# Lecture 17

CSE 331

Oct 7, 2022

# Quiz 1– 11:00-11:10am

# Lecture starts at 11:15am

# Quiz 1 timelines

Solutions: posted by today evening

Grading: finished by Saturday

# Please do fill in the feedback

note 6021

stop following 1 view

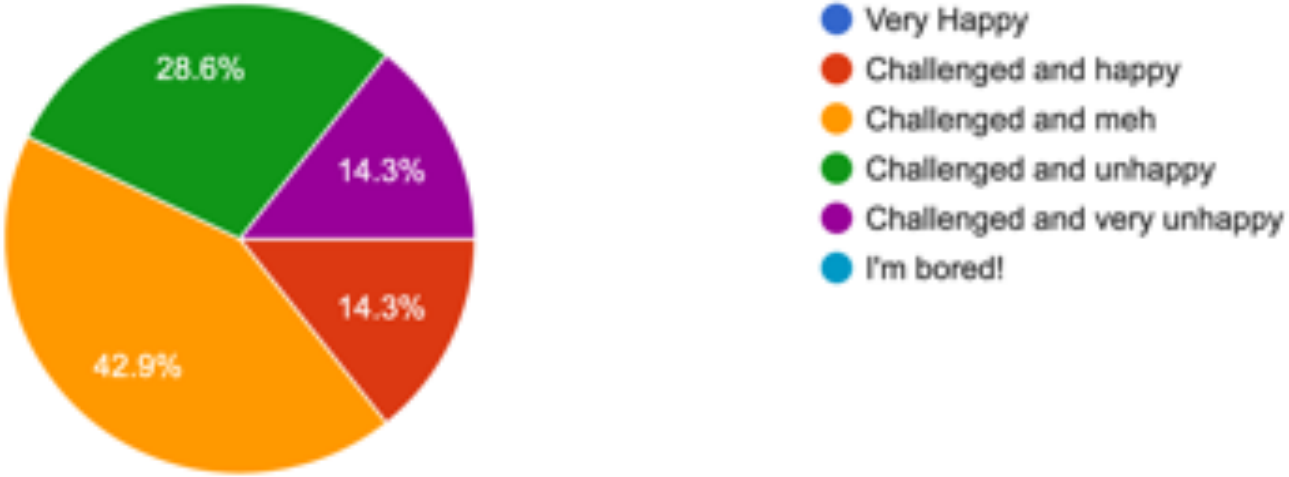
Actions

