Lecture 17

CSE 331

Mar 4, 2020

Quiz 1 on Friday

note @290

Quiz 1 on Friday, Mar 6

The first quiz will be from **2:00-2:10 pm in class** on **Friday, March 6**. We will have a 5 mins break after the quiz and the lecture will start at 2:15pm.

We will hand out the quiz paper at 1:55pm but you will **NOT** be allowed to open the quiz to see the actual questions till 2pm. However, you can use those 5 minutes to go over the instructions and get yourself in the zone.

There will be two T/F with justification questions (like those in the sample midterm 1: @233.) Also, quiz 1 will cover all topics we cover in class till Wednesday, March 4.

Also, like the mid-term, y'all can bring in one letter-sized cheat-sheet (you can use both sides).

#pin

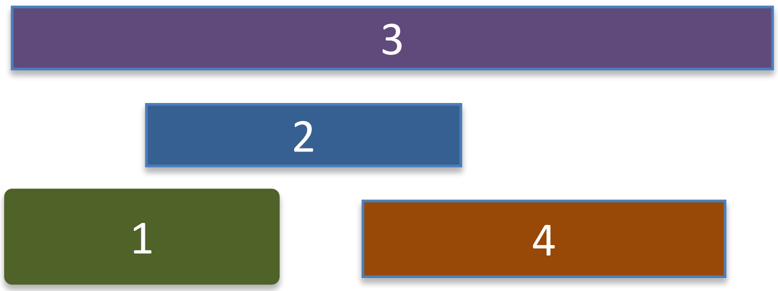
quiz

Today's agenda

Analyze run-time of the greedy algorithm

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 $s[i] \geq f(j)$

$O(n \log n)$ run time

The final algo

O(n log n) time sort intervals such that f(i) ≤ f(i+1)

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

Add 1 to S and set f = f(1)

For i = 2 .. n

If s[i] ≥ f

Add i to S

Set f = f(i)

