Lecture 17

CSE 331

Oct 8, 2021

Please have a face mask on

Masking requirement

UB 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

Quiz 1– 10:20-10:30am

Lecture starts at 10:35am

Quiz 1 timelines

Solutions: posted by today evening

Grading: finished by Saturday

Please do fill in the feedback

note @245

0 views

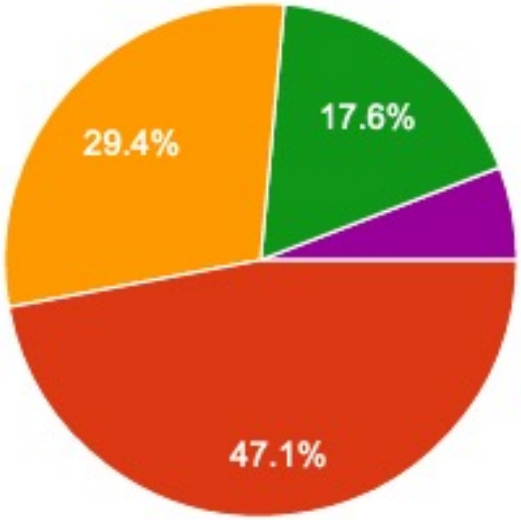
Actions

Feedback on CSE 331

Every year, I ask y'all to give feedback on CSE 331, so here is the feedback form for this year:

Overall your feeling about CSE 331

17 responses



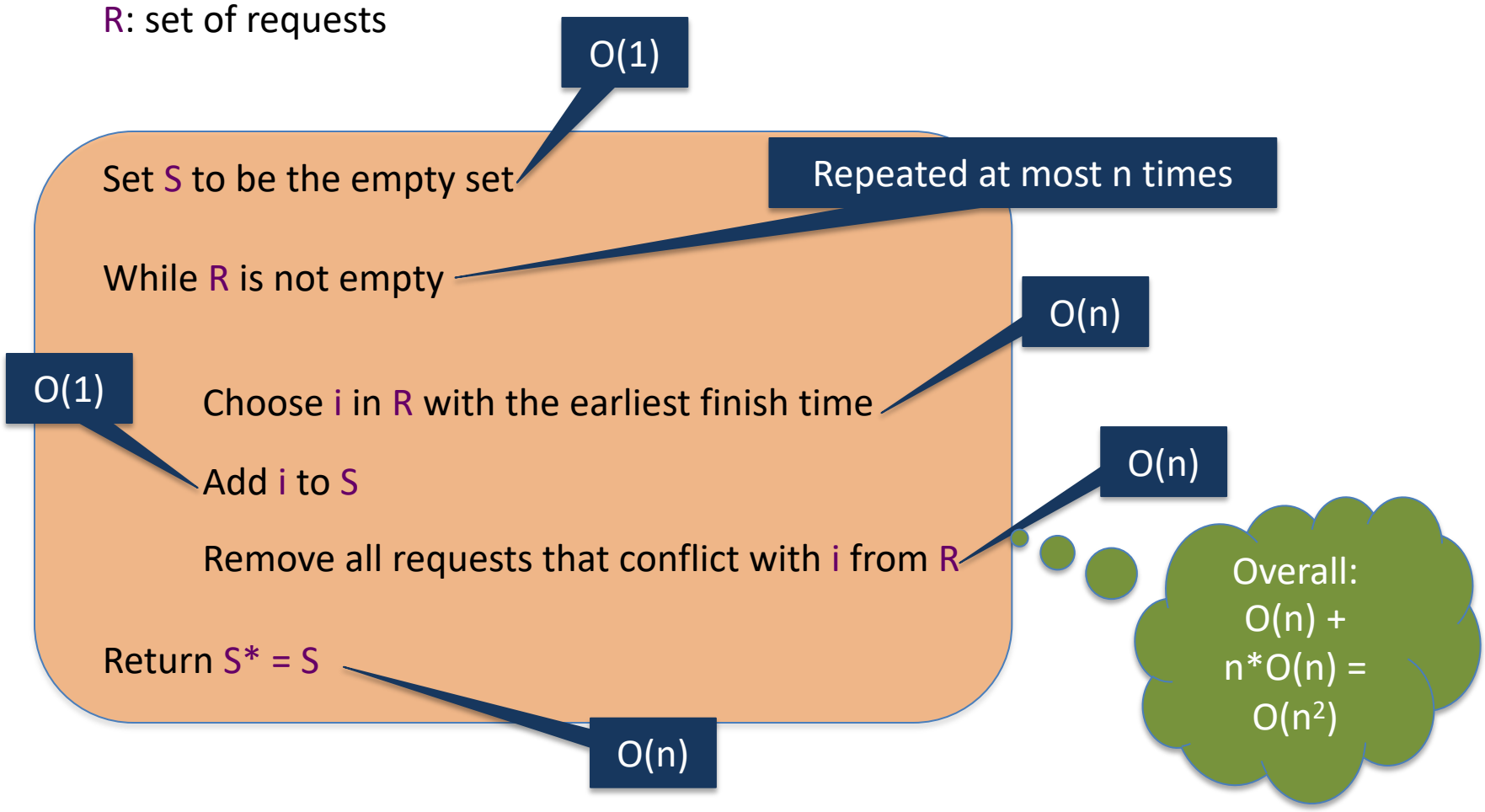
- Very Happy
- Challenged and happy
- Challenged and meh
- Challenged and unhappy
- Challenged and very unhappy
- I'm bored!