## 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

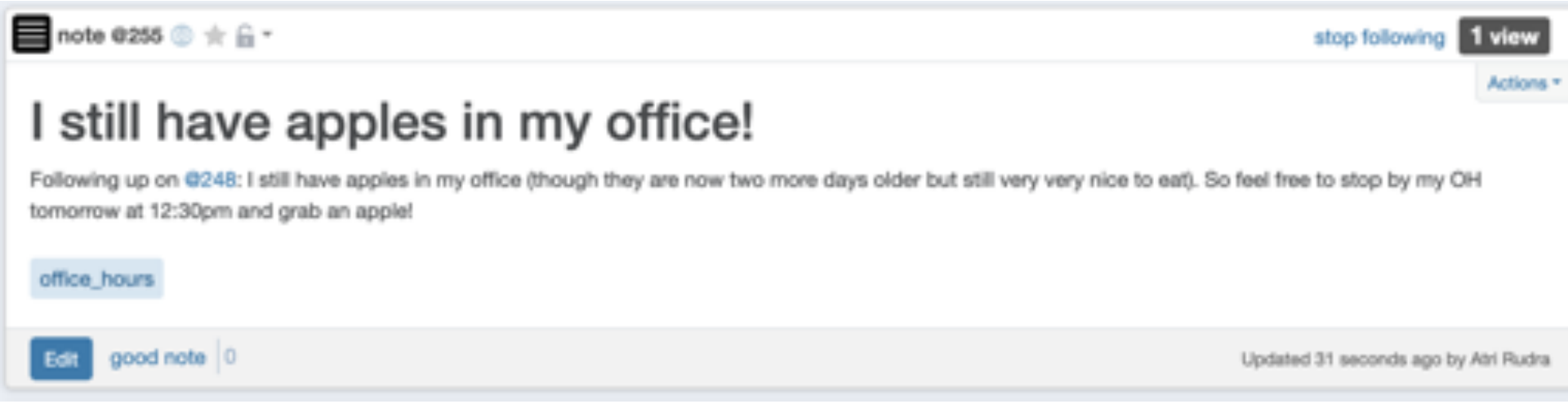
7 responses



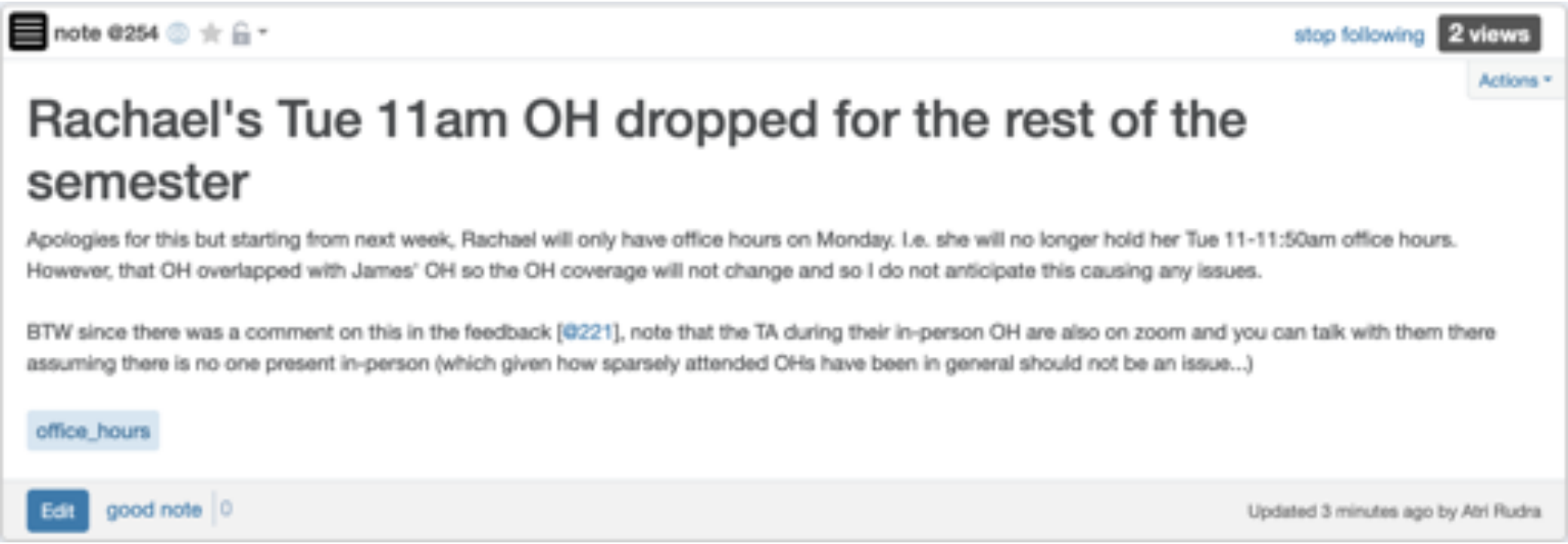
# Mid-terms next week

| | | |
|---|---|---|
| Mon, Oct 10 | **Mid-term exam: I** | |
| Tue, Oct 11 | | **(HW 4 out)** |
| Wed, Oct 12 | **Mid-term exam: II** | |