Return S* = S

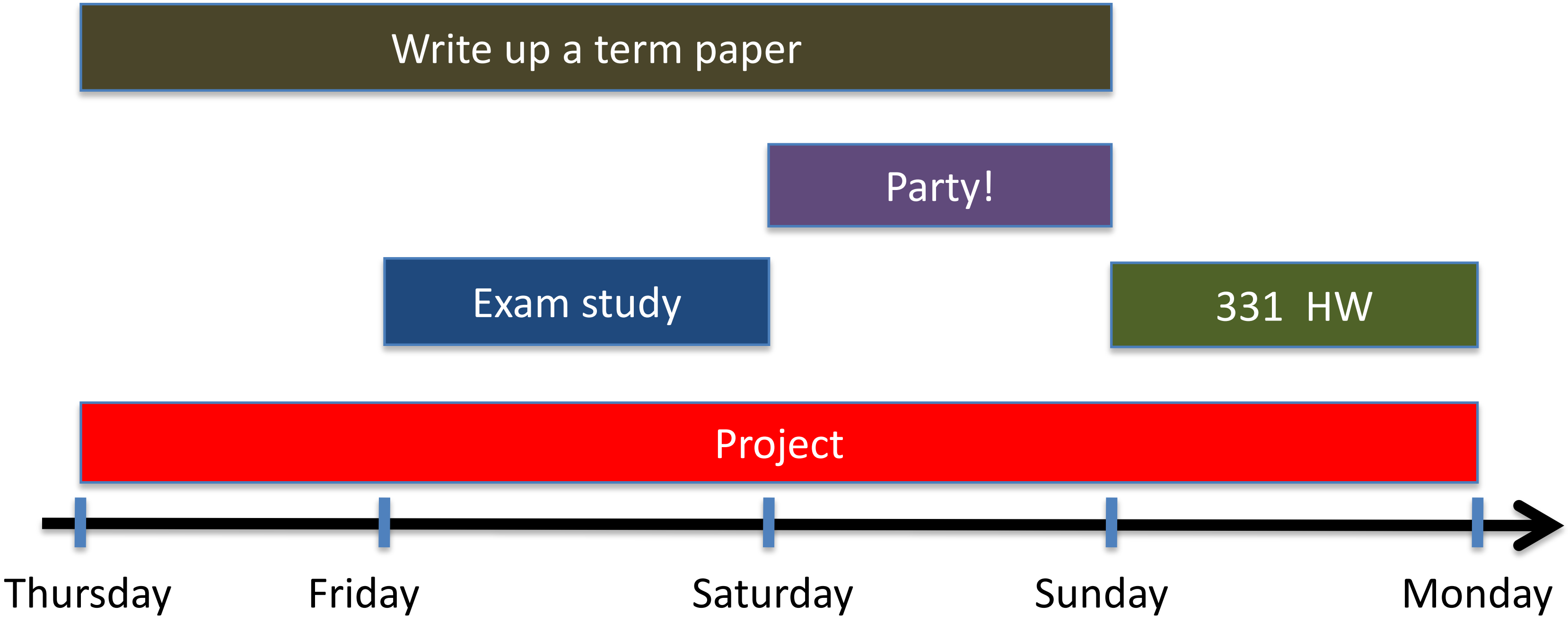
Reading Assignment

Sec 4.1of [KT]

Questions?