Mid-terms next week

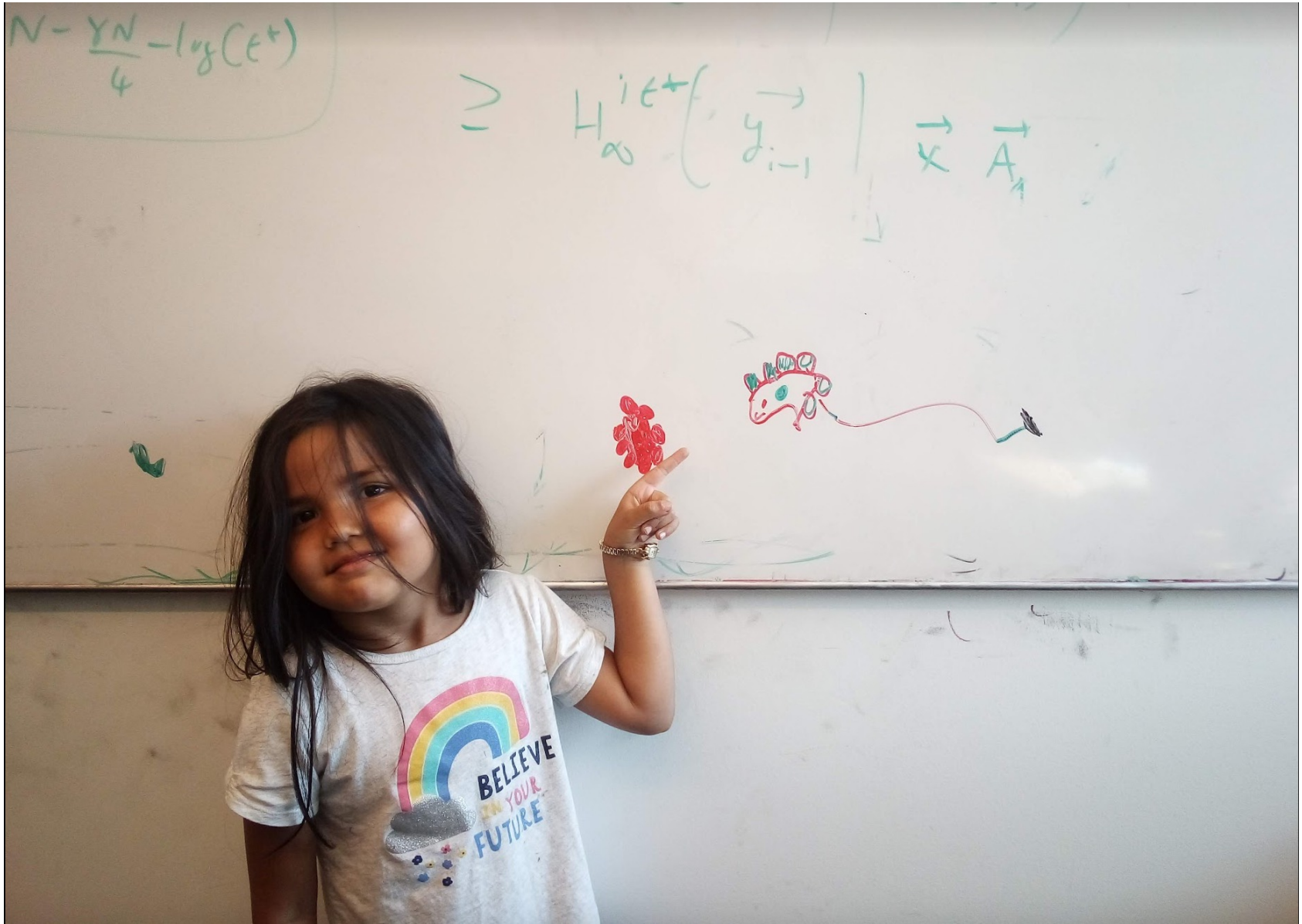
Mon, Oct 11	**Mid-term exam: I**	
Wed, Oct 13	**Mid-term exam: II**	**(HW 4 out)**