# I still have more apples ☺

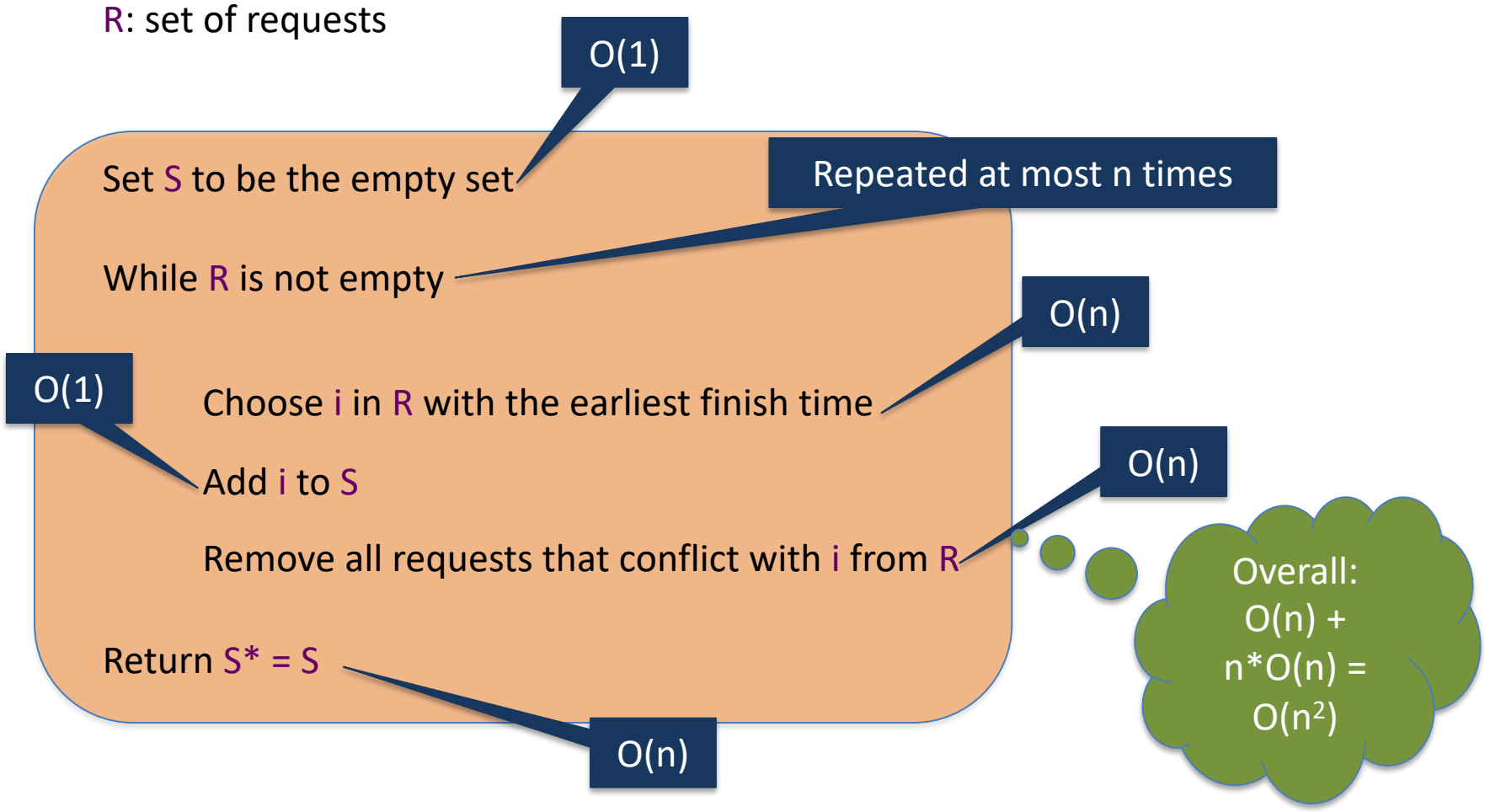


# Rachael OH only on Mondays

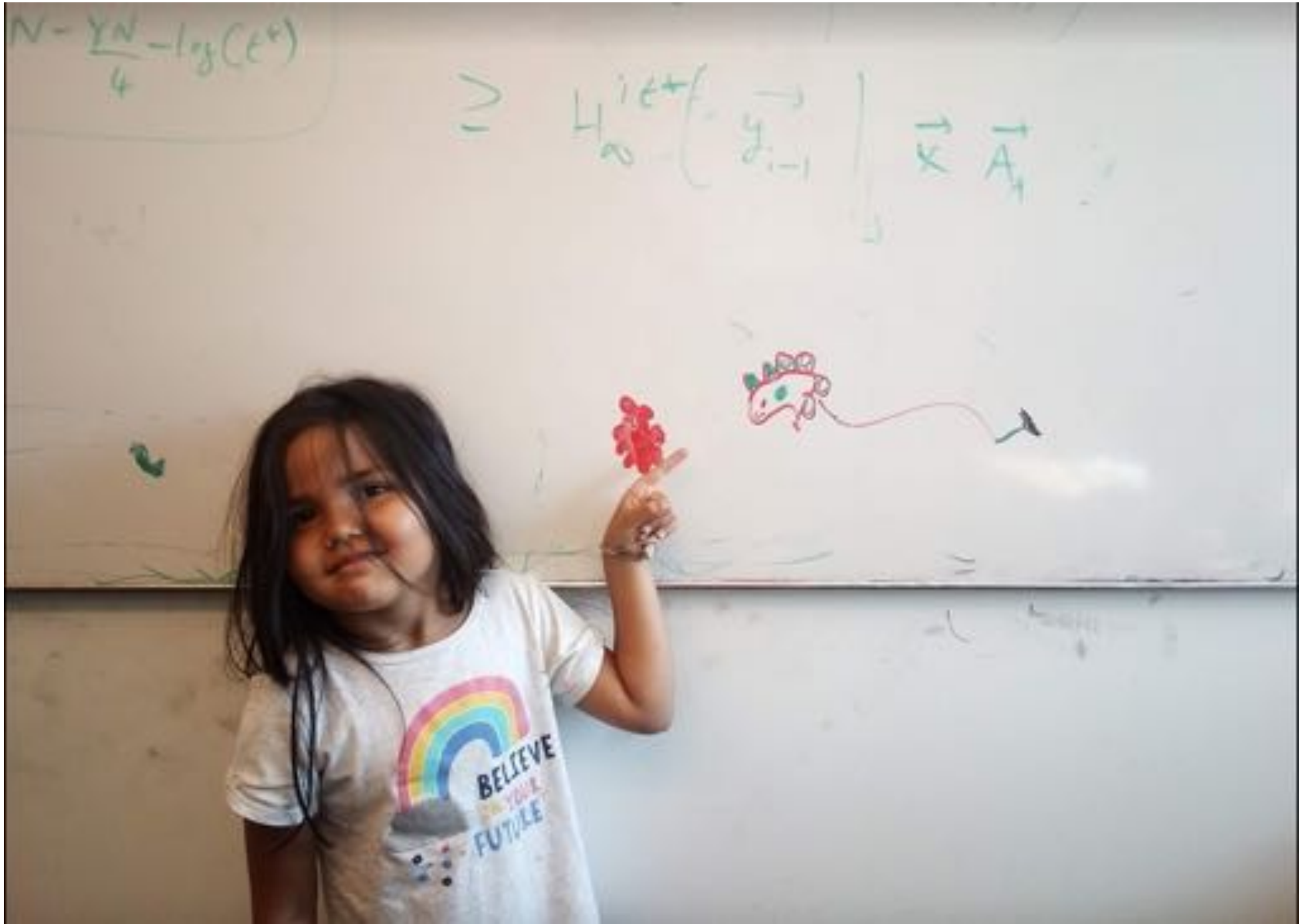


# Questions?

# Runtime analysis of Greedy Algo.

