

# Lecture 18

CSE 331

Oct 8, 2018

Quiz starts at 8am  
and ends at 8:10am

Lecture starts  
at 8:15am

# Mid-term-I next Monday

note ☆

stop following

133 views

## The mid-term post

First, midterm-I is on **Monday, Oct 15** and midterm-II is on **Wednesday, Oct 17** during the usual class timings (i.e. 8:00-8:50am in Norton 112). Below are some comments that might be helpful to prepare for the mid-term.

(Related post: A followup post on what to do during the exam here: [@460](#))

- Work through the sample mid-term exams ([@458](#)). Do **not** use the sample mid-term to deduce **anything** about the relative coverage of different topics. (See points below for more on the coverage.) The sample mid-terms are meant for you to see the format of the questions. The *actual mid term exams will be harder than the sample mid term exams*. The actual mid-terms will follow the exact same format for the sample midterms: i.e. first mid-term will be only T/F while the second ones will be longer ones.
- I encourage you to not look at the solutions to the sample mid-terms before you have spent some quality time by yourself on the mid-term questions first.
- Use the quiz on Oct 8 ([@461](#)) to get some practice in solving T/F questions under some time pressure. Also review the T/F polls for more examples of such T/F questions.
- Review the HW problems/solutions. There will be at least one problem (among mid-term-I and mid-term-II) that will be closely related to a HW problem. If you did not pick up solutions to a HW (or misplaced them), they'll be available for pickup: more details TBA later this week.
- You **will** be under (a bit of) time pressure in the mid-term exams-- it might be useful for you to use the sample mid-term to decide on how much time you are going to spend on each question. Also read the instructions on the first page and keep them in mind during the exam (the instructions will of course be repeated on the exam sheet).
- If you need help attend the usual recitation, office hours. We will have extra office hours on Friday, Oct 12. (Details TBA later this

# Feedback please!

## CSE 331 Fall 18 Oct feedback

The goal of this form is to collect feedback on various aspects of CSE 331. Please do tell us what is going wrong (so that we can try and fix it) as well as what is going right (so that we can continue doing those things). Filling in this form is completely optional and anonymous.

### Overall your feeling about CSE 331

- Very Happy
- Challenged but happy
- Challenged and meh
- Challenged and unhappy

Please refrain from talking about  
Quiz

In class and on piazza (till noon)

# Interval Scheduling Problem

**Input:**  $n$  intervals  $[s(i), f(i))$  for  $1 \leq i \leq n$

**Output:** A schedule  $S$  of the  $n$  intervals

No two intervals in  $S$  conflict

$|S|$  is maximized

# Analyzing the algorithm

$R$ : set of requests

Set  $S$  to be the empty set

While  $R$  is not empty

    Choose  $i$  in  $R$  with the earliest finish time

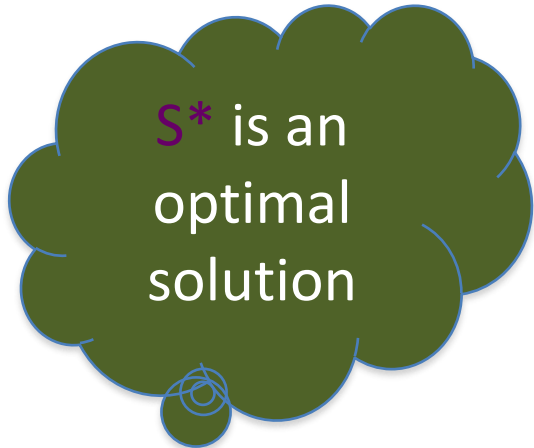
    Add  $i$  to  $S$

    Remove all requests that conflict with  $i$  from  $R$

Return  $S^* = S$



$S^*$  has no conflicts



$S^*$  is an optimal solution



# Greedy “stays ahead”



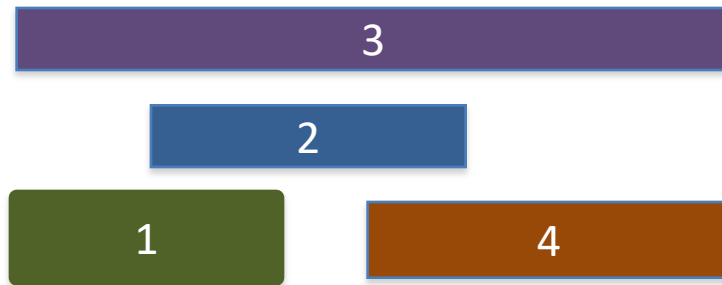
# Today's agenda

Prove the correctness

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  $j$ th 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  $f(i) \leq f(i+1)$

$O(n)$  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  $A^* = A$

# Reading Assignment

Sec 4.1of [KT]



# Questions?



# The “real” end of Semester blues

There are deadlines and durations of tasks



Write up a term paper

Party!

