Lecture 20

CSE 331

Oct 12, 2018

Mid-term-I Monday

In class

8:00am-8:50am sharp

Eight 2 part True/False with justification Qs

Graded Quiz 1

note ☆ stop following 49 views Actions

Quiz 1 grade and stats

Quiz 1 has been graded and the scores released on Autolab.

Here are the **stats**

Problem	Mean	Median	StdDev	Max	Min
Q1 (a)- part 1	1.1	1.0	0.9	2.0	0.0
Q1 (b)- part 1	1.2	1.0	0.8	2.0	0.0
Q1 (a)- part 2	0.6	0.0	1.0	3.0	0.0
Q1 (b)- part 2	0.9	0.0	1.1	3.0	0.0
Total	3.7	4.0	2.0	10.0	0.0

Graded HW4

Hopefully by tonight

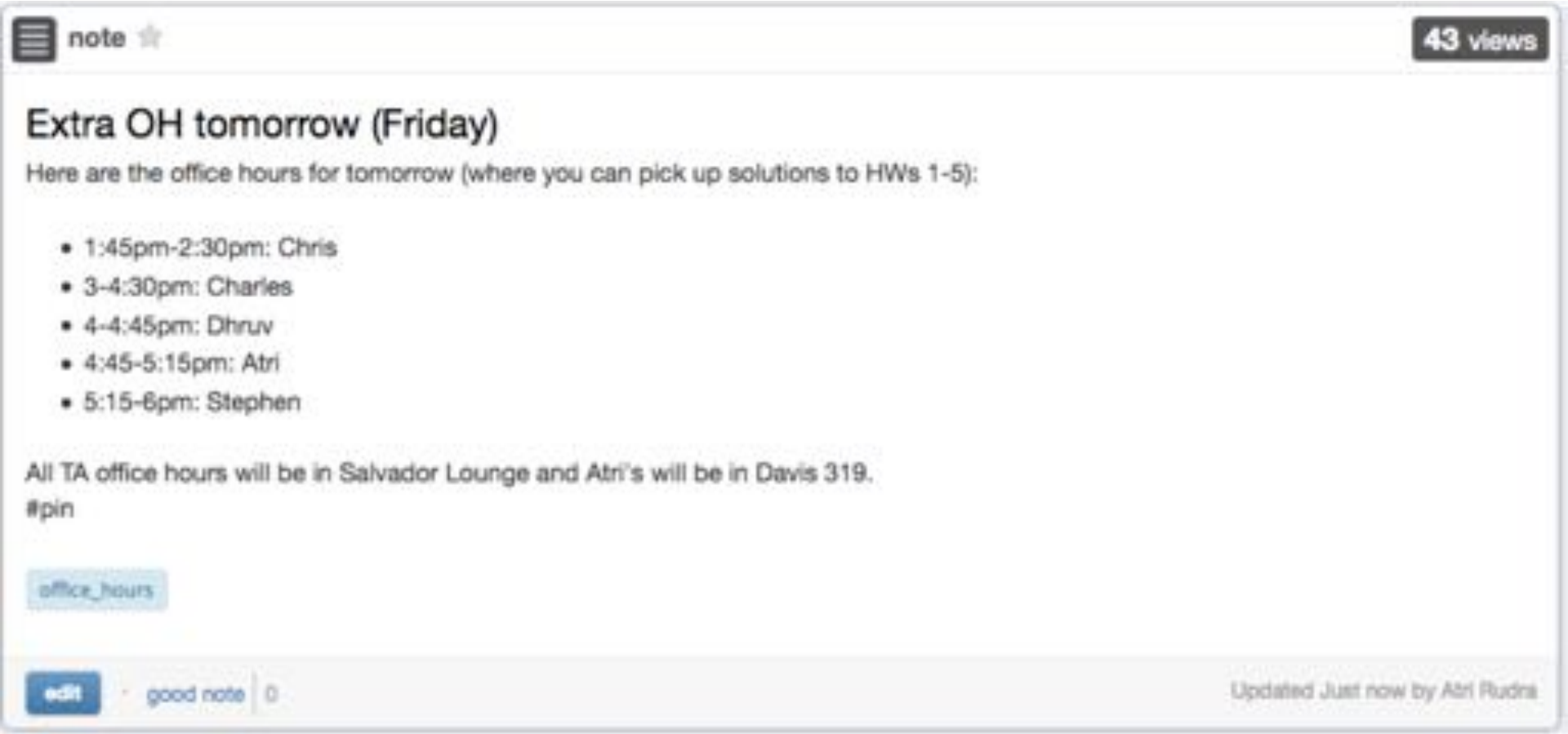
Short review session

“Post mortem” of Quiz 1

HW5 Solutions

At the end of the lecture

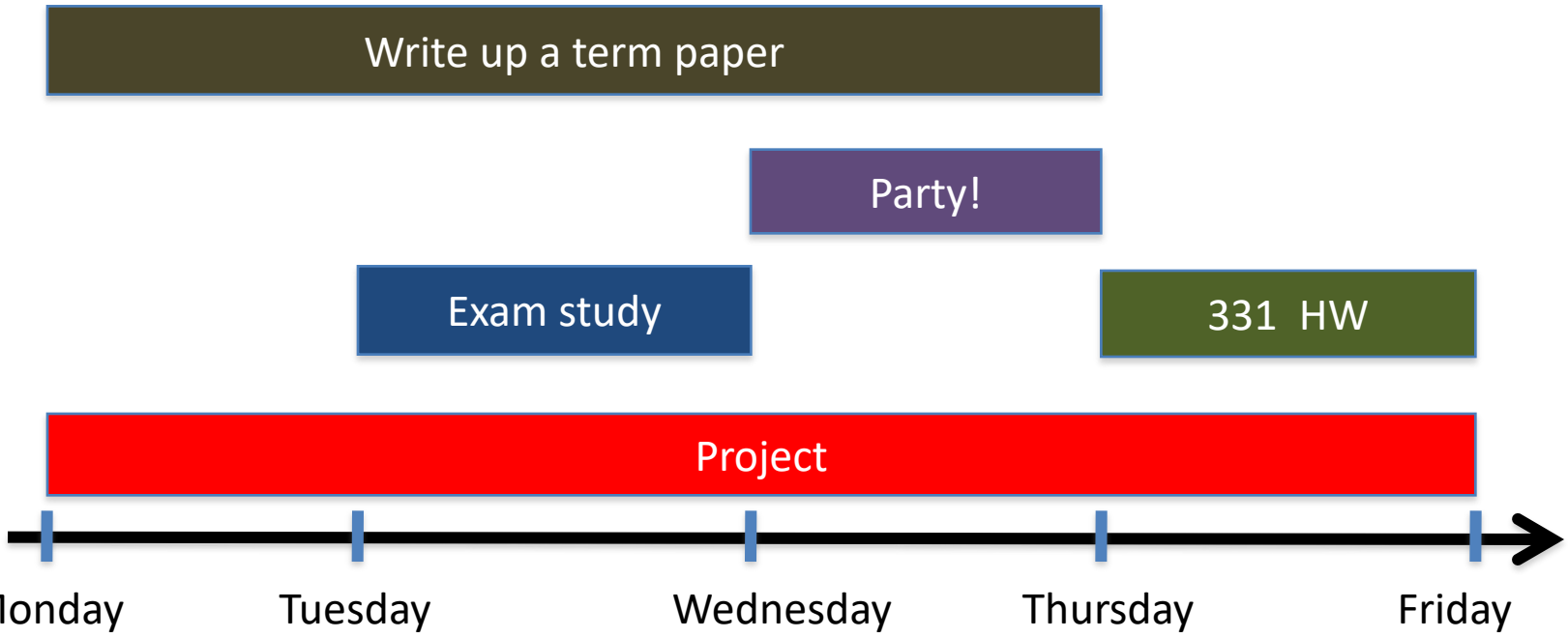
Extra Office Hours today



Questions?

