Lecture 23

CSE 331

Oct 26, 2018

Graded mid-term-I

Grades for mid-term-I released on Autolab

mid-term 2 by tonight

Response to mid-term feedback

note ☆ stop following 99 views

Response to mid-term feedback

First of all, thanks for the feedback in @695: both in the original post as well as the followup discussion. It is great to see the passion with which CSE 331 is being discussed :-)

As I had mentioned in the discussion in @695, one reason why I'm grateful for the post is that it has given me an opportunity to give you a peek in what goes behind the scenes— these are not things to do with the technical aspects but more with the logistics of running CSE 331. I hope that the thoughts below gives you a better perspective on why CSE 331 is run the way it is. Of course that's not to say that all is well— I'm always very grateful for feedback, esp. if you disagree with something about CSE 331 (and even better if you have suggestions on how to improve)! Feel free to use the mid-semester evals (@699) to give those feedback if you prefer to do that anonymously— of course you can also use the comments section below!

In the spirit of perfect not being the enemy of the good, I will just list a bunch of comments related to the feedback in @695 (and not make a huge effort to collect related comments together to have a more coherent reply):

- Exams (and CSE 331) in general have to deal with a lot of competing factors. This is why the exams are a mix of questions that can be answered directly with just a reference to questions that need some thinking during the exam.
- First, while there are students who are interested in algorithms (and theoretical computer science in general), most of the students take CSE 331 because they have to :-)
- What the above means is that while one could insist on CSE 331 only testing whether students really understand the material, it is not clear if that this really would be of service for most students who will never do any serious proofs in the rest of their lives. FWIW the first couple of times I caught CSE 331, I taught it with the attitude that everyone should really understand the material and if the students did not care for that, then tough luck for them. Over the years, I have realized that was not the correct way to approach CSE 331. (See the next couple of points for more on this.)
- For students who will not really use proofs later on, in my mind it is enough if they remember the results even if they cannot derive it/prove it themselves. In other words, if such students e.g. remember that there exists a cycle detection algorithm without

Temp letter grades

Will assign them by Monday

Mini project due in bit over 1 week

note ☆ stop following 128 views

You can submit mini project reports now

You can now submit your mini project videos now. It is due in a bit over 2 weeks: by **11:59pm on Mon, Nov 5**.

The mini-project page has all the details on what is needed in the submission.

Some important points:

- Please make sure you read through the instructions/requirements carefully.
  - Till last year there used to be an intermediate report stage where I could give some preliminary feedback so that y'all could avoid some of the common mistakes in the video. Y'all do not have the luxury, so please make sure you read through the page very very carefully.
- This is a **group submission**. Please see the instructions at the end of this post.
  - Main thing: do **NOT** submit your report till your group is formed.
- **Check on your group**. We are getting close to the resign date. Unfortunately, some students will drop-- so make sure you check with your group mates to see if they'll be around.
  - If your group-mate(s) drop out, then it is OK for you to continue with a smaller group.

HW 6 is out

Homework 6

Due by **11:59pm, Thursday, November 1, 2018**.

Make sure you follow all the homework policies.

All submissions should be done via Autolab.

Question 1 (Programming Assignment) [30 points]

</> Note

This assignment can be solved in either Java, Python or C++ (you should pick the language you are most comfortable with). Please make sure to look at the supporting documentation and files for the language of your choosing.

The Problem

The TennisSuperVillain is hell-bent on destroying earth. Humans have one last hope: the great tennis player Serena Williams.

Last lecture (Lemma 3')

Convert optimal schedule O' to O such that O has no inversions

(a) In O_i exists an inversion (j,k) such that j is scheduled right before k ($d_j > d_k$)

(a.5) Swap j and k to get O_{i+1}

(b) O_{i+1} has one less inversion than O_i

(c) Max lateness(O_{i+1}) ≤ Max lateness(O_i)


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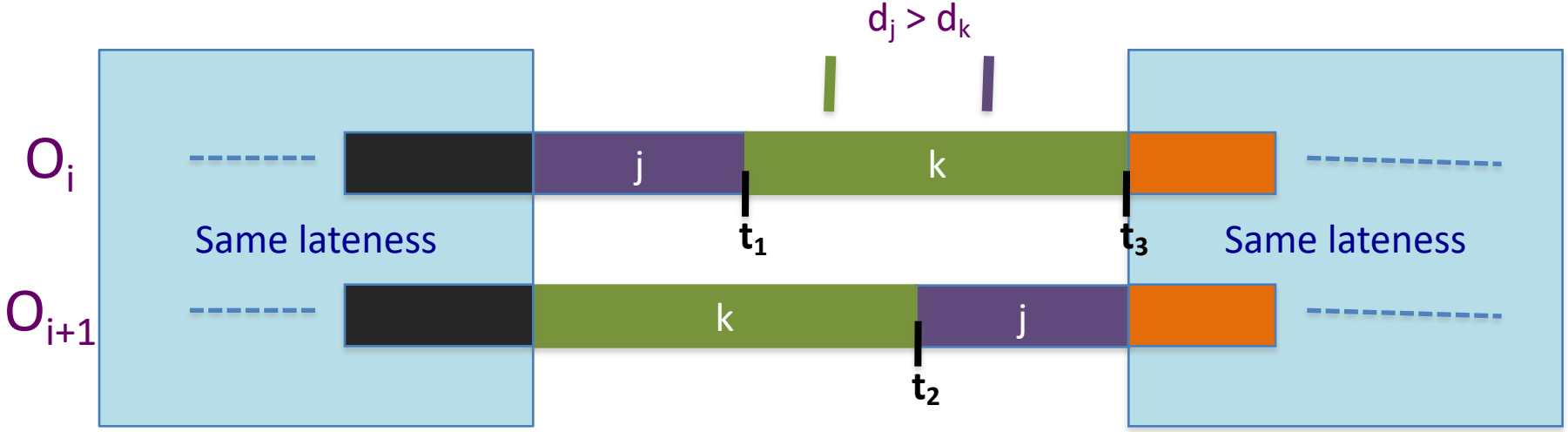
$L(O_{i+1}) \leq L(O_i)$