Exam study

331 HW

Project

Monday

Tuesday

Wednesday

Thursday

Friday

# The “real” end of Semester blues

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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

Monday

Tuesday

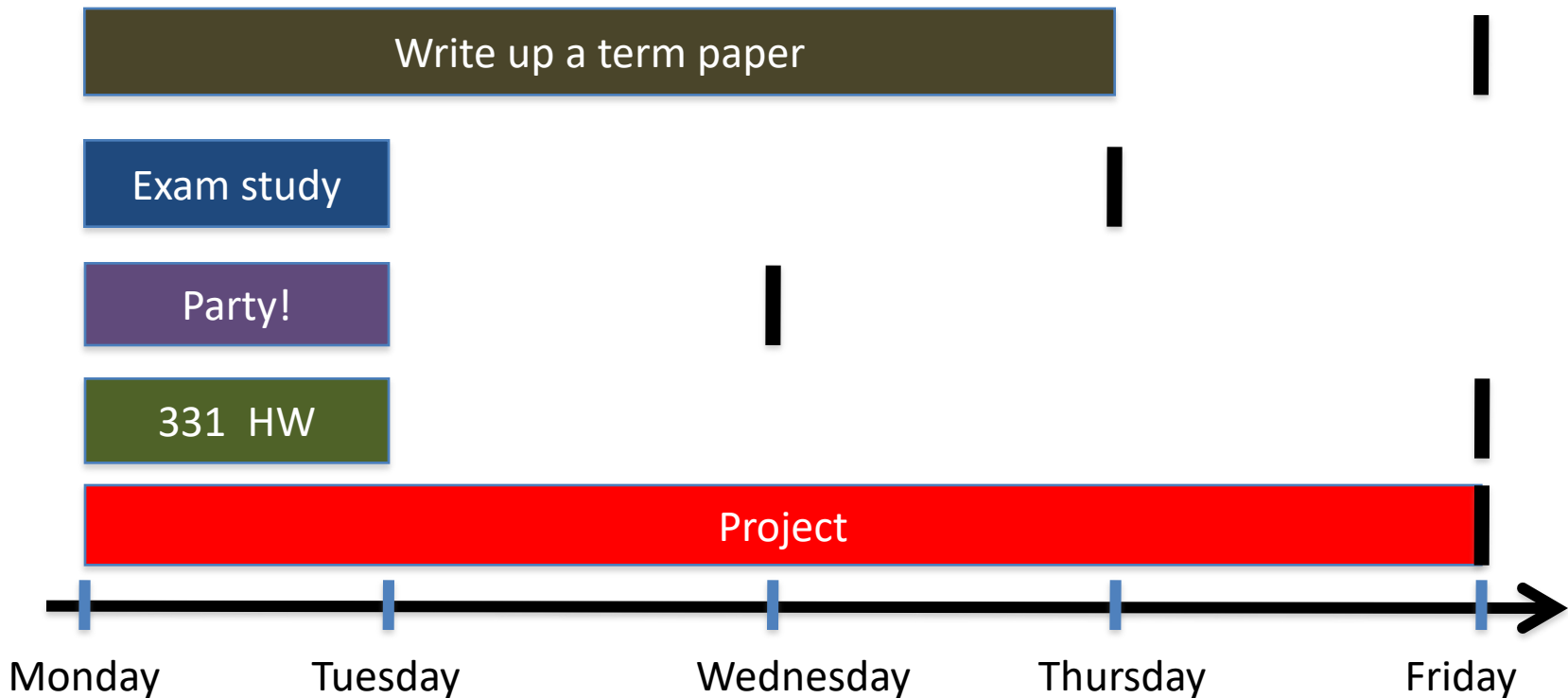
Wednesday

Thursday

Friday

# 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