The “real” end of Semester blues

There are deadlines and durations of tasks



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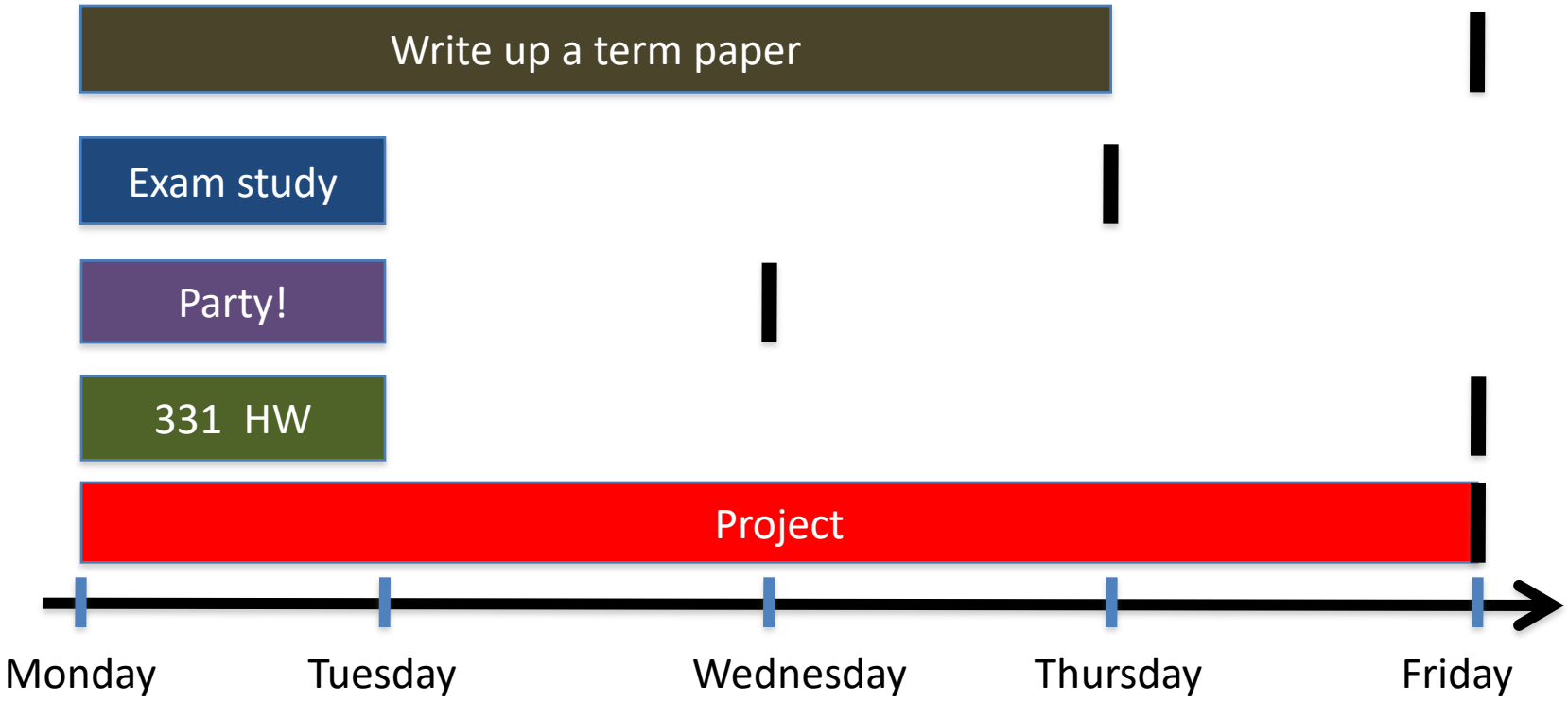


The algorithmic task

YOU decide when to start each task

Write up a term paper

Exam study

Party!

