

CSE 121 – Lesson 12

Miya Natsuhara

Autumn 2023

Music: [121 23au Lecture Tunes](#) 



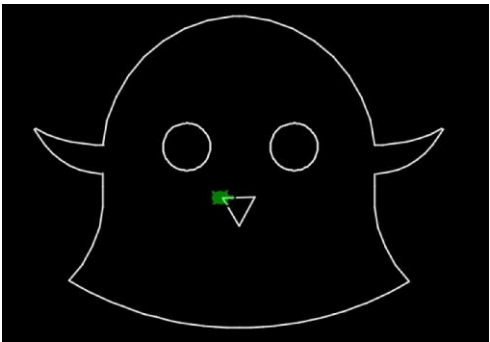
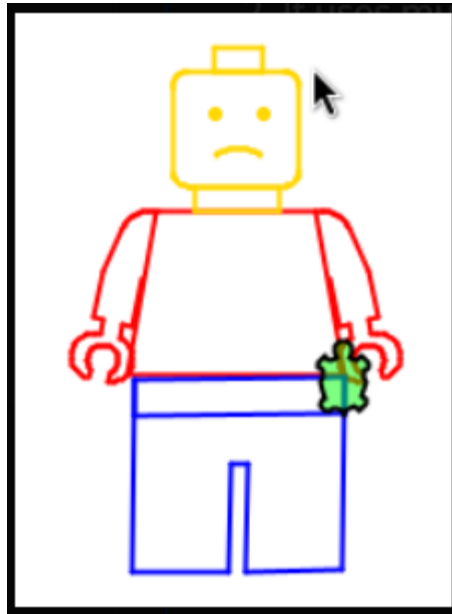
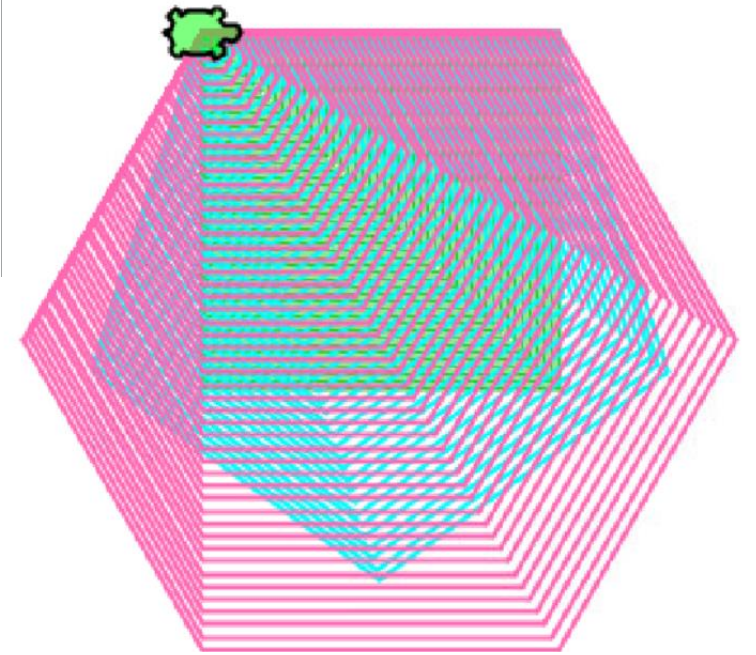
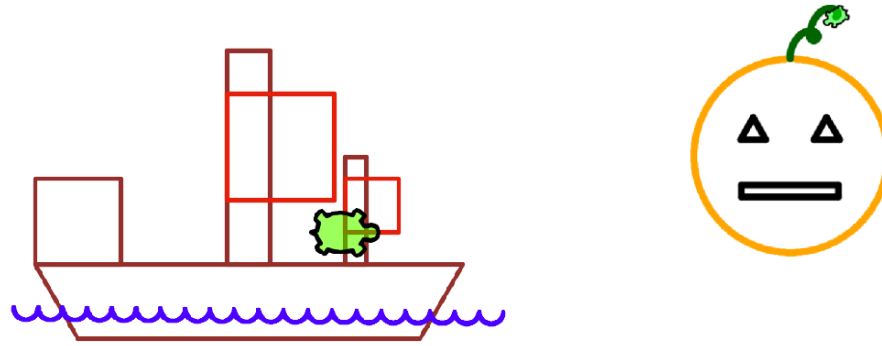
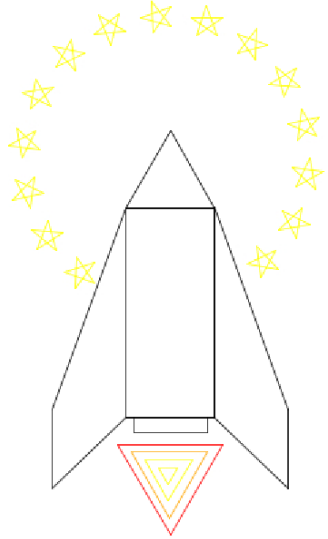
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TAs:	Trey	Christina	Sahej	Vinay	Kriti
	Sebastian	Colton	Anju	Maria	Minh
	Annie	Janvi	Jonus	Shreya	Vivian
	Jasmine	Arkita	Lydia	Andy	Nicole
	Christian	Vidhi	Luke	Nicolas	Simon
	Lucas	Ritesh	Andras	Shayna	Jessie
	Logan	Hibbah	Archit	Hannah	Lydia
	Jacob	Julia	Ayesha	Aishah	Yijia