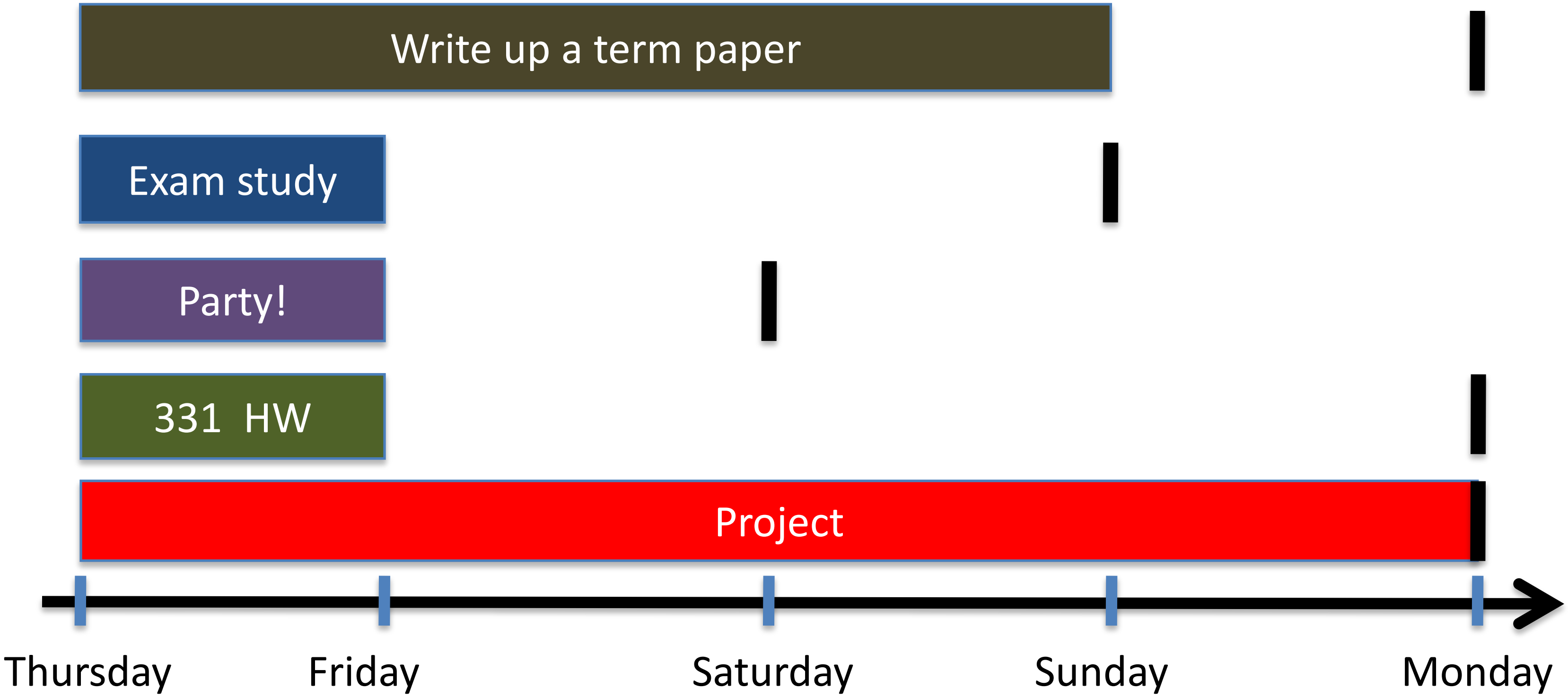
The “real” end of Semester blues

There are deadlines and durations of tasks



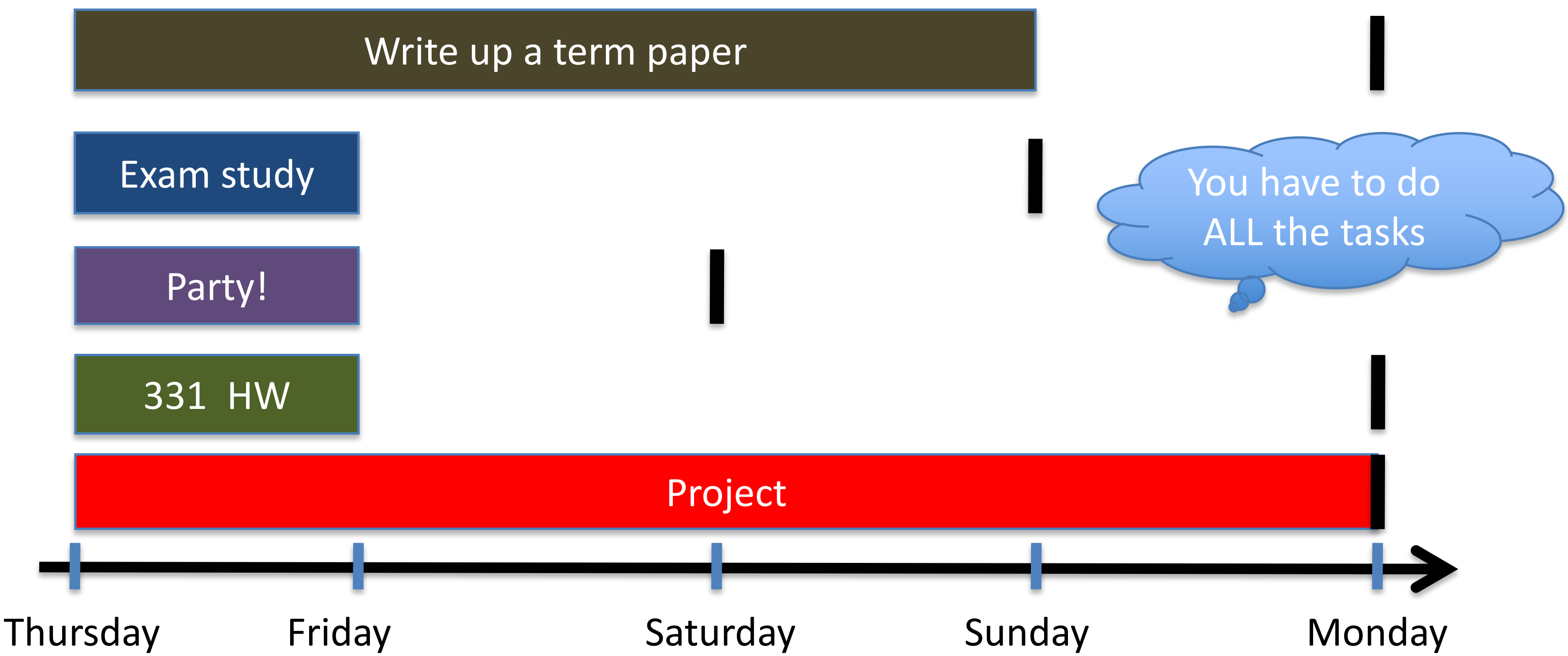