331 HW

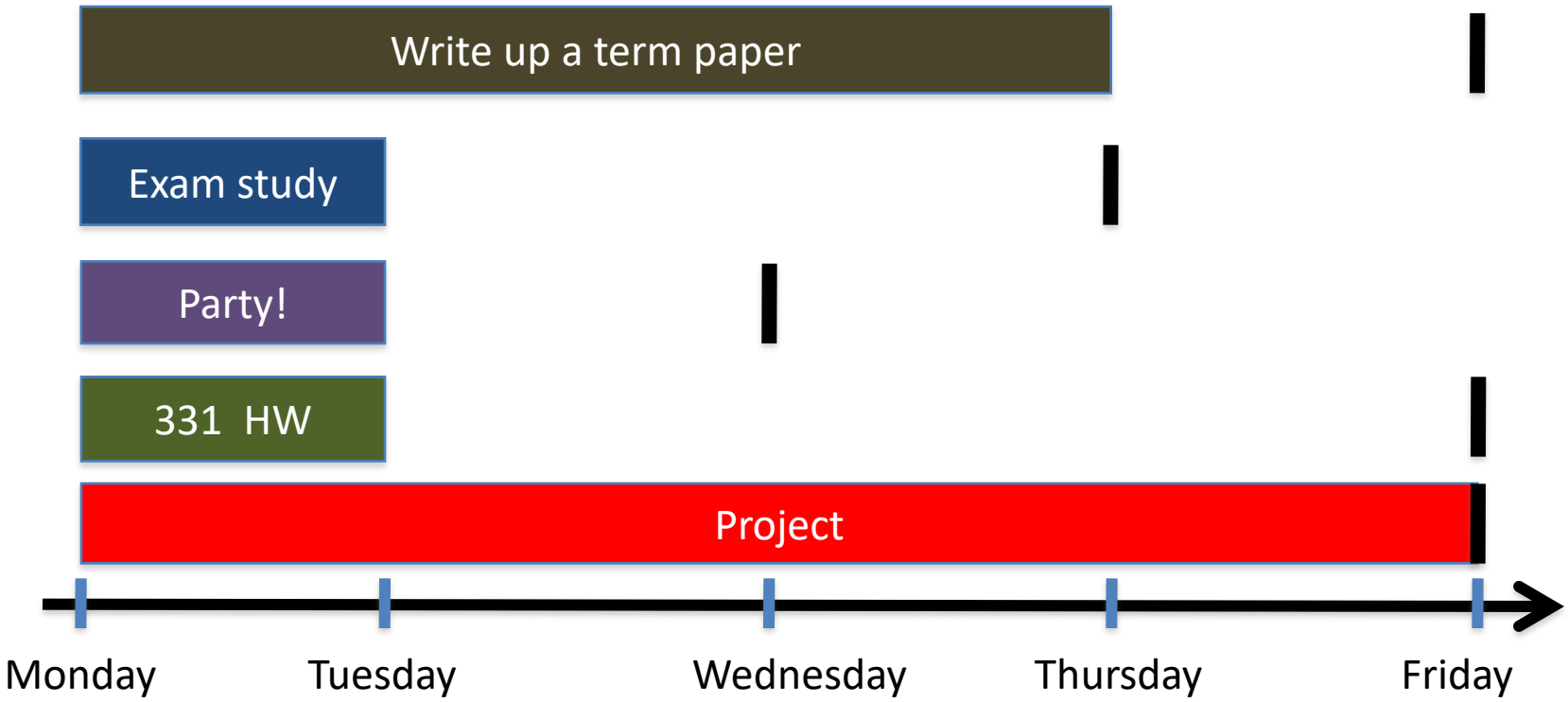
Project

You have to do ALL the tasks

Monday Tuesday Wednesday Thursday Friday

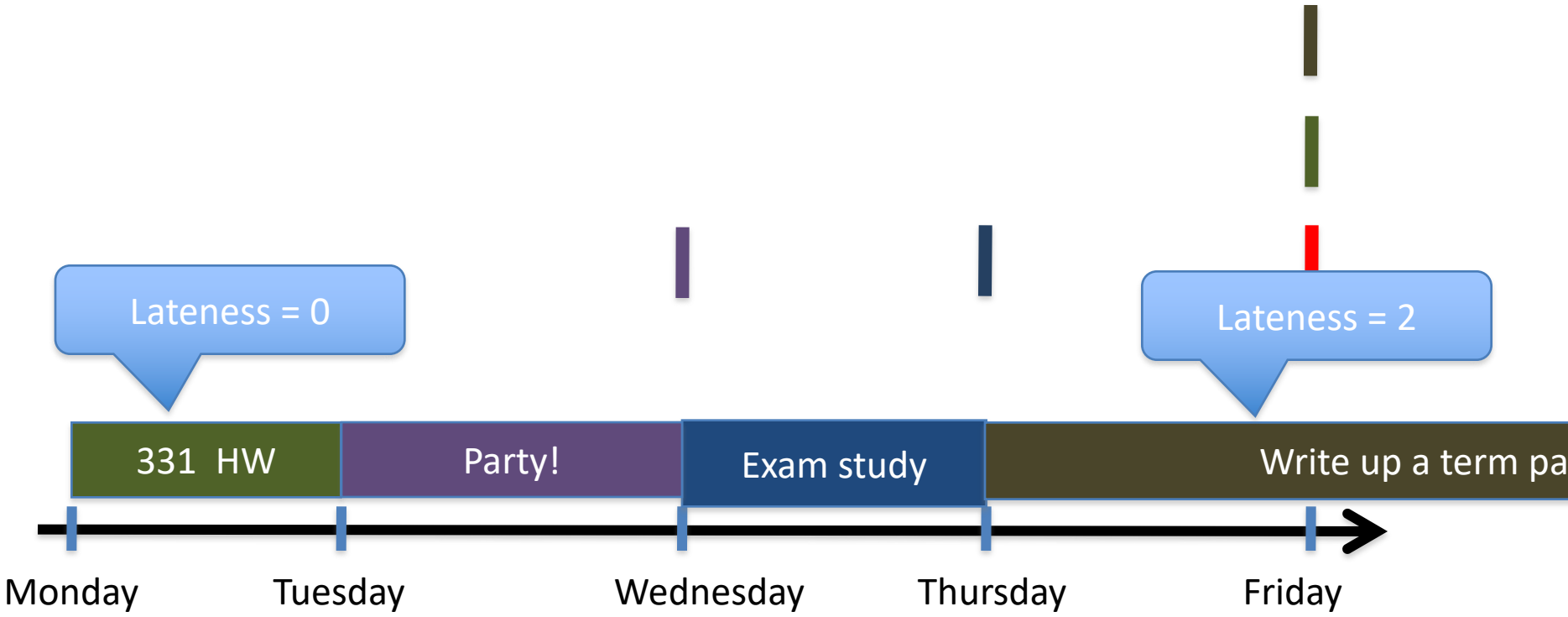
Scheduling to minimize lateness

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

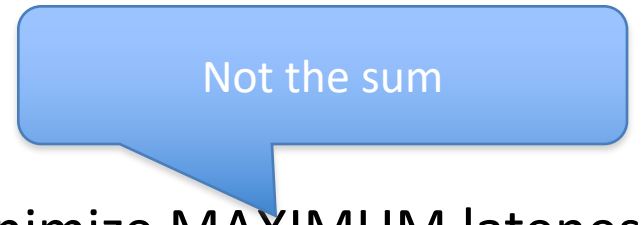


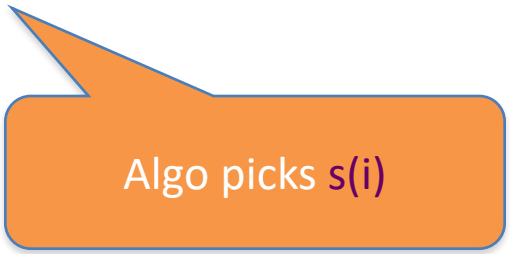
Scheduling to minimize lateness

n jobs: ith job (t_i,d_i)

start time: s

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





GOAL: Minimize MAXIMUM lateness

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

Questions?

The Greedy Algorithm

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

f=s

For every i in 1..n do

Schedule job i from s(i)=f to f(i)=f+t_i

f=f+t_i

n iterations

O(1) per iteration

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

Solving end of Semester blues

Term paper

Exam study

Party!

331 HW

Project

Max lateness
= 2

0 0 0 0 2

Party! | Exam study | 331 HW | Term paper | P

Monday Tuesday Wednesday Thursday Friday

Questions?

Quiz 1 review

(a) **(Part 1)** Argue why the following statement is **TRUE.**
If $f(n) = c \cdot g(n)$, then $2^{f(n)} = \left(2^{g(n)}\right)^c$ for every real number c.

Solution 1

$2^{f(n)} = 2^{c*g(n)} = (2^{g(n)})^c$

A re-statement of what needs to be proven

Solution 2

For any x, y, $(2^x)^y = 2^{x*y}$

$2^{f(n)} = 2^{c*g(n)} = (2^{g(n)})^c$

