Lecture 17

CSE 331

Oct 4, 2024

Upcoming exams

Mid-term 1 on Mon Oct 7

Mid-term 2 next Wed Oct 9

Mid-term post 1

note @134 stop following 38 views

Actions

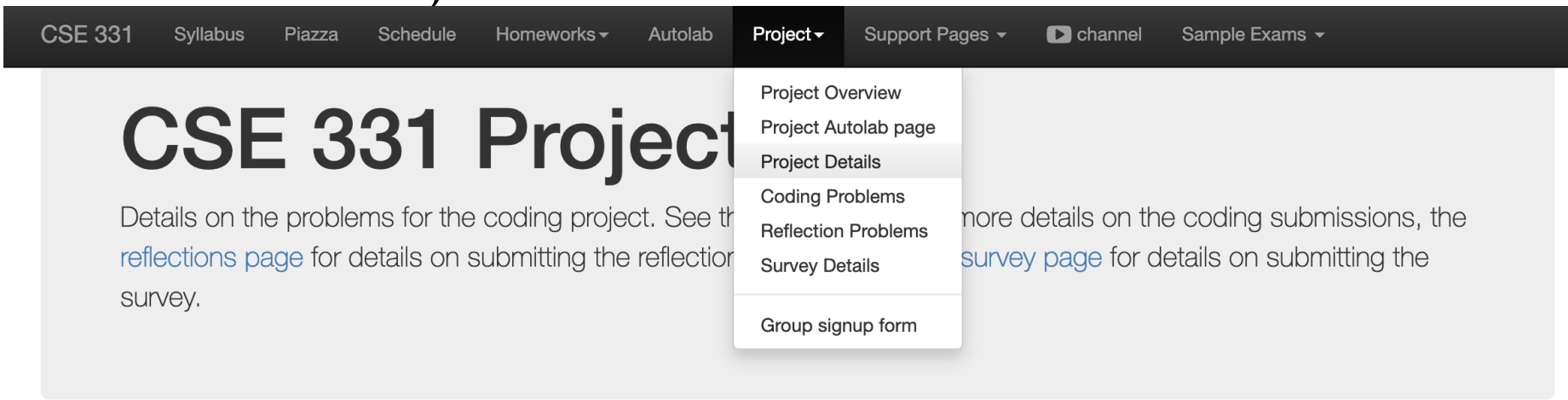
The mid-term post

First, midterm-I is on **Monday, Oct 7** and midterm-II is on **Wednesday, Oct 9** during the usual class timings (i.e. 11:00-11:50am in KNOX 104). Below are some comments that might be helpful to prepare for the mid-term.

(Thoughts on what to do *during* the exam here: @135)

- Work through the sample mid-term exams (@133). Do **not** use the sample mid-term to deduce **anything** about the relative coverage of different topics. (See points below for more on the coverage.) The sample mid-terms are meant for you to see the format of the questions. The *actual mid term exams will be harder than the sample mid term exams*. The actual mid-terms will follow the exact same format for the sample midterms: i.e. first mid-term will be only T/F while the second ones will be longer ones.
- I encourage you to not look at the solutions to the sample mid-terms before you have spent some quality time by yourself on the mid-term questions first.
- Use the quiz on Sep 30 (@126) to get some practice in solving T/F questions under some time pressure. Also review the T/F polls (@41) for more examples of such T/F questions.
- Review the HW problems/solutions. HW solutions are here: @46.
- You **will** be under (a bit of) time pressure in the mid-term exams-- it might be useful for you to use the sample mid-term to decide on how much time you are going to spend on each question. Also read the instructions on the first page and keep them in mind during the exam (the instructions will of course be repeated on the exam sheet).
- If you need help attend the usual recitation (recitations next week will be review sessions) and office hours.
- The exam will be closed book and closed notes. However, you can bring in **one** 8.5" X 11" review sheet. (If you prefer you can bring in different review sheets for the two mid-term exams.) You can write anything that you want on the sheet as long as it is one sheet (you can use both sides). It can hand-written or typed up doesn't matter-- however, you are not allowed to bring in a magnifying glass. The review sheet is to make sure you do not spend time memorizing definitions etc. but can concentrate on the main ideas in the material we have covered. The exam (as you can probably make out from the sample mid-term) will focus on how well you understand the material and not how well you can memorize. However, see next point.
- **Do not spend too much time cramming stuff into the review sheet**. In my experience (both as a student and instructor), it never helps to just put in arbitrary stuff. **However, you should use the review sheet to write down references for various algos etc. we have seen in class/HWs/recitation notes etc., so that you can just read off the reference during the exams.** Here are some of suggestions on what to put in your cheatsheet:
    - If there are things that you cannot for whatever reason remember, note those down.