The "real" end of Semester blues

There are deadlines and durations of tasks



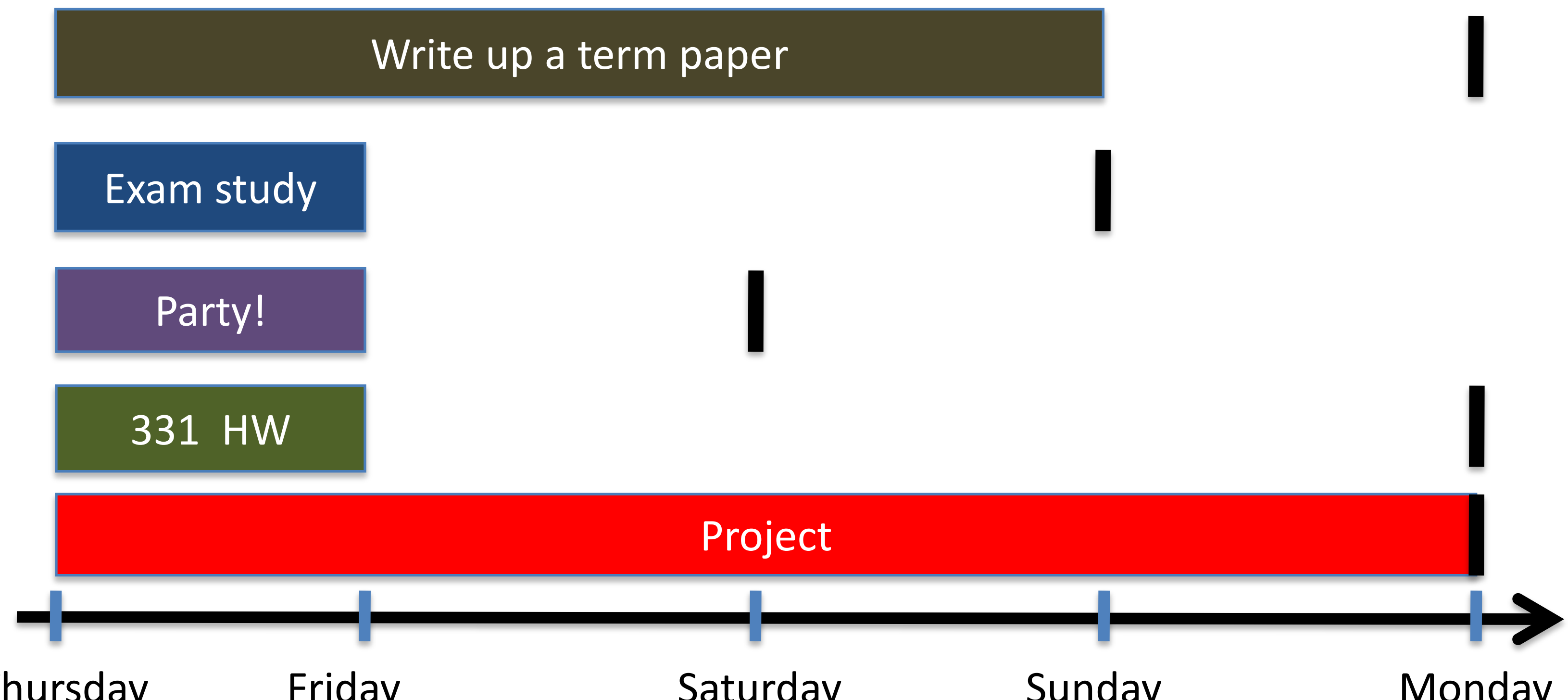
The algorithmic task

