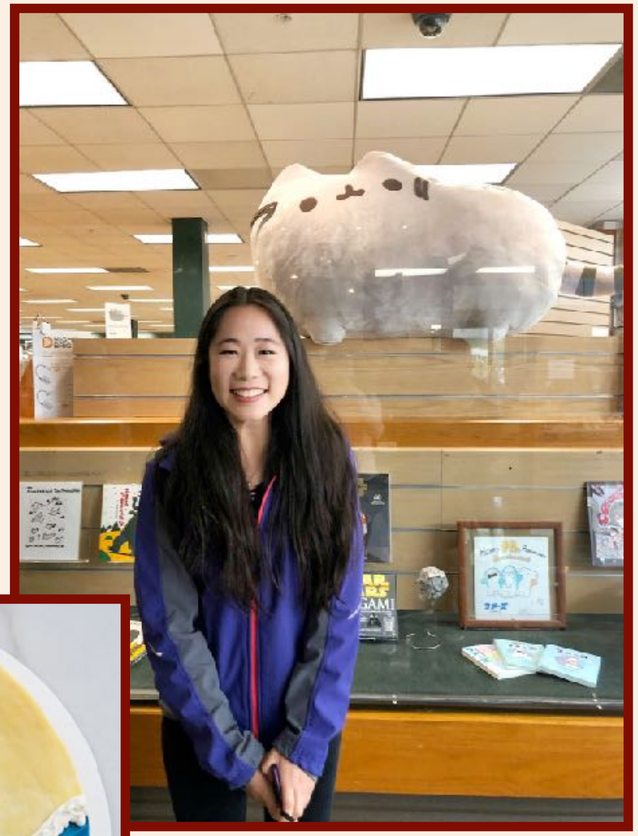
Ruotong Wang (she/her)



- I grew up in Beijing and went to college in Minnesota, graduated with degrees in Math and Sociology. And now, I am a 2nd-year PhD student in CSE at UW.
- I enjoy listening to stuff, music and podcasts. I also enjoy reading, cooking and walking around the city.
- I started hosting a podcast with my friends during the pandemic.

Lucy Jiang (she/her)

- I was born and raised in the greater Seattle area! I’m currently a junior studying Computer Science at UW.
- I love baking and decorating sweet treats (and eating them!) In my free time, I also enjoy skating, hiking, cooking, and exploring the city!
- I’ve been inline skating since I was 5, and I’ve been a Certified Skating Instructor for the past 9 years!

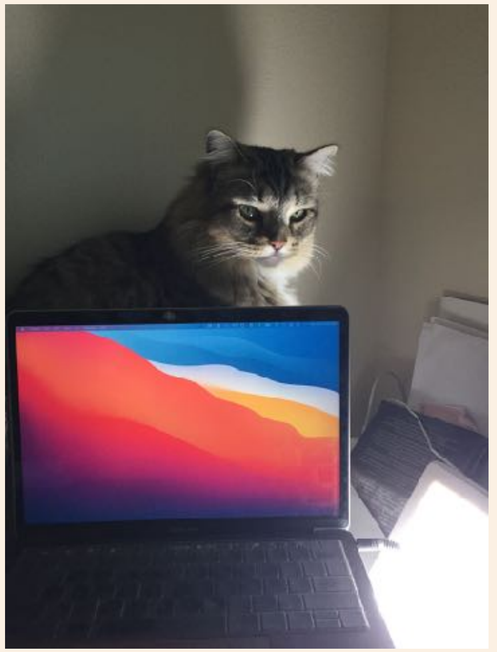


Andrew Tang (he/him)

- Born and raised about 40 minutes south of Seattle! I am a senior studying Interaction Design.
- I love to play, produce, and perform music, watch movies, try different sports, and play computer games.
- I’m in the Husky Marching Band! Ask me about my experience!

Christine (Chris) Geeng (they/she)

- I was born in New Jersey and went to Cornell University. I’m now a 5th year PhD student here in the Security and Privacy Lab.
- I love playing Nintendo games, painting cats, baking cakes, and thrifting.
- I’m working on being able to do one unassisted-pull-up.



Your turn!

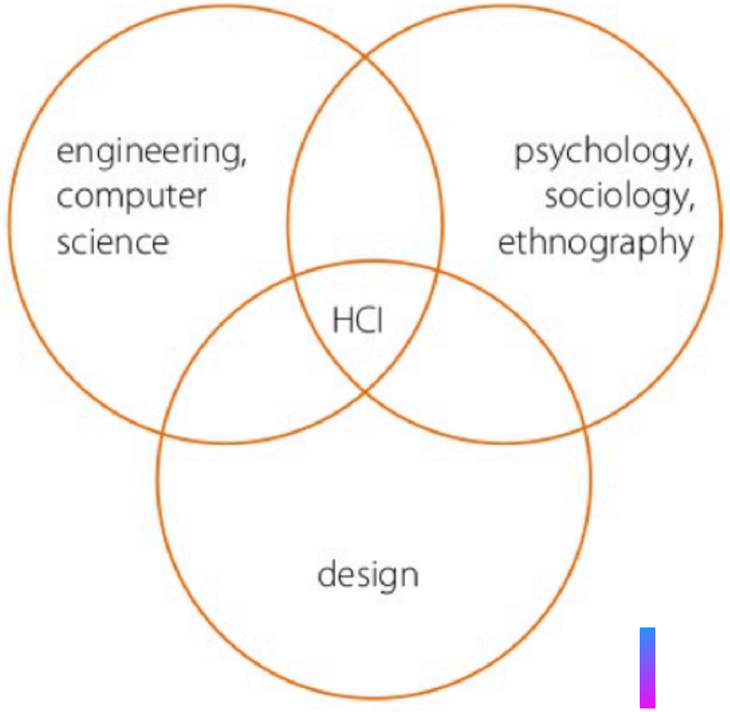
Get up and find one other person around you **that you don’t know already** and introduce yourselves!