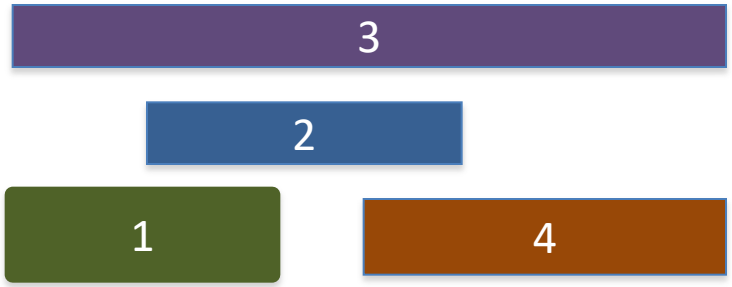


# Questions/Comments?



# 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 $i = 2 .. n$

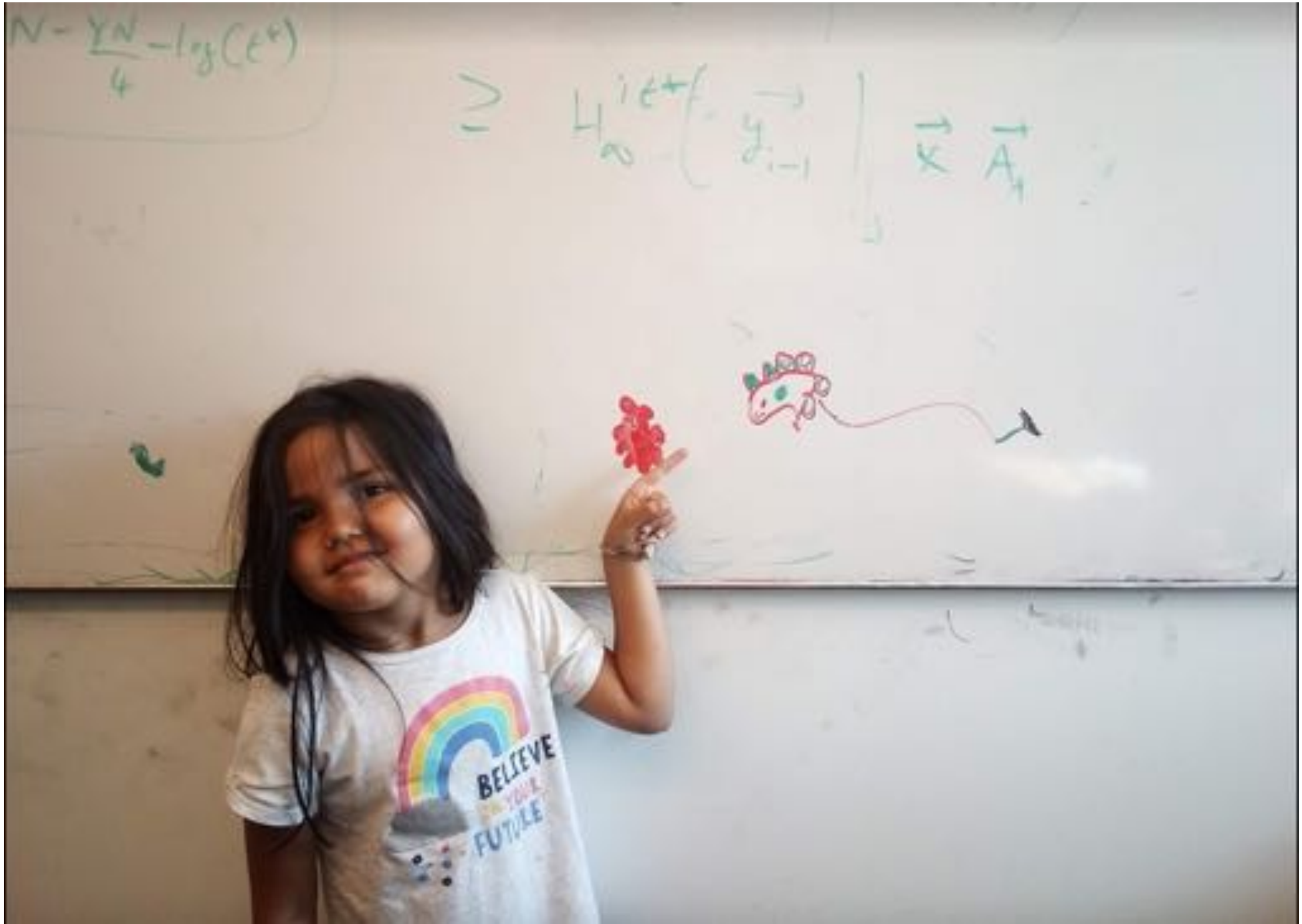