YOU decide when to start each task



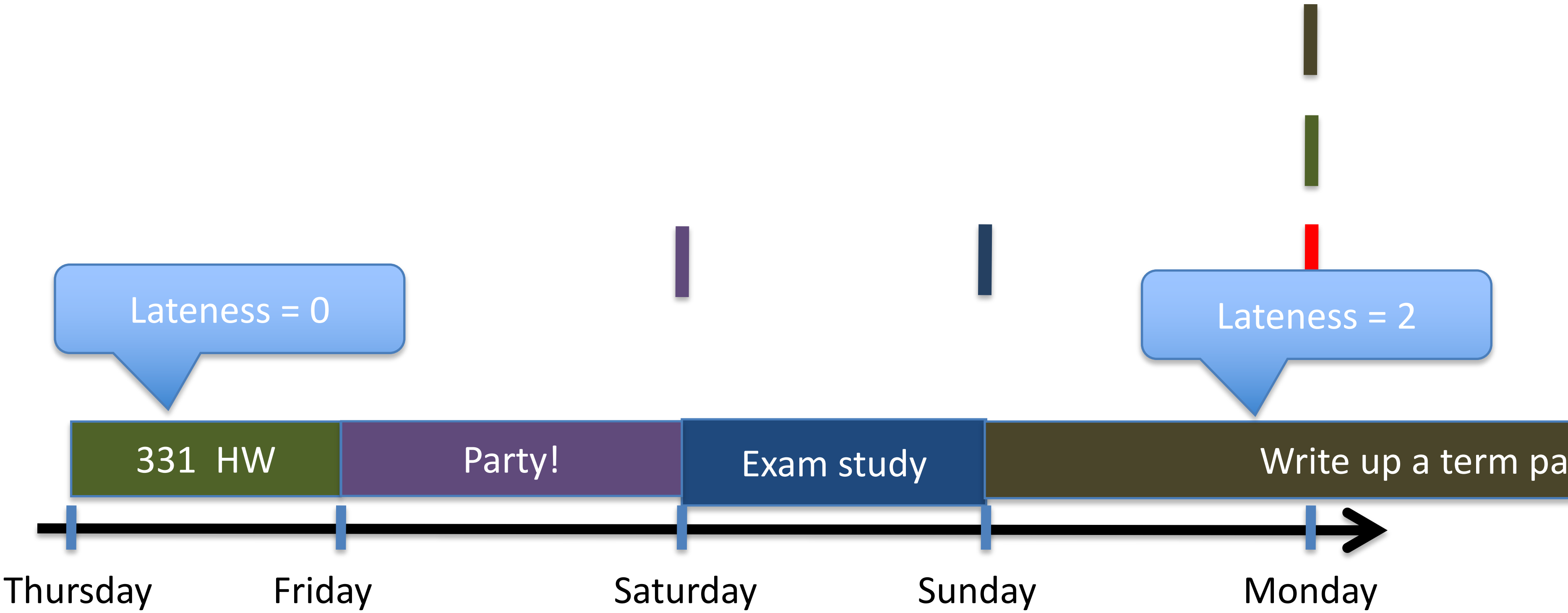
Scheduling to minimize lateness

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.