- Name, where you’re from, year, major
- Favorite hobbies
- Something you did over the summer or an interest fact about you!

What is HCI?

Human-**C**omputer **I**nteraction

C



H

I

HCI is about the **design and use** of computer technology

https://www.slideshare.net/agaszostek/history-and-future-of-human-computer-interaction-hci-and-interaction-design

What is **design**?

- Design is about **making** things
- “[Design is] a plan for arranging elements in such a way as to best accomplish a particular **purpose**.” - Charles Eames *(designer of some famous chairs)*

What is an **interface**?

- “the place at which independent and often unrelated systems meet and act on or communicate with each other” - Merriam Webster dictionary
- This is the **interaction** part of human-computer interaction
- Humans and computers interact using an interface - and that interface is what we design!

Why is interaction design hard?

You are not the user!

- User interfaces are about communicating with users. **Users are NOT like you!**
- As the engineer, you already know a lot more about your application than any user will, and it’s difficult to un-learn it.
- What do we mean when we say “the user is always right”?

BUT don’t expect users to be designers either

1) Telephone handset weight

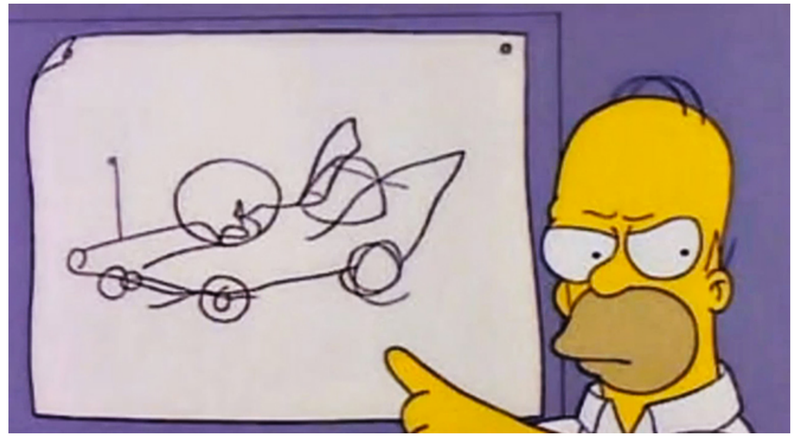
- users said: it’s fine! — but they wanted lighter

2) # of Google search results

- users said: 30 results — but they really wanted 10

3) Command abbreviations

- Users made 2x more errors with their own custom abbreviations



“I want a horn here, here, here, and here. You can never find a horn when you’re angry.”

1) Klemmer, Ergonomics, Ablex, 1989, pp 197-201

2) http://perspectives.mvdirona.com/2009/10/31/TheCostOfLatency.aspx

3) Grudin & Barnard, “When does an abbreviation become a word?”, CHI ’85

So how do you know what to design?

- **Answer 1**: Design as a **process**:
  - To synthesize a solution from all the relevant constraints
  - To frame, or reframe, the problem and objective
  - To create and envision alternatives
  - To select from those alternatives
  - To visualize and prototype the intended solution

- Bill Moggridge (co-founder of IDEO)

Design as a **process**

- Design process as **iterative** and **explorative**, constantly involving **users** and investigating **use**, since we can't just trust our instincts
- Group project - propose and carry out an end-to-end design process

Talk to people, investigate problems

Sketching and Storyboarding

Low-fidelity Prototyping

Digital Mockup

Presentation & Communication

So how do you know what to design?

- **Answer 2**: Design as an open-ended **series of principles**:
  - Usability: how well users can use the system’s functionality
    - Learnability: how easy is it to learn?
    - Efficiency: once learned, how quickly can it be used?
    - Safety: are errors few and recoverable?
  - Accessibility
  - Aesthetics, minimalism
  - Ergonomics
  - Expressivity, flexibility
  - Malleability, control

Which principles to emphasize depends on context

- There are **trade-offs** between different design principles, so you can’t just apply them mindlessly
- Emphasis depends on the **user**
  - Novice users need greater learnability
  - Expert users need efficiency
  - But everyone can be a novice or an expert at different points in time
- Emphasis depends on the **task**
  - Highly critical tasks should emphasize safety (amber alert system)
  - Less critical, repetitive tasks need efficiency (unlocking your smartphone)