If $s[i] \geq f$

Add $i$ to A

Set $f = f(i)$

Return $A^* = A$

# Questions/Comments?

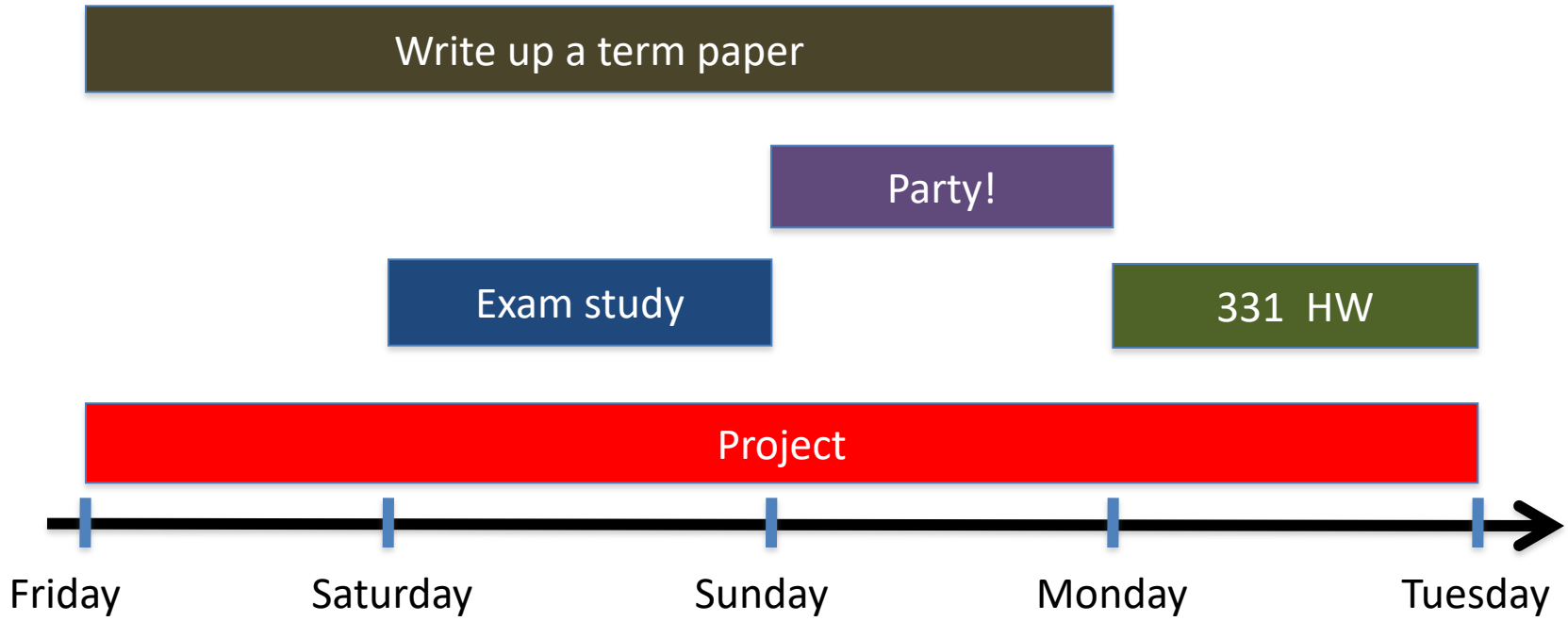


# Reading Assignment

Sec 4.1 of [KT]