Project has been released!



Acknowledgment

The development of the project was supported by a Mozilla Responsible Computer Science award. The support is gratefully acknowledged.

Some Suggestions and Warnings

While this coding parts of the project is somewhat similar to Question 3s on the homework, there are some crucial differences and we wanted to highlight few things for y'all upfront:

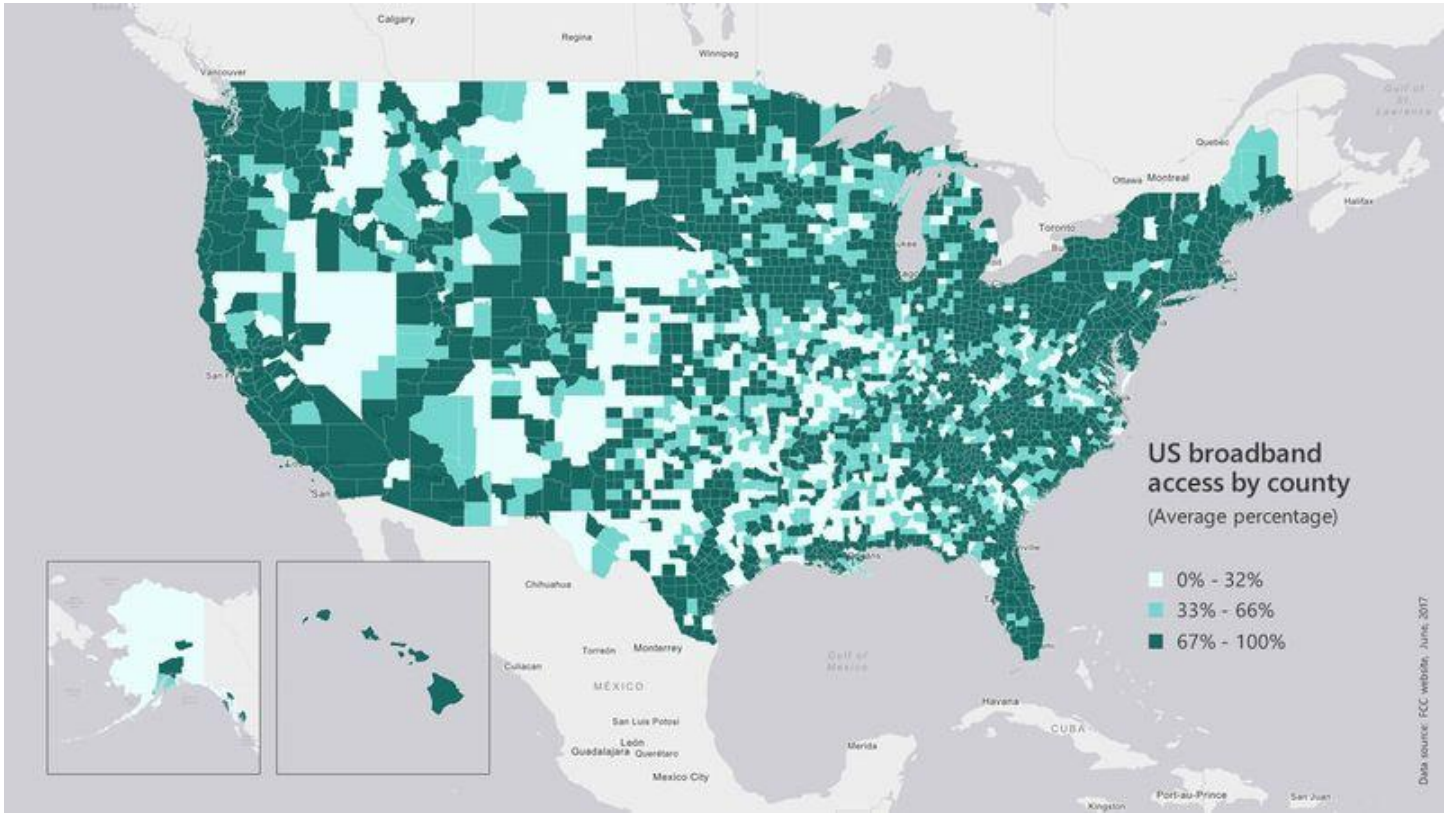
Form groups of size EXACTLY 3

This is a group project (unlike Q3s on the HWs that had to be done individually) and you can work in groups of size **exactly 3**. The submissions will be on Autolab and *everyone in the group will get the same grade.*

Groups should agree on one programming language

While the submission for the coding problems in this project can be done in any of `C++,Java` and `Python` like in Question 3s on the homework, we **highly recommend that the group agrees on one programming language for the group**. This will make it much easier for your group to make progress and collaborate.

