

Lecture 21

CSE 331

Oct 22, 2018

Thoughts welcome!

note ☆

stop following

105 views

Midterm Feedback

Sorry but I just wanted to express how I feel about the midterm and maybe give some feedback for future assessments. By no means is this a rant, because I did walk out feeling pretty decent after both midterms, but I just feel like the exams aren't a valid assessment of our actual understanding and learning of the course material.

It seems as if the exams assess our ability to create a library of information and be able to refer to it, which only requires a very vague understanding of the information in order to do so. For example, I know many people who don't know how to actually show that $\sum_{i=1}^n i = \frac{n(n+1)}{2}$, however they knew that the actual proof was in the support pages and they were able to easily refer to that without understanding the proof or being able to recreate it. Although that problem might be outside the scope of the class, similar references could be made with problems from the relevant chapters that we were assessed on.

Many people knew they were able to do things like this before the midterm too, so they spent time preparing by making sure they can cite everything we've seen in class as opposed to actually learning the information. On the other hand, there may be someone who knows how to solve everything from scratch but wasn't aware of what to refer to, and them solving everything from scratch may adversely affect their score as they might run out of time.

Mid-semester course evals

note ☆ 0 views

SEAS mid-semester course evaluation

You should have gotten email about mid-semester evaluation of CSE 331 from SEAS.

I am encouraging you to fill in the evaluations. E.g. if based on the some of the discussions here (@695), you wanted to say something but you wanted to be completely anonymous, feel free to use these mid-semester evals to speak your mind!

[feedback](#)

[edit](#) - good note | 0

Updated Just now by Atri Rudra

Mini Project video due in 2 weeks

Details on your submissions

Next we present what is expected from each of the video and survey as well as their grading guidelines.

The video

Some more remarks before we go into the details:

- If you prefer, you can submit an *unlisted YouTube video* (if you would not like your video be public).
- By default, your submitted video will be on the *CSE 331 webpage*. If you prefer that your video not be on the webpage, please note this explicitly when you submit a link to your video.

The full details on the video part are below.

1. Brief description of the case study along with a reference for your case study.
 - This should include a brief description of the problem, and
 - A brief description of how the chosen algorithm(s) work; i.e. a brief algorithm idea.
2. Brief description of the impact of algorithm(s) on individuals in the case study.

Note

To get **full credit** for this part the individual being impacted should be outside of CSE.

3. Brief description of the impact of algorithm(s) on organizations in the case study.
4. Brief description of the impact of algorithm(s) on society in the case study.

Citations are needed!

Your claimed impact on organizations and society must be backed up by verifiable references. In particular, the citations for your references must appear in the video itself.

Group submission on Autolab

note ☆

3 views

Actions ▾

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 Nov, Oct 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.
 - Even a group of size 1 is OK if you're fine with it. But if not AND if you give me enough notice, I can try and re-assign you to another group.

===== Instructions on forming the group =====

- Under "Options" click on "Group Options"

Scheduling to minimize lateness

n jobs: i th job (t_i, d_i)