# The “real” end of Semester blues

There are deadlines and durations of tasks



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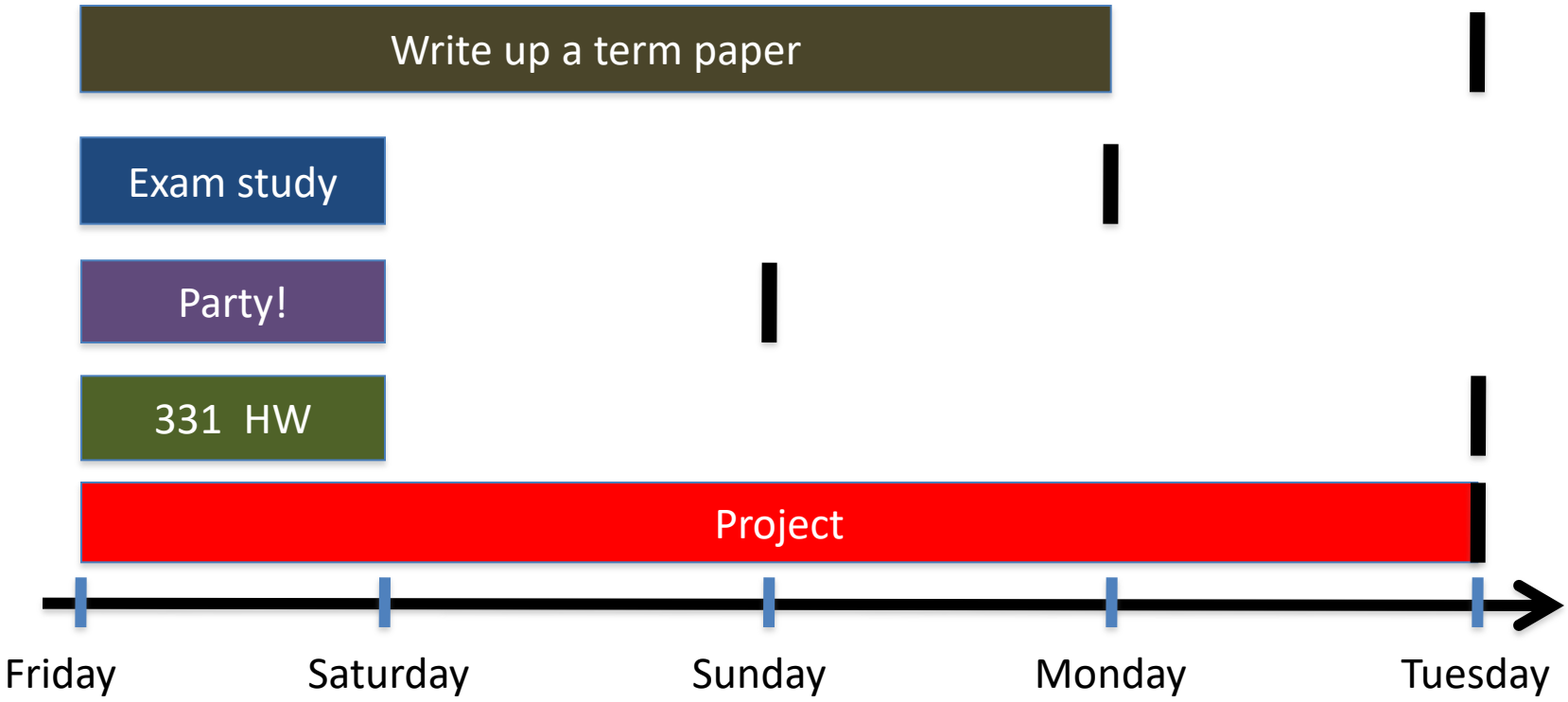


# The algorithmic task

YOU decide when to start each task

Write up a term paper

Exam study

Party!