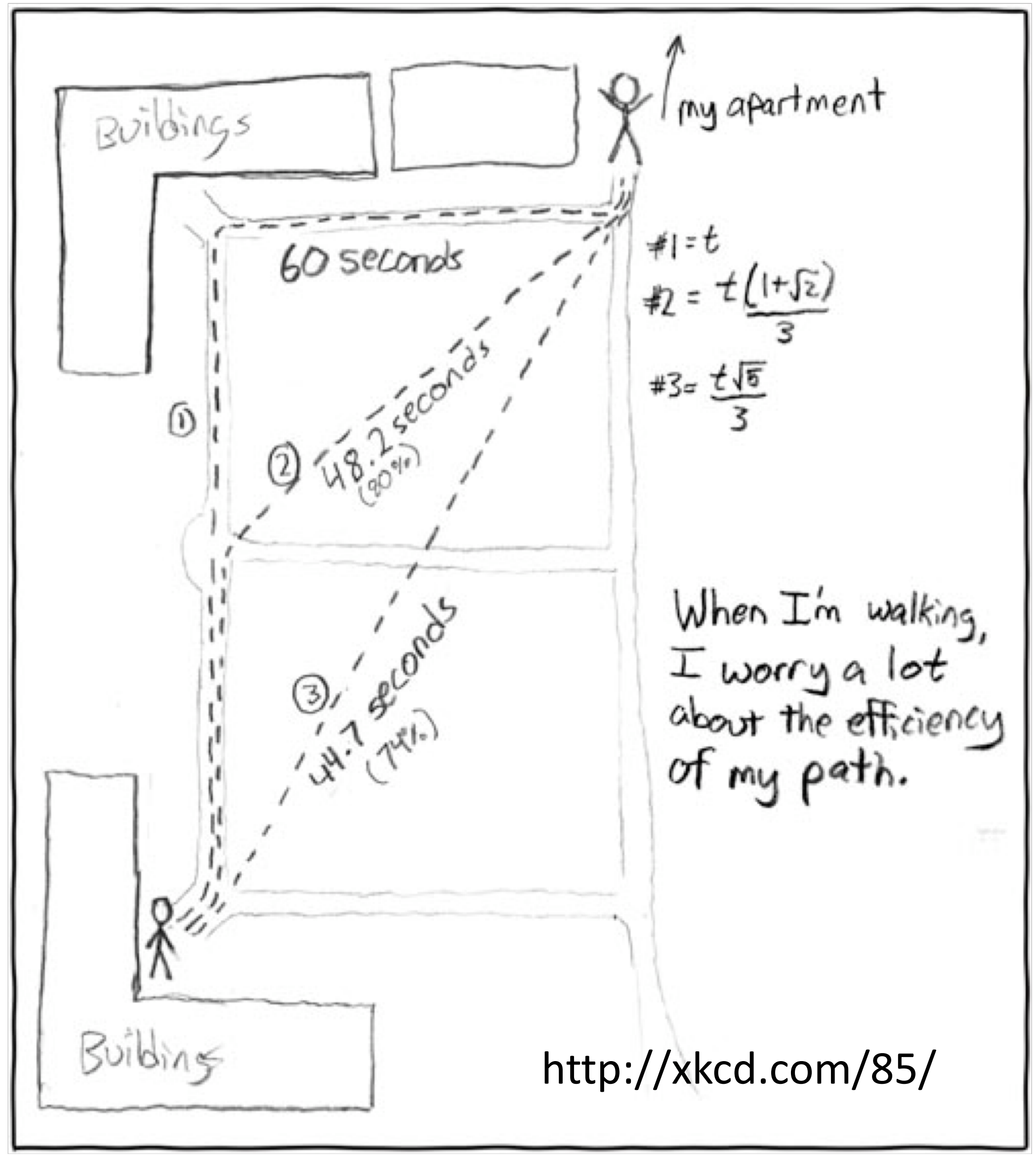
Fall 2018 material

First lecture

Here is the lecture video:

Today

Shortest Path Problem



http://xkcd.com/85/

Reading Assignment

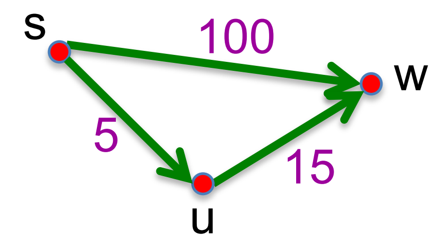
Sec 2.5 of [KT]

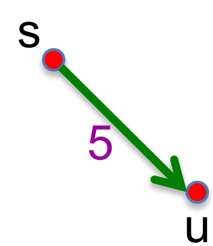
Shortest Path problem

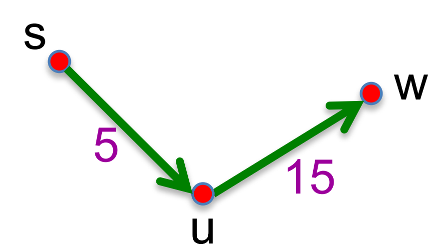
Input: *Directed* graph G=(V,E)

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