start time: s

Schedule the n jobs: i th job gets interval $[s(i), f(i)=s(i)+t_i)$

At most one job at any time

Not the sum

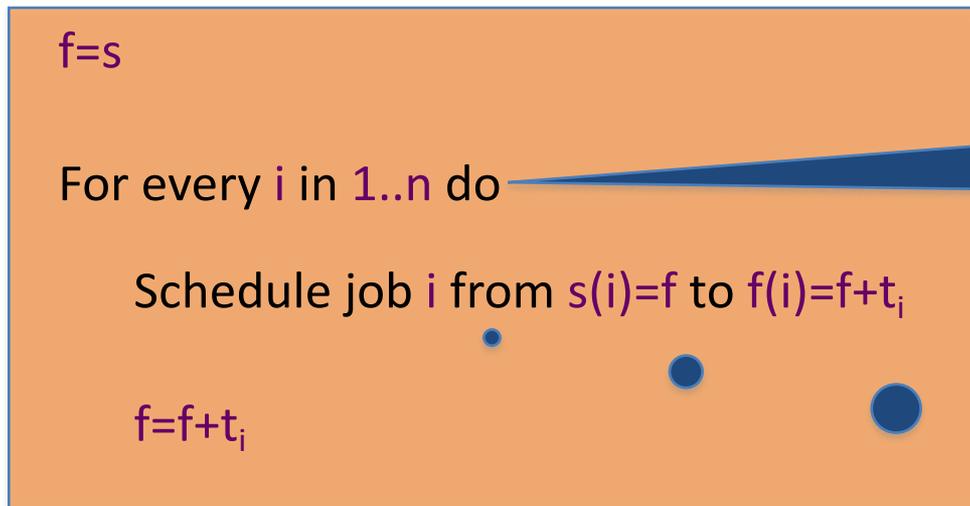
Algo picks $s(i)$

GOAL: Minimize MAXIMUM lateness

Lateness of job i , $l_i = \max(0, f(i) - d_i)$

The Greedy Algorithm

(Assume jobs sorted by deadline: $d_1 \leq d_2 \leq \dots \leq d_n$)