Questions?

Runtime analysis of Greedy Algo.

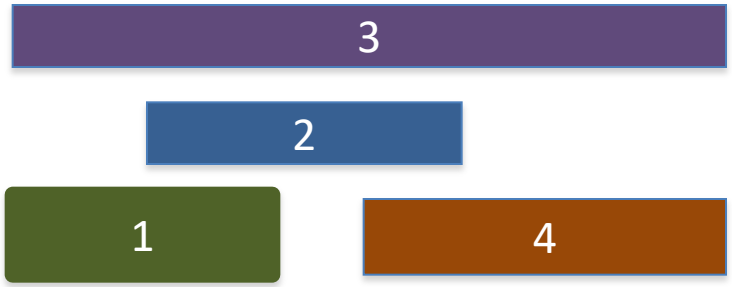


Questions/Comments?



Algorithm implementation

Go through the intervals in order of their finish time



Check if s[i] < f(1)

In general, if jth interval is the last one chosen

Pick smallest i>j such that s[i] ≥ f(j)

O(n log n) run time

The final algo

O(n log n) time sort intervals such that $f(i) \leq f(i+1)$

O(n) time build array $s[1..n]$ s.t. $s[i]$ = start time for i

Add 1 to A and set $f = f(1)$

For $i = 2 .. n$

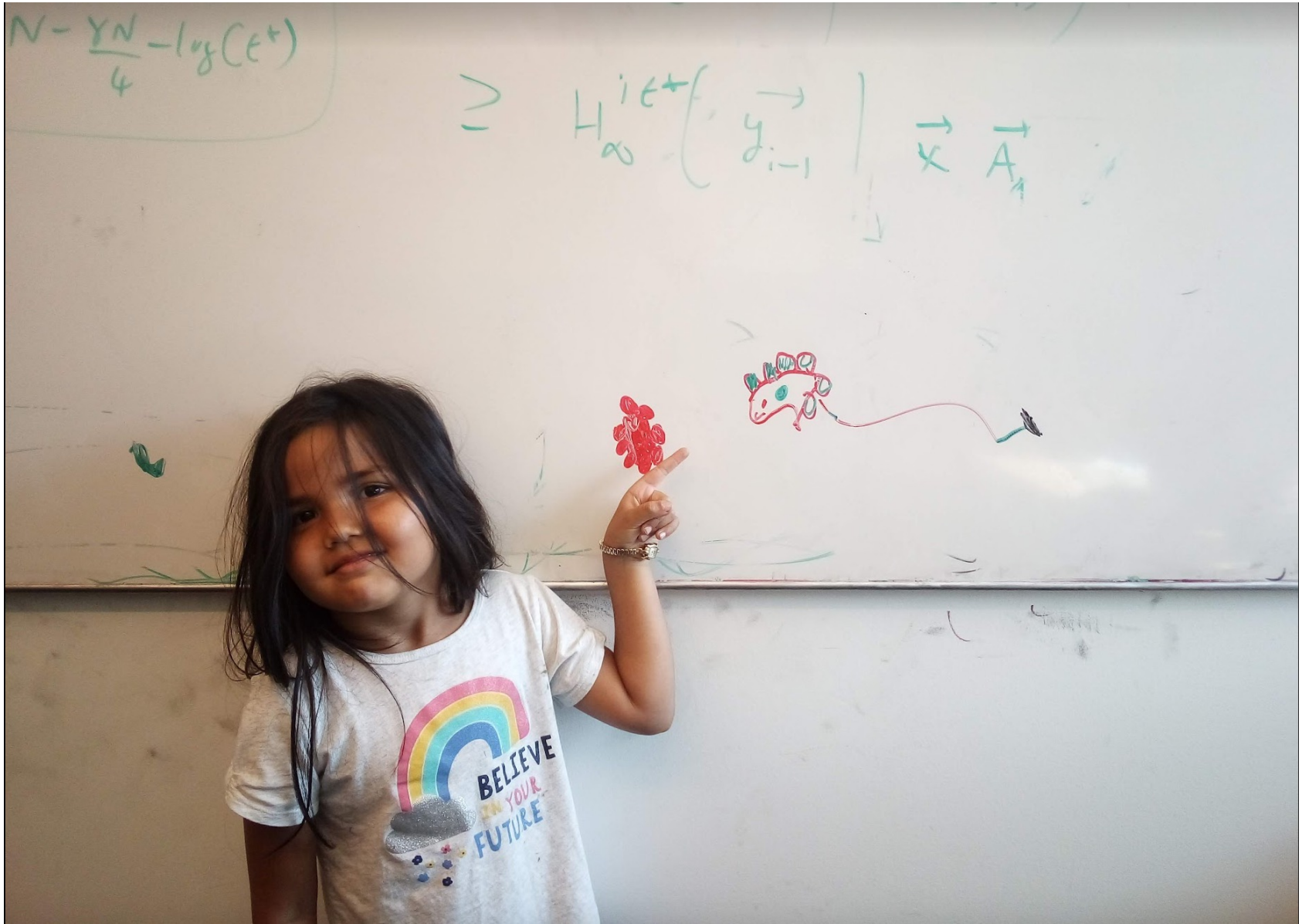
If $s[i] \geq f$

Add i to A

Set $f = f(i)$

Return $A^* = A$

Questions/Comments?