Broadband access



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Lawsuit against Spectrum

FILED: NEW YORK COUNTY CLERK 02/01/2017 12:05 AM INDEX NO. 450318/2017
NYSCEF DOC. NO. 1 RECEIVED NYSCEF: 02/01/2017

SUPREME COURT OF THE STATE OF NEW YORK
COUNTY OF NEW YORK

----------X

THE PEOPLE OF THE STATE OF NEW YORK, by ERIC T. SCHNEIDERMAN, Attorney General of the State of New York,

Plaintiff,

-against-

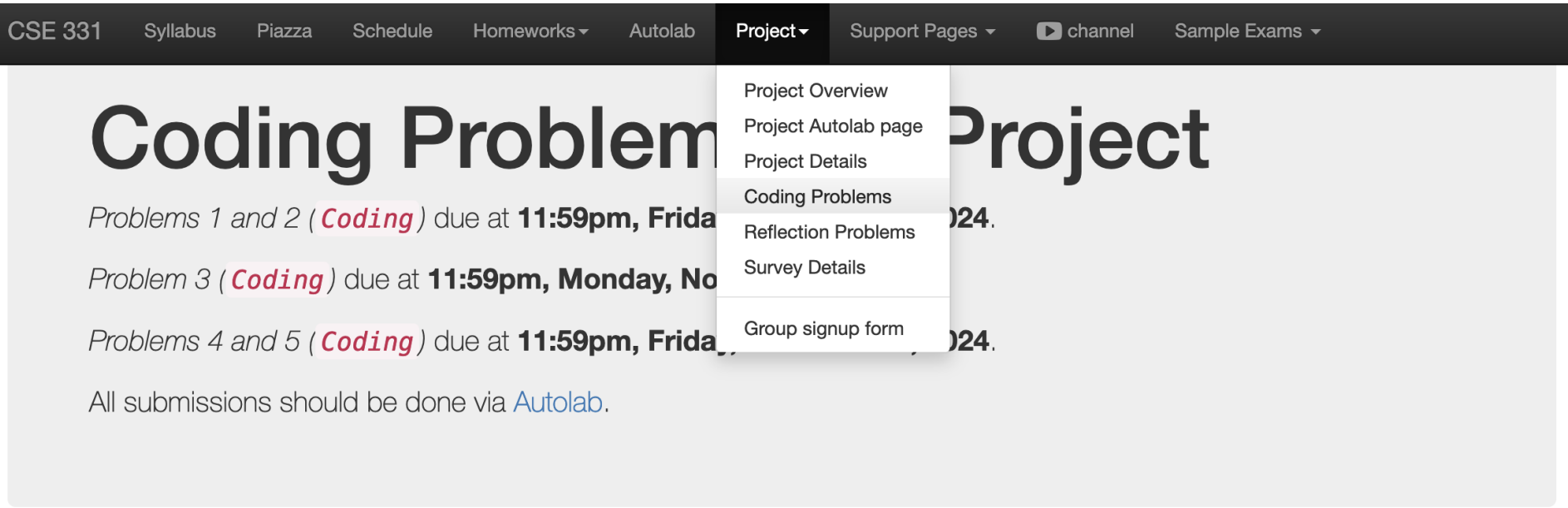
CHARTER COMMUNICATIONS, INC. and SPECTRUM MANAGEMENT HOLDING COMPANY, LLC (f/k/a TIME WARNER CABLE, INC.),

SUMMONS

Index No.: 450318/2017

Plaintiff designates New York County as the Place of Trial

Five coding problems



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Each like a HW Q3

Java | Python | C++

Directory Structure

You can get full credit with code length along the lines of Q3 submissions!