331 HW

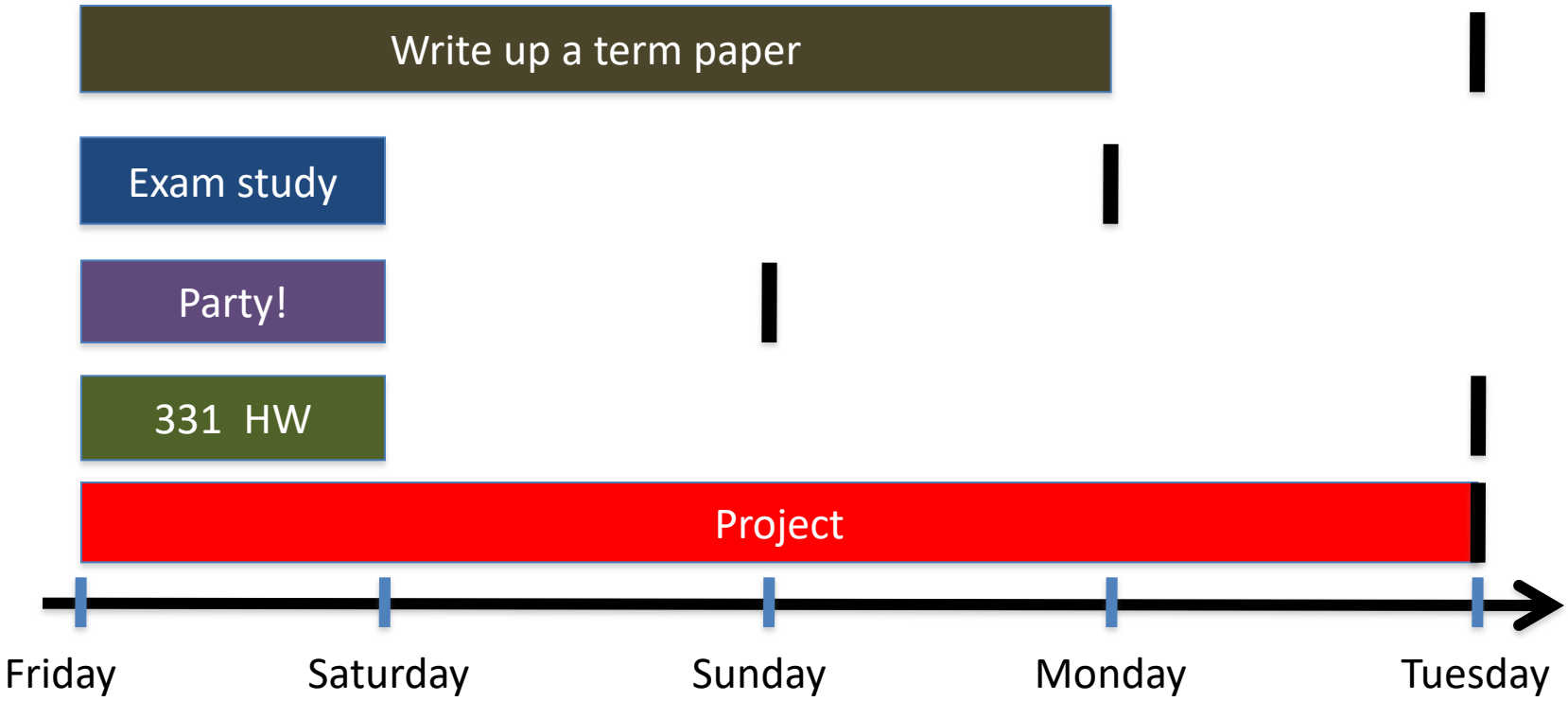
Project

You have to do ALL the tasks

Friday Saturday Sunday Monday Tuesday

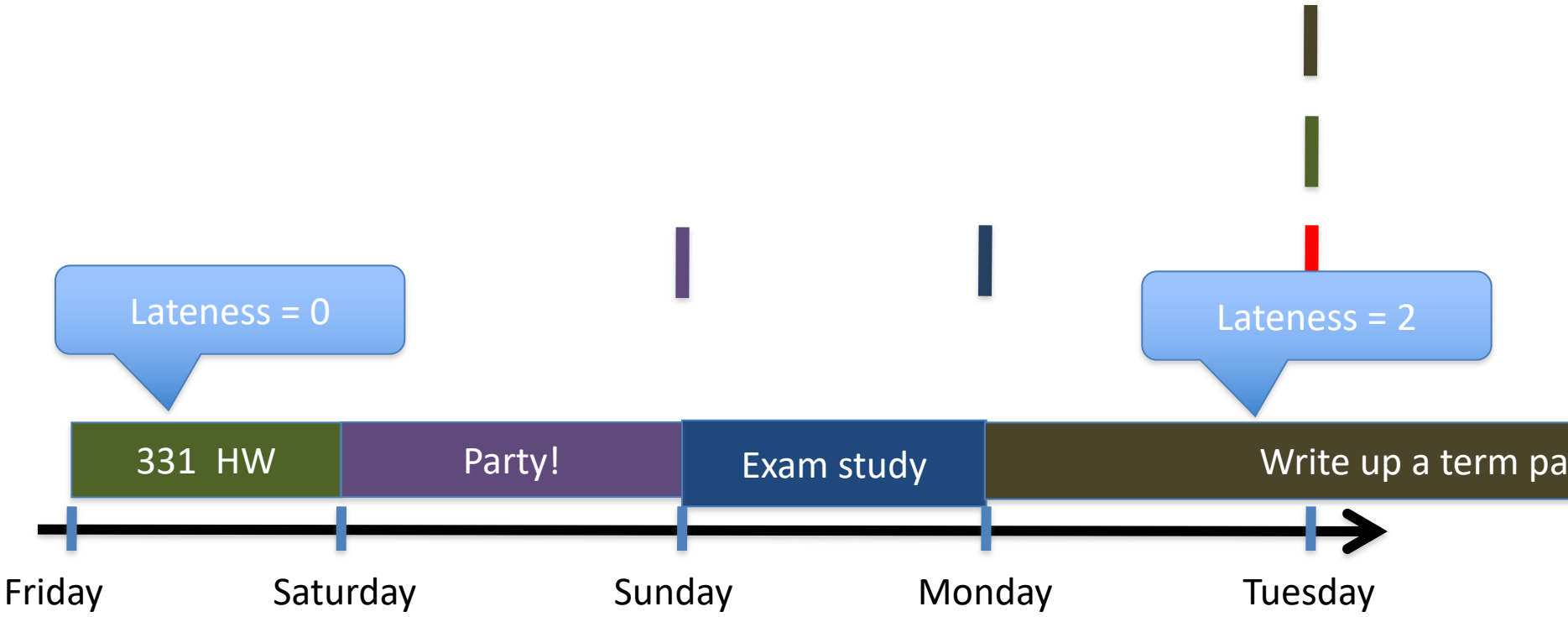
# Scheduling to minimize lateness

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.