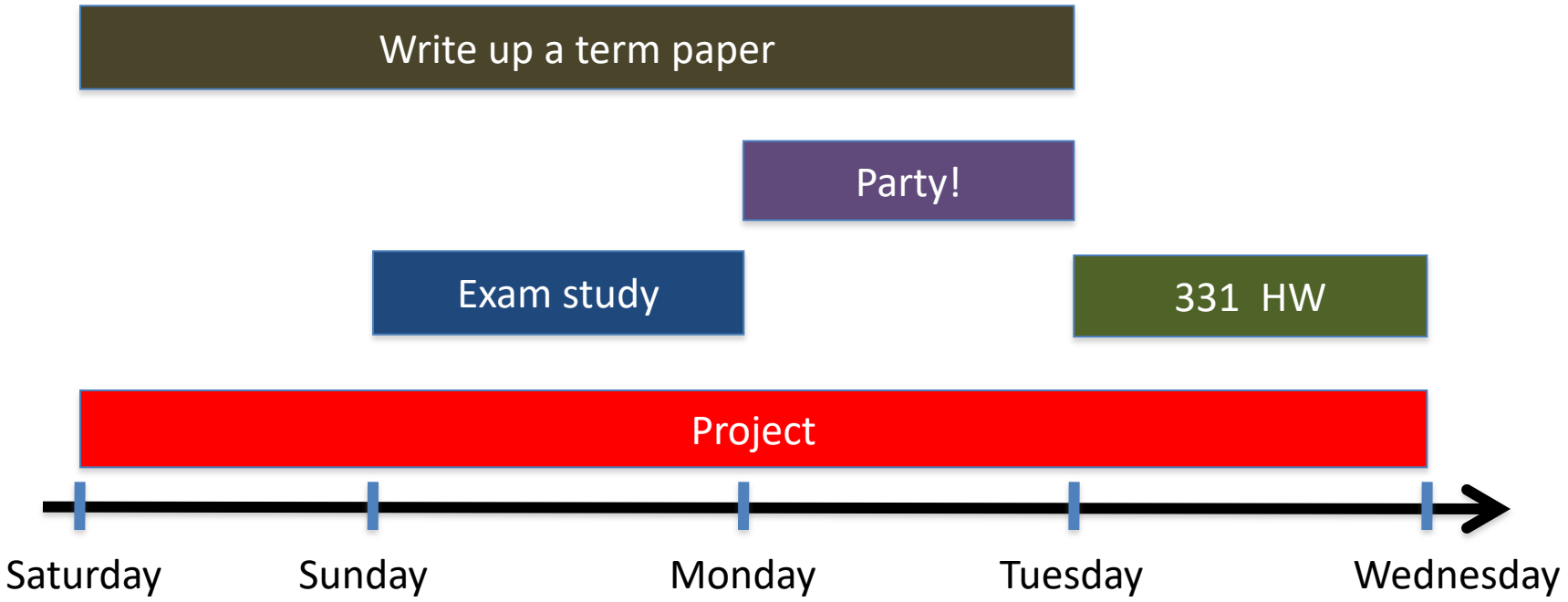


Reading Assignment

Sec 4.1 of [KT]

The “real” end of Semester blues

There are deadlines and durations of tasks