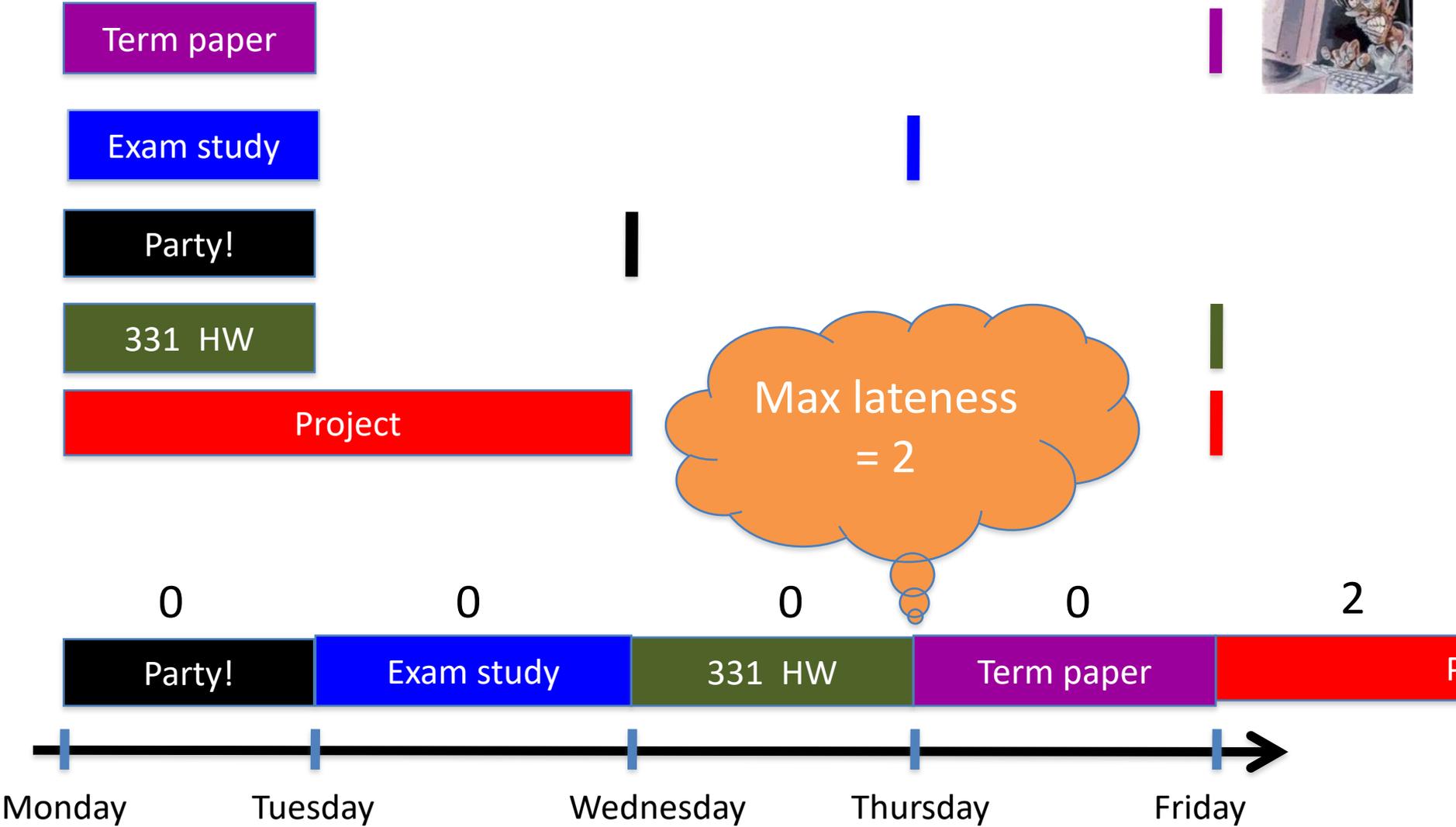


n iterations

$O(1)$ per iteration

$O(n)$ overall.
 $O(n \log n)$ if deadlines are not sorted.

Solving end of Semester blues



Two definitions for schedules

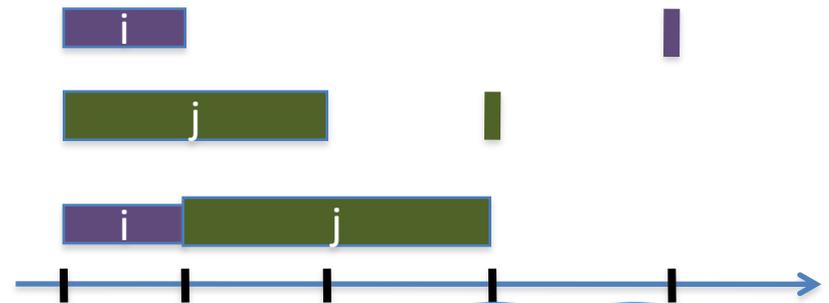
Idle time

Max “gap” between two consecutively scheduled tasks



Inversion

(i,j) is an inversion if i is scheduled before j but $d_i > d_j$



$f=1$

For every i in $1..n$ do

Schedule job i from $s_i=f$ to $f_i=f+t_i$

$f=f+t_i$

0 idle time and 0
inversions for greedy
schedule

We will prove

Any two schedules with 0 idle time and 0 inversions have the same max lateness

Proving greedy is optimal

Any two schedules with 0 idle time and 0 inversions have the same max lateness

Greedy schedule has 0 idle time and 0 inversions

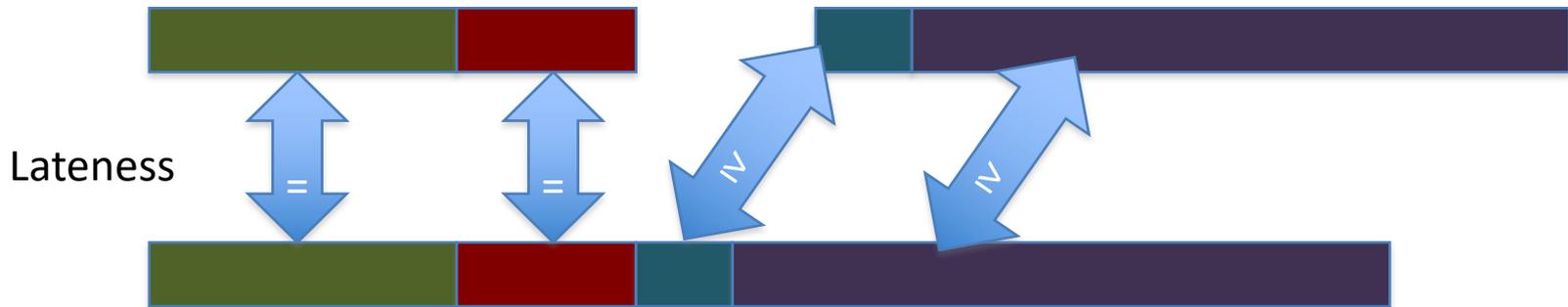
To prove

Any two schedules with 0 idle time and 0 inversions have the same max lateness

Greedy schedule has 0 idle time and 0 inversions

There is an optimal schedule with 0 idle time and 0 inversions

Optimal schedule with 0 idle time



“Only” need to convert a 0
idle optimal ordering to one
with 0 inversions (and 0 idle
time)

Today's agenda

Prove any schedules with 0 idle time and 0 inversions have the same L

“Exchange” argument to convert an optimal solution into a 0 inversion one