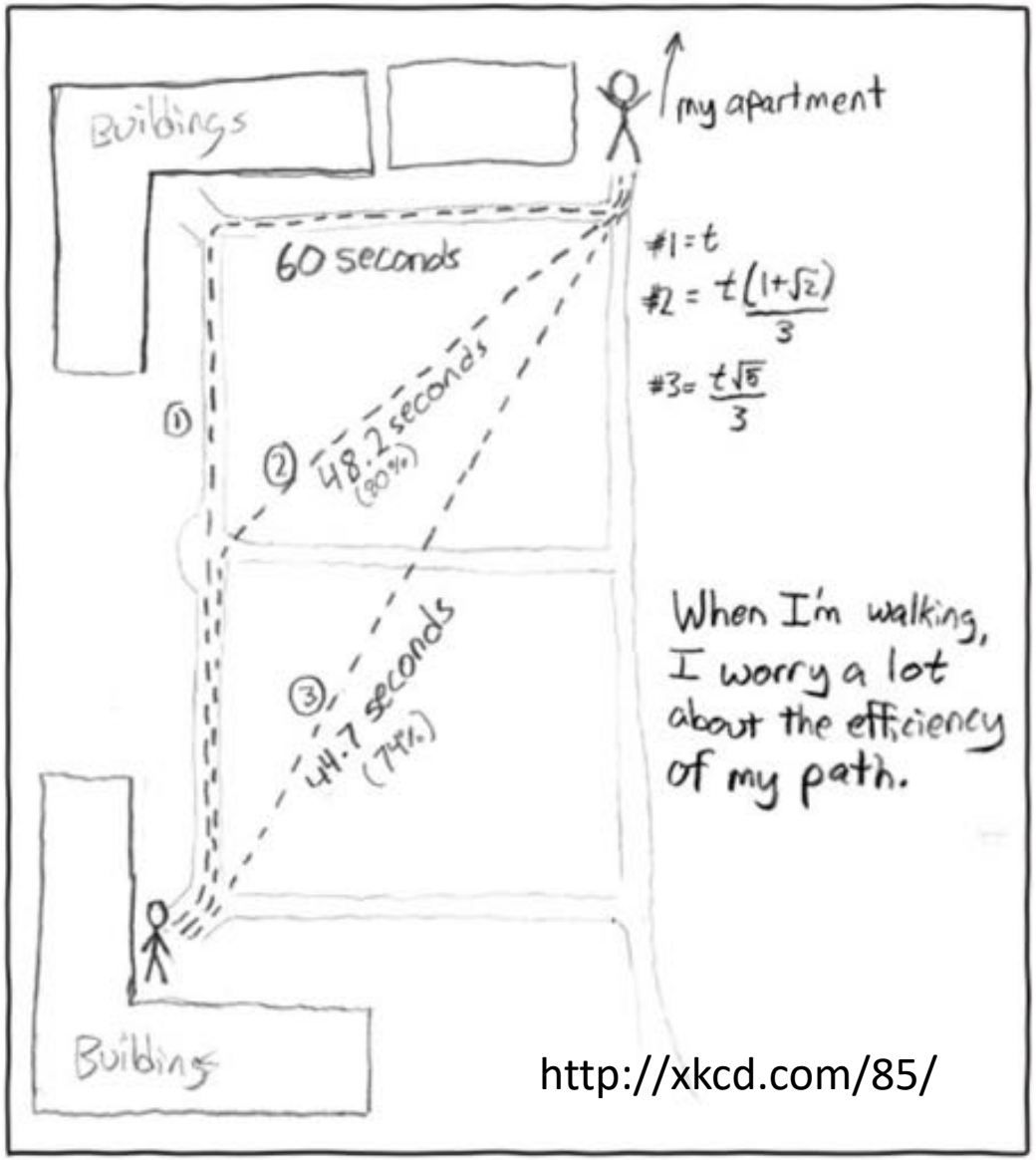
Lateness of k in O_{i+1} ≤ Lateness of k in O_i

Lateness of **j** in O_{i+1} ≤ Lateness of k in O_i

Lateness of j in $O_{i+1} = t_3 - 1 - d_j < t_3 - 1 - d_k$ = Lateness of k in O_i

Today

Shortest Path Problem



Reading Assignment

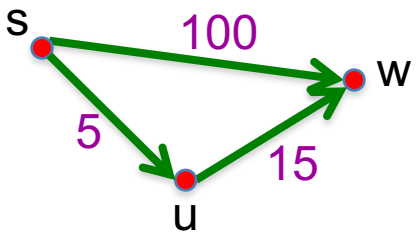
Sec 2.5 of [KT]

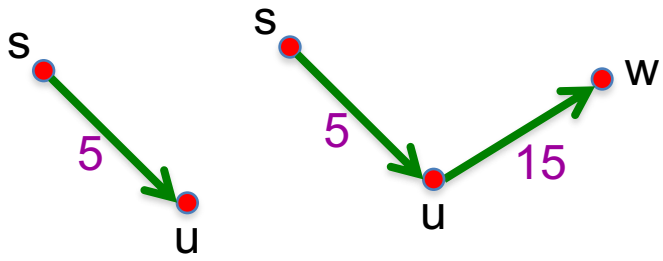
Shortest Path problem

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