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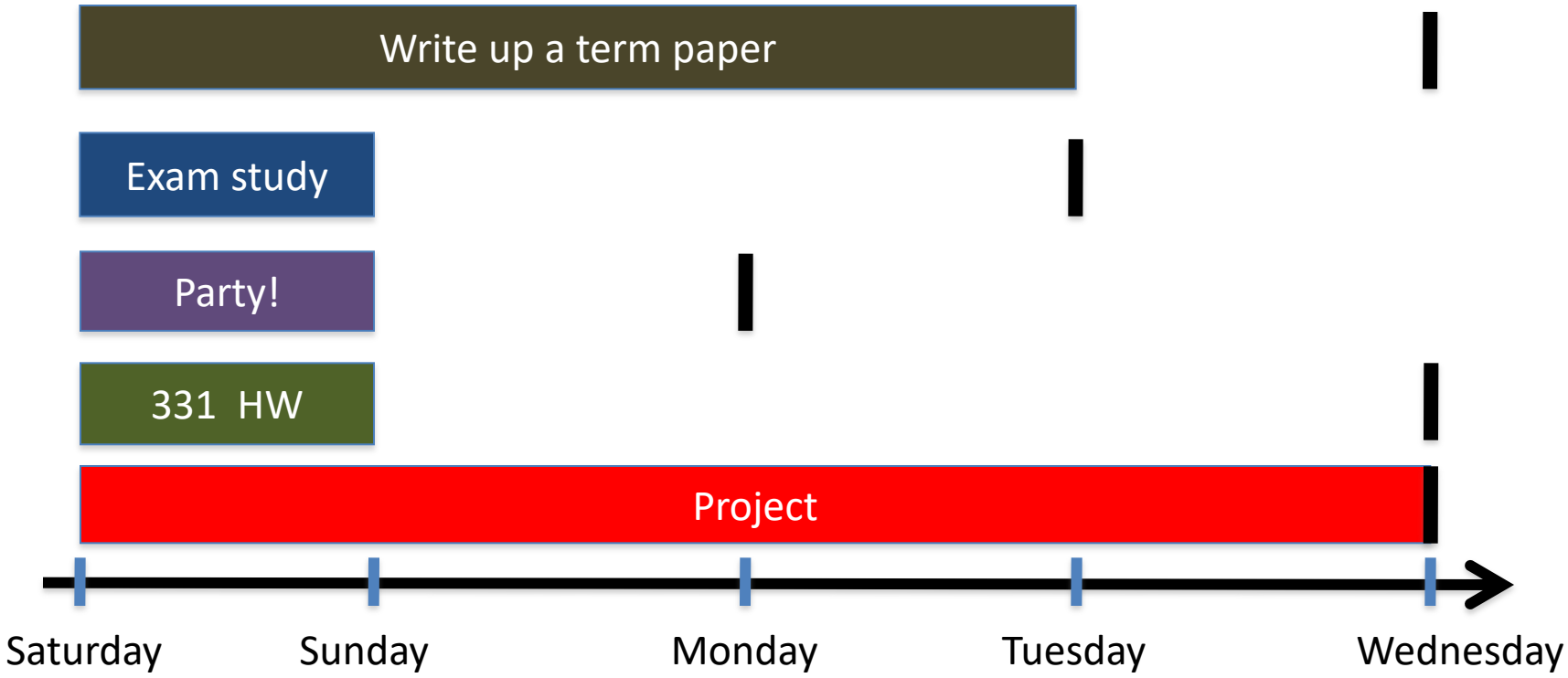


The algorithmic task

YOU decide when to start each task

Write up a term paper

Exam study

Party!