More work to UNDERSTAND the problem

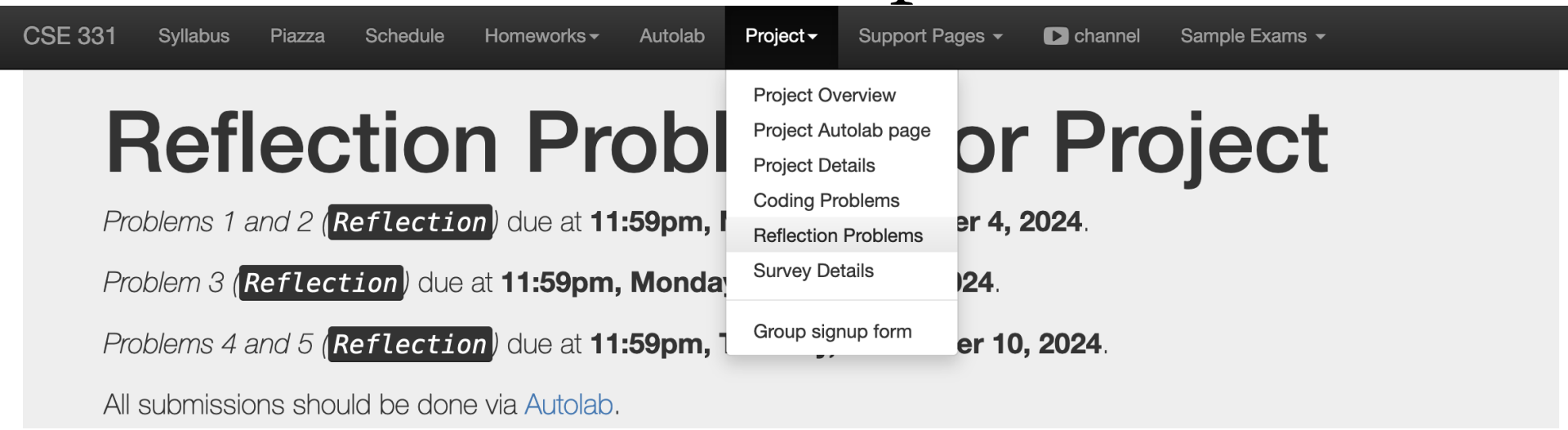
You are given ten coding files. Out of these, you can safely ignore `Enums.py` and `LinkedList.py`. The ... ound. For example, `Enums.py` is used in conjunction with the file I/O code. `LinkedList.py` is an implemen...

`Driver.py` takes the input file, parses it using `Utility.py` and calls your `Solution.py` class' ... output by you (along with, depending on the question, the updated bandwidths and packet priorities) are pass... ...sses them and determines the routing delay faced by each client. Finally, these delays are passed into the revenue ca... ...evenue you gathered based on your routing decisions. You only need to update the `Solution.py` file. You may write your own help... ...t.

The `Solution` class contains four data structures.

- `problem`, which simply contains the problem number of the current template as a member variable on the Solution class. You DO NOT need to worry about this variable.
- `isp` which is the ID of the ISP node. Note that this is the same as content provider or i as mentioned in the problem description.
- `graph` which is the input graph G in the adjacency list representation that you are familiar with. The key is a node ID (not client, there are nodes that may not be clients) and

Five reflection problems



There is no "right" or "wrong" answer

Perhaps the biggest difference from other CSE 331 questions (both programming and proof based questions) is that pretty no much no answer is "right" or "wrong" in any absolute sense. Y'all will notice that for some of the questions, the answer might depend on some of the assumptions you make -- and in many cases the answer would really depend on *who* is answering the question. While ambiguity might feel a bit disquieting, the **ambiguity is inherent** for these kinds of questions: so embrace the ambiguity!

More specifically, do not waste your time trying to figure out what *I* am expecting from an answer-- because I do not have any set answer that I'm looking for! What I am interested is in hearing your group's thoughts on the questions. In particular, **even if I disagree with your justification, that does NOT mean you will get penalized**. Again there is no "right" or "wrong" answer!

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Reflect on your design choices

Algorithm Idea (2 points)

In one paragraph, state the algorithm idea behind the code that you submitted for the second coding problem. This would be similar to a usual algorithm idea submission in a homework.

Whom does your algorithm work best for? (2 points)

What clients does your algorithm try to make their pen_0 value to be 0? I.e. for which clients c does your algorithm try to make sure to try get the pmt_c revenue from them? Show how your answer follows from the algorithm idea above.

Whom doesn't your algorithm work well for? (2 points)

What clients does your algorithm *not* try (actively) to make their pen_0 value to be 0? I.e. for which clients c does your algorithm not mind to get a revenue of c from them? Show how your answer follows from the algorithm idea above.