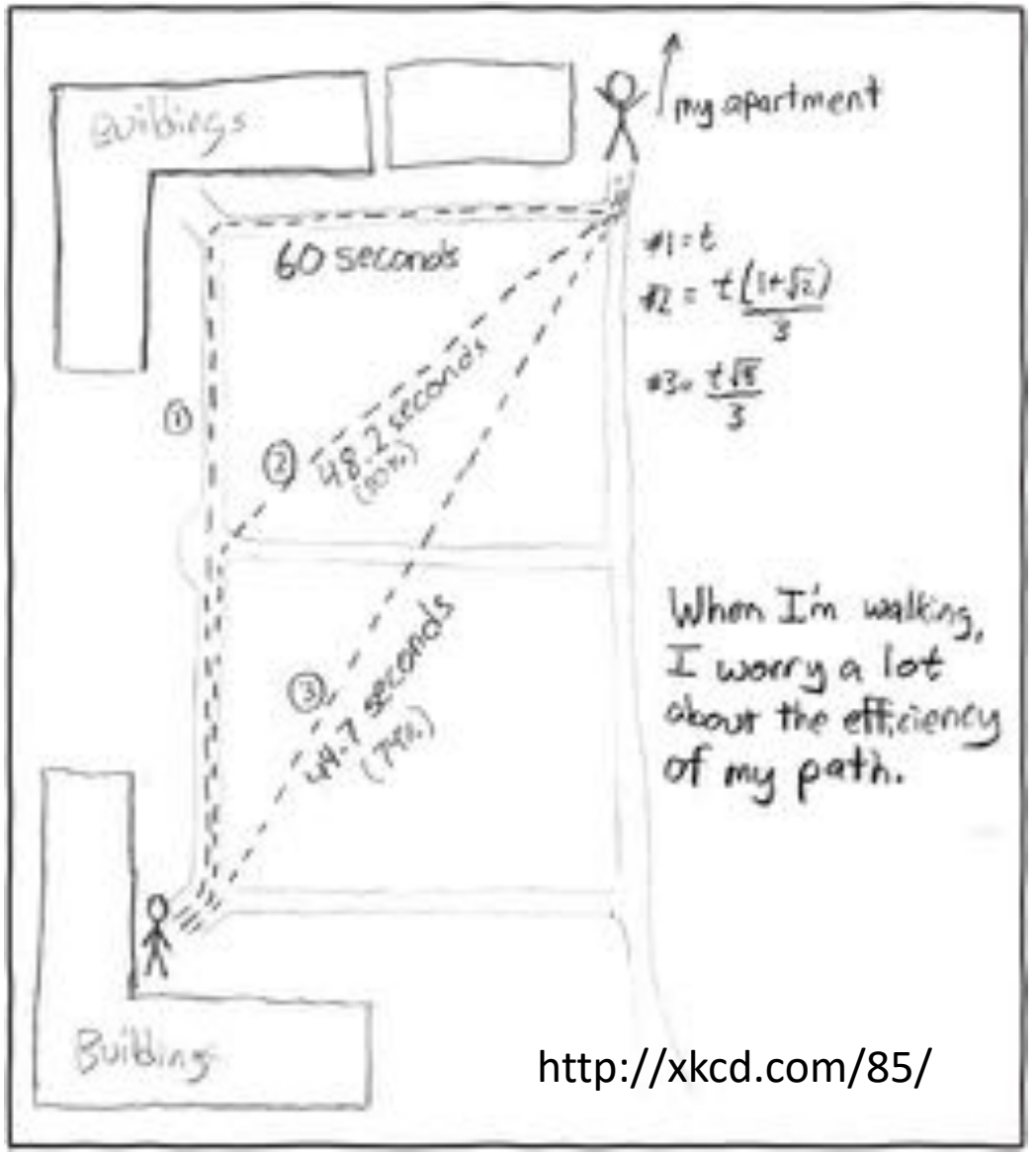
### Fall 2018 material

#### First lecture

Here is the lecture video:

# Rest of today

Shortest Path Problem



# Reading Assignment

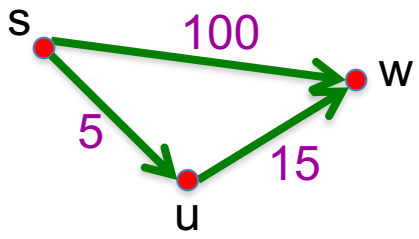
Sec 2.5 of [KT]

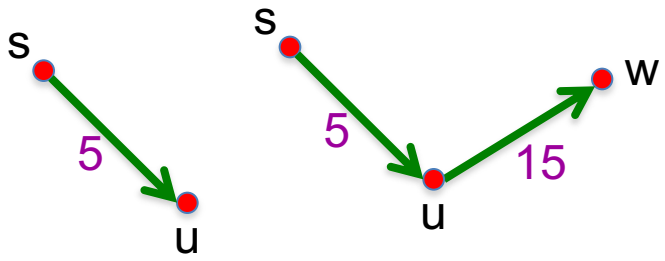
# Shortest Path problem

**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