There are also other trade-offs

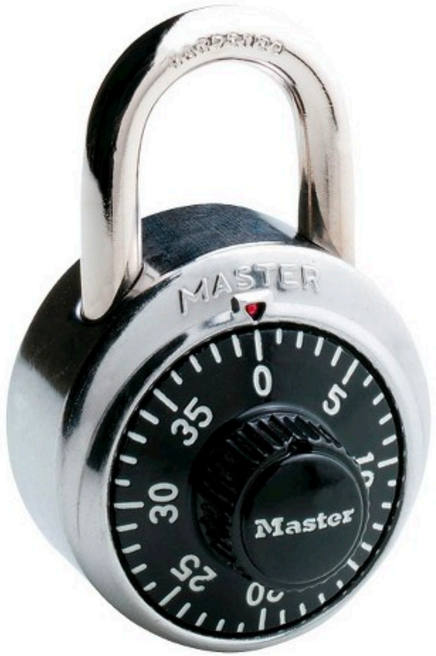
- Software builders have a lot to worry about!
  - functionality
  - security
  - performance
  - maintainability
  - cost
  - reliability

- Some of your other CSE courses focus on these other attributes
- But we'll mostly ignore these trade-offs in this class in favor of how well the interface addresses a **problem that people have** and how successful is the interface for people to **achieve their goals and tasks**
- Just like with these other attributes, we have to think about constraints —but now, we add humans' physical, mental, and social constraints in *addition* to physical constraints of machines

Objectives of this Course

- **Process**-focused perspective on interaction design
- Learn **design principles** and **heuristics**
- Learn **design methods** such as **user** research methods, **task** analysis
- Create **design artifacts** for communicating and thinking through your intermediate design: scenarios, sketches, storyboards, prototypes
- Rapid prototyping and **iteration** of design, coupled with user testing and other evaluation methods
- **Critical** perspective on design solutions
- Learning communication skills and design **critique**

Activity! (10 min)



- With a partner, take a look at the lock in front of you and try to use it.
- Discuss: How easy is it to learn how to use this lock? How efficient is it for locking and unlocking? Can you recover easily when you mess up while trying to use it?
- Think back and try to remember problems you may have encountered when trying to use locks of any kind.
- What aspect of the design of the lock related to the problem?
- Design and then sketch a new lock that addresses the problem.
- **Individually** fill out and upload your sketch to: https://www.yellkey.com/likely (permalink: https://forms.gle/MS3gPHYFEiiS2WdB6)

Course Overview

Course Structure

- **Tuesdays** and **Thursdays** we have lecture and in-class activities, along with group work or group presentations with feedback sometimes.
- **Fridays** we have section. Section is primarily studio time led by TAs, where you will participate in group presentations and give feedback.
- As you can see - **active participation** is a huge component of the course! Every group is counting on everyone else for rapid feedback.
  - Talk to us if you are feeling sick or need to quarantine to get permission to use remote synchronous options.

Communication

- Check the **website** or **Canvas** for syllabus, assignments, schedule, lecture slides, recordings.
- Turn in group assignments in **Gradescope**.
- Post questions to **Ed** or to cse440-staff@cs.washington.edu (always reply-all!)
- Office Hours Wed 12:30-1:30PM in CSE2-202 or on my Zoom: https://washington.zoom.us/my/amyxzh.
- **Do not message or email any of the TAs individually!** It's not their job to respond to you outside of work, also other students and staff may benefit from hearing your question.

Submissions and Deadlines

- This class has a **lot of group assignments** (16 in fact, over 10 weeks! So the pace is about 1-2 per week).
- To help you keep track, every Monday, I will send an email about the upcoming week's lecture topics and assignment deadlines. See website for the overview schedule. Assignments are typically due Mondays or Thursdays at 11AM.
- Remember that because we have a lot of assignments, **each one is very small** in terms of points towards your final grade. I encourage you to not overly stress about any one assignment.
- We do not have a systematic late policy. Generally, if you could use some extra time up to 24 hours, just let us know (before the deadline!), and we will work with you. We still encourage you to **get things in on time**, just given the pace of the class and so you can get timely TA feedback.

Exam and Presentations

- No final - instead, we have an **exam** on Thurs Dec 2, which is tentatively going to be a 24 hour take-home open-book exam (25/100 points).
- We will also have a final **poster and demo session** on Thurs Dec 9 during class time with outside judges and visitors (TBD on in person or remote).

Upcoming schedule

- In tomorrow's section, you'll meet your TAs and fellow section members and work on forming groups of 3-4 people.
- **Next week** (I will send an email on Monday reminding about all this):
- Please turn in your final group name and members to us by Monday via this form: www.yellkey.com/enjoy (permalink: https://forms.gle/ESJSDahmymmd9G5k7) Remember, all group members must be in the same section.
- Assignment 1a is due next Thursday at 11AM and is out on Canvas. We will discuss it more on Tuesday, and there will also be some class time on Tuesday to work on it.

That's all! See you tomorrow!

Turn in your name tags on your way out so we can reuse them next time. Return any pens.