Announcements, Reminders

- University holiday on Friday (11/10) – Campus is closed!
 - No class session
 - No IPL
 - No Miya office hours
- Programming Assignment 2 deadline extended
 - Now due **Tuesday, Nov 14**
- Quiz 0 grades posted
 - See [announcement](#) for details
 - Quiz 1 will be graded once make ups have been completed (for students who were sick on Quiz 1 day)

C2 Art!



Edge Cases! (And Testing)

When writing a method, especially one that takes input of some kind (e.g., parameters, user input) it's good to think carefully about the assumptions you can make (or cannot make) about this input.

Edge case: A scenario that is uncommon but possible, especially at the "edge" of an input's valid range.

- ? Are we sure that all possible months are handled?
- ? Are we sure that all possible days are handled?
- ? Are we sure that all possible combinations of months and days are handled?

Prioritizing Patients

Consider the specification where we determine a "priority score" for a patient.

The specification asks you to use a formula that takes into consideration:

- The patient's **age**
- The patient's **zip code**
- Whether the hospital is **in-network** for the patient's insurance
- The patient's **pain level**
- The patient's **temperature**

Prioritizing Patients

- Take a second to reflect – what does it mean to assign people "priority" in terms of healthcare?
- When assigning somebody a priority score, what factors go into it?
- Do the factors that we think are relevant reflect other social factors inadvertently?
 - For P2, we chose age, zip code, in-network, pain, temperature – can we think of any way these might introduce bias?

Prioritizing Patients

- Research and reports from 2019 indicated algorithms for patient prioritization and allocation of care systematically privileged white patients over black ones (algorithm being used in the care of ~70 million patients)
- Did not consider race, but made a key assumption: those with the greatest care needs will benefit most from the program (and should have priority).
 - Used health costs as a proxy for "care needs"
 - People with lower incomes tend to have lower health costs because they don't have insurance, time off work to get medical care, etc.
 - Socioeconomics compound with historical disenfranchisement of Black Americans, with correlate with lower on average economic bracket.

Prioritizing Patients

- So racial bias can exist algorithmically.
 - How? Aren't computers supposed to be unbiased and neutral?
 - What is the impact of that in healthcare?
- Study (Obermeyer et al 2019) finds that, with this health care costs serving as a proxy, resulted in:
 - An estimate that the algorithmic racial bias reduced the number of patients who were black to be flagged needing extra care by more than half
 - American Association for Advancement of Science (AAAS) indicates that black patients were assigned same risk/prioritization level, but were substantially sicker than white patients and were not given the appropriate level of care as a result.

Prioritizing Patients

What's the takeaway?

- Computer Science is not neutral, and the work we can do can easily reify already-existing social biases, whether we intend to or not.
- We need to be actively mindful of the assumptions we make in our implementations.
 - In P2 specifically, is using zip code as a proxy for priority potentially unethical?
 - Who is included?
 - Who is excluded?
- CS does not exist in a vacuum – be mindful, reflect, and more than anything...continue to "debug" socio-technical issues!