331 HW

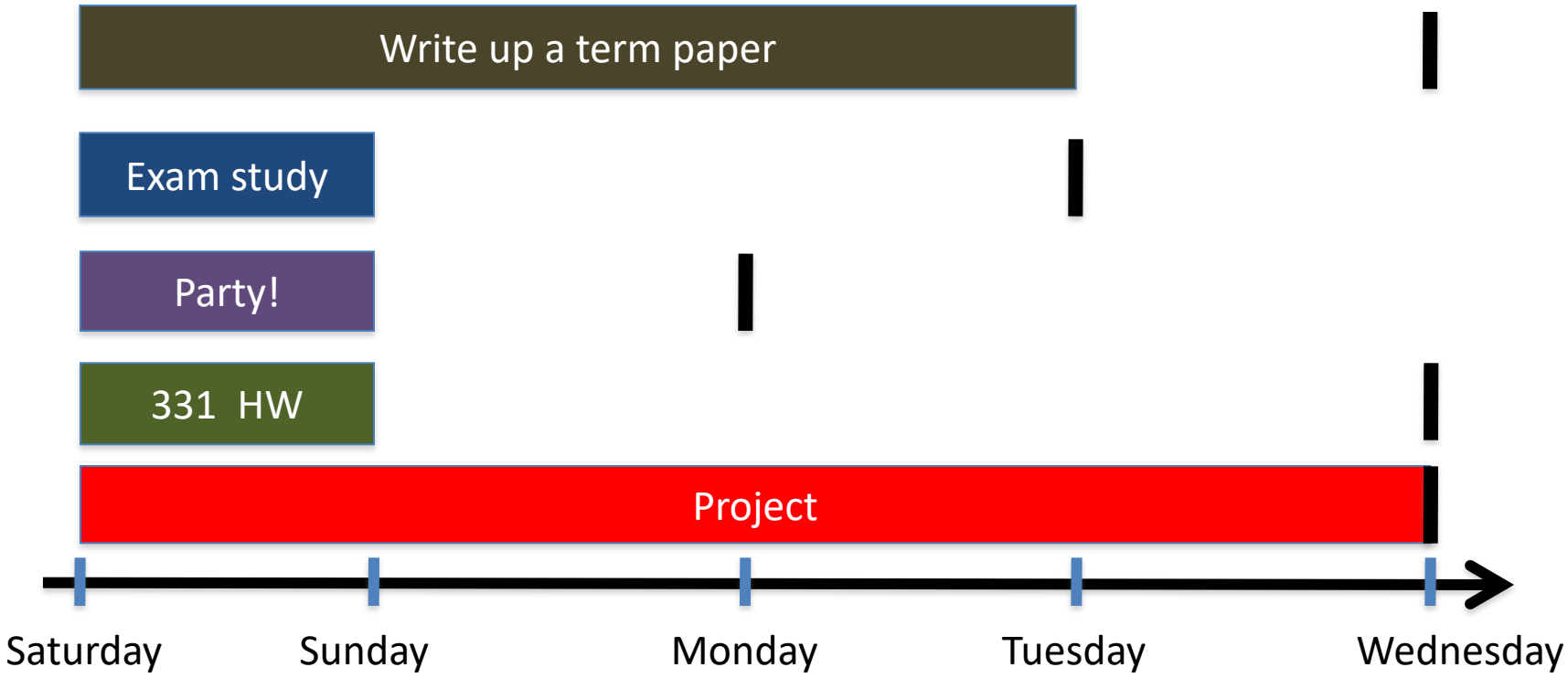
Project

You have to do ALL the tasks

Saturday Sunday Monday Tuesday Wednesday

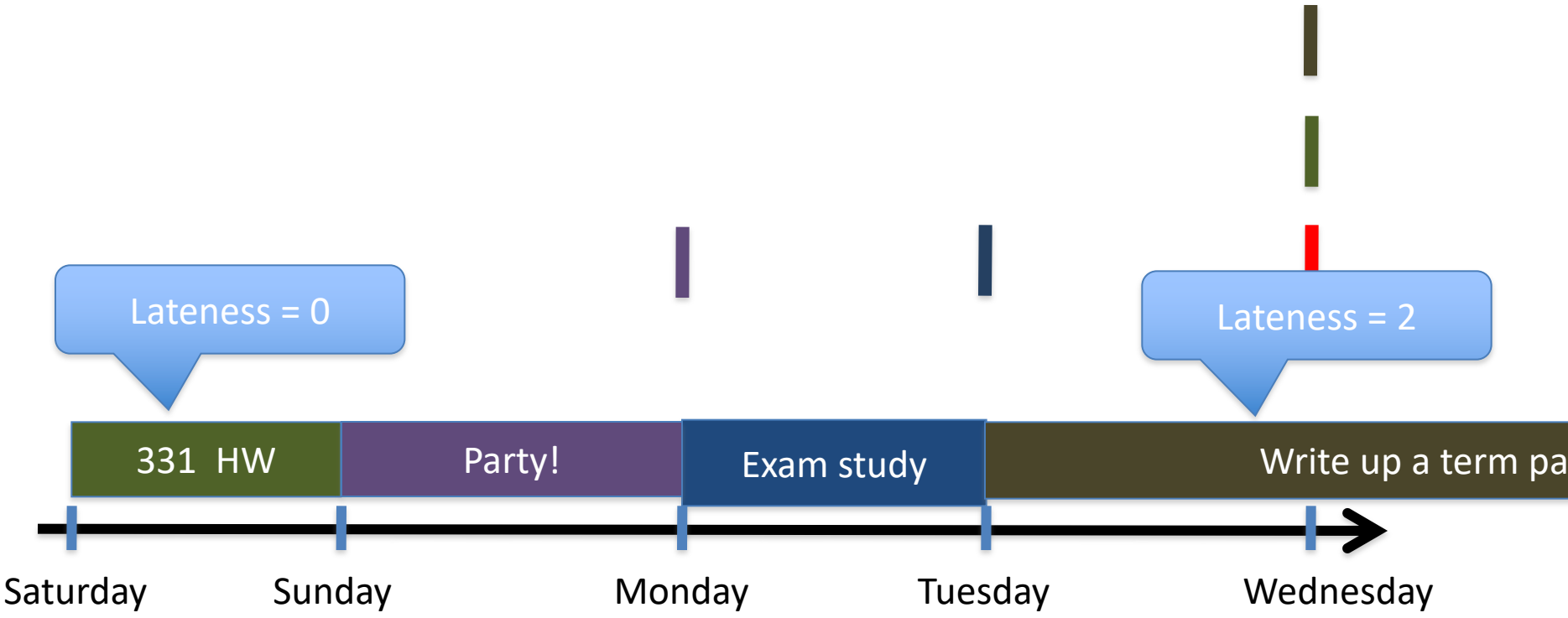
Scheduling to minimize lateness

All the tasks have to be scheduled
GOAL: minimize maximum lateness



One possible schedule

All the tasks have to be scheduled
GOAL: minimize maximum lateness



Minimizing Max Lateness

Minimizing Maximum Lateness

This page collects material from previous incarnations of CSE 331 on scheduling to minimize maximum lateness.

Where does the textbook talk about this?

`Section 4.2` in the textbook has the lowdown on the problem of scheduling to minimize maximum lateness.