How fair is your algorithm? (4 points)

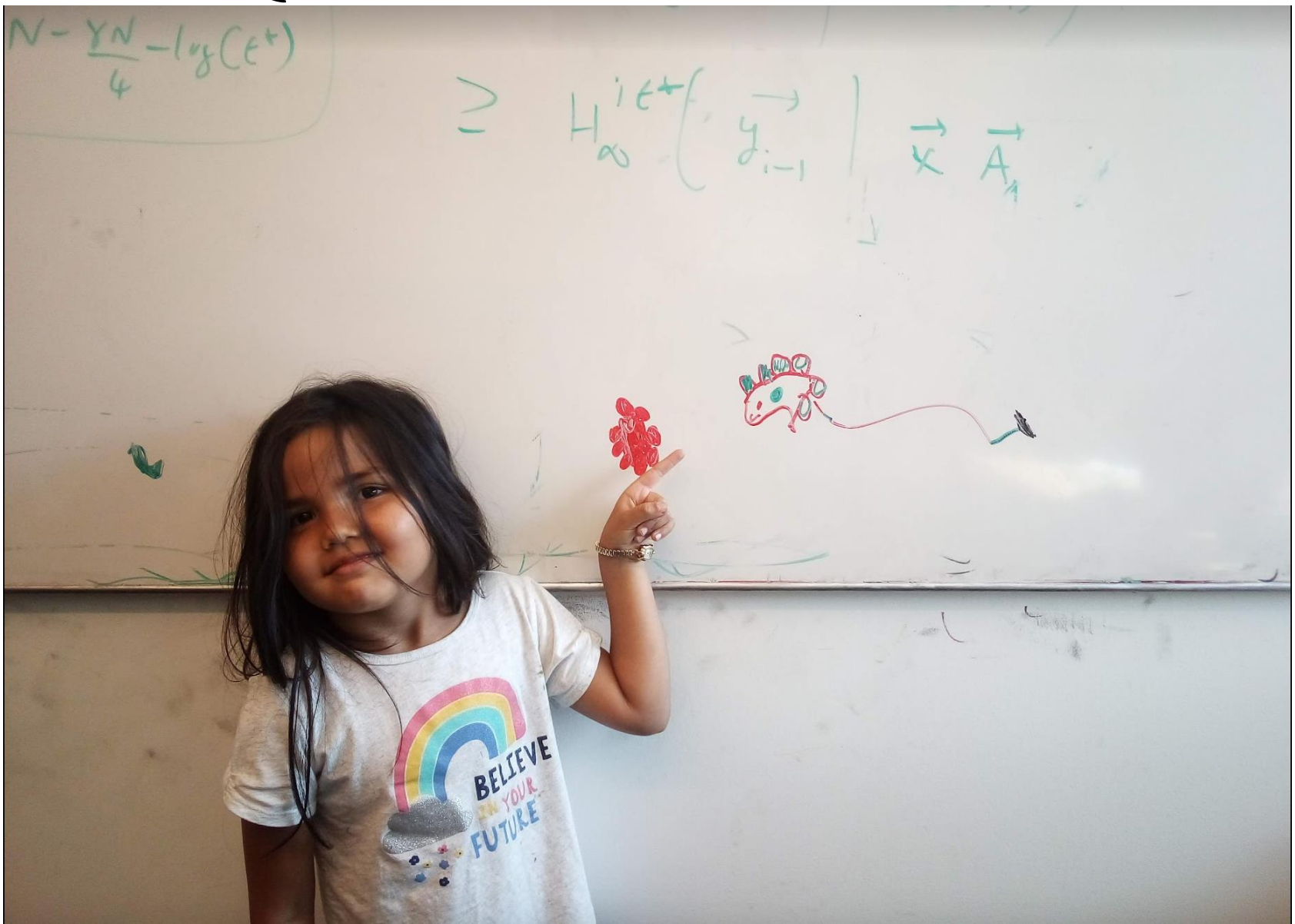
How fair was the decision that your group made in the algorithm design to favor one group of customers (those identified in the second question above) over another (those identified in the third question above? **Justify** your answer.

If some of your customers are not as well served as others, are there ways for you to address this unfairness that might result in a more ethical distribution of services?

Quiz 1 Grading

Will be done by tonight

Questions/Comments?



Interval Scheduling Problem

Input: n intervals $[s(i), f(i))$ for $1 \leq i \leq n$

Output: A *schedule* S of the n intervals

No two intervals in S conflict

$|S|$ is maximized

Analyzing the algorithm

R: set of requests

Set S to be the empty set

While R is not empty

Choose i in R with the earliest finish time

Add i to S

Remove all requests that conflict with i from R

Return S* = S

S* has no conflicts

S* is an optimal solution

Greedy "stays ahead"

Today's agenda

Prove the correctness

(If we have time) Analyze run-time of the greedy algorithm

Argue correctness on the board…