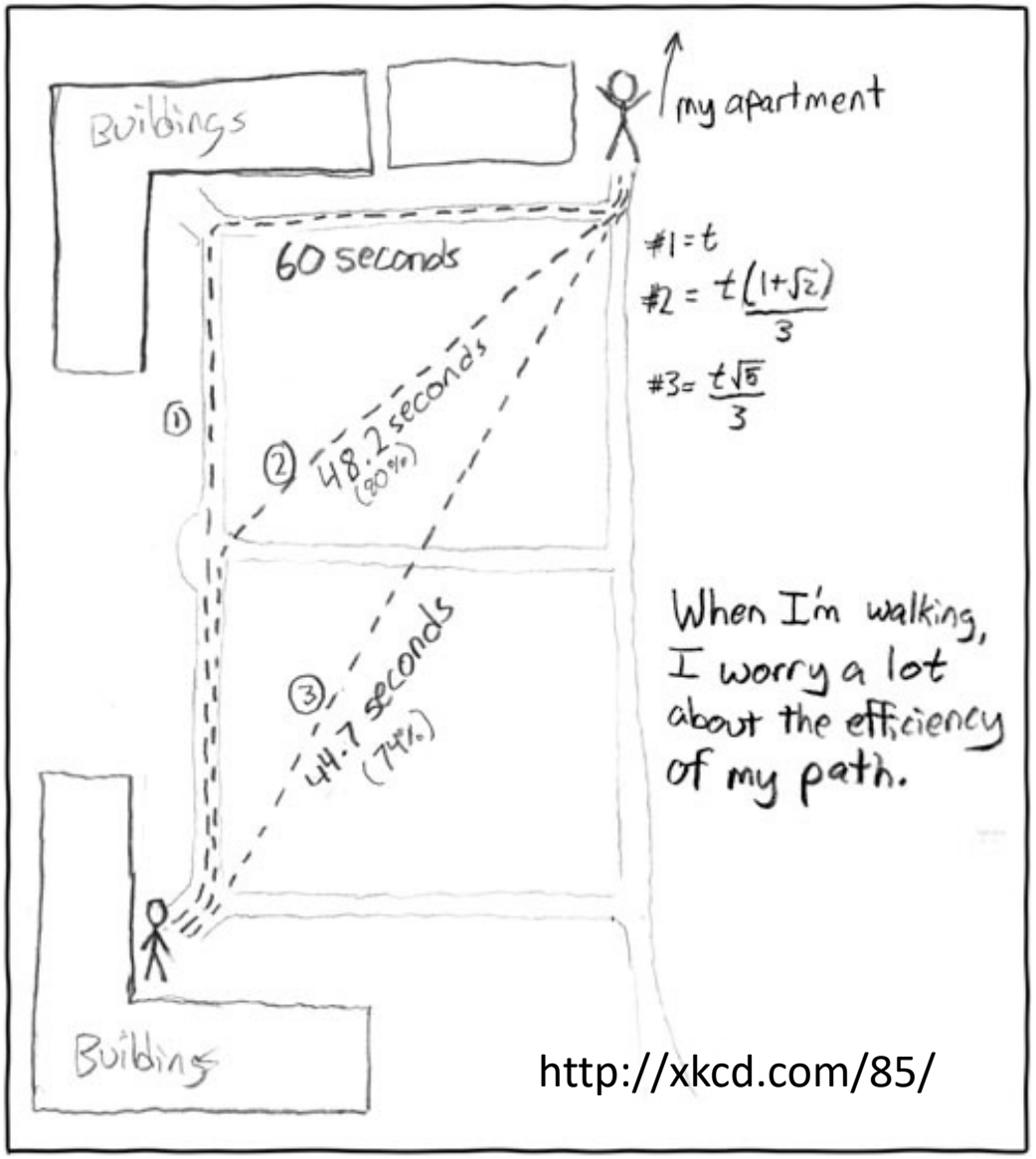
Fall 2018 material

First lecture

Here is the lecture video:

Rest of today

Shortest Path Problem



Reading Assignment

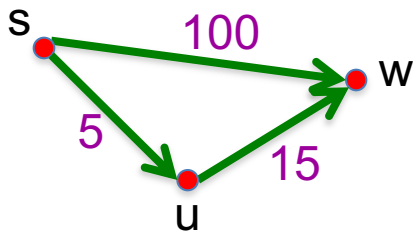
Sec 2.5 of [KT]

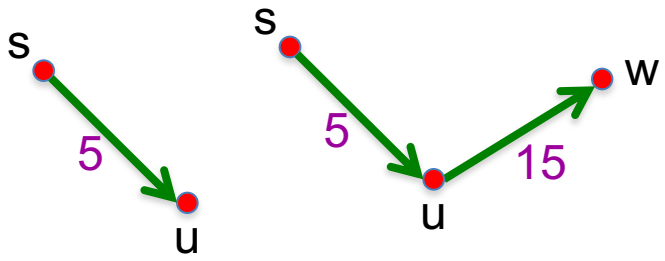
Shortest Path problem

Input: *Directed* graph G=(V,E)

Edge lengths, l_e for e in E

"start" vertex s in V





Output: All shortest paths from s to all nodes in V

Naïve Algorithm

$\Omega(n!)$ time

Dijkstra's shortest path algorithm