This argues why the 2nd equality is true

Q1 (a): part 2

(Part 2) Is the following statement true or false? Also remember to briefly JUSTIFY your answer.

If $f(n)$ is $\Theta(g(n))$, then $2^{f(n)}$ is $\Theta\left(2^{g(n)}\right)$.

Solution 1

Not EXACTLY the same problem

This was proven in T/F #4

4th T/F poll

Is the following statement **true** or **false**?

If $f(N)$ is $O(g(N))$, then $2^{f(N)}$ is $O\left(2^{g(N)}\right)$.

- True
- False

Solution 2

The same counter-example from T/F #4 works since there $f(n) = \theta(g(n))$

When re-using, make sure you add in whatever "extra" is needed

Q 1(b): part 2

(Part 2) Is the following statement true or false? Also remember to briefly JUSTIFY your answer.

The Gale Shapley algorithm (with women proposing) on such inputs runs in $O(n)$ time.

True **False** (Please **CIRCLE** your answer)

The Q is asking about specific inputs and not general inputs

Solution 1

FALSE In class we saw GS runs in $O(n^2)$ time

Linear time for GS is $O(n^2)$

Solution 2

TRUE In class we saw GS is a linear time algorithm

Some other reminders

Re-use as much as possible (remember Q3(a) on HW 3!

Make sure your references are precise!

If you do everything from scratch you will NOT be able to finish on time

Review all HWs, recitation notes, piazza T/F Qs, Quiz 1

All this and much more…

note ☆ stop following 174 views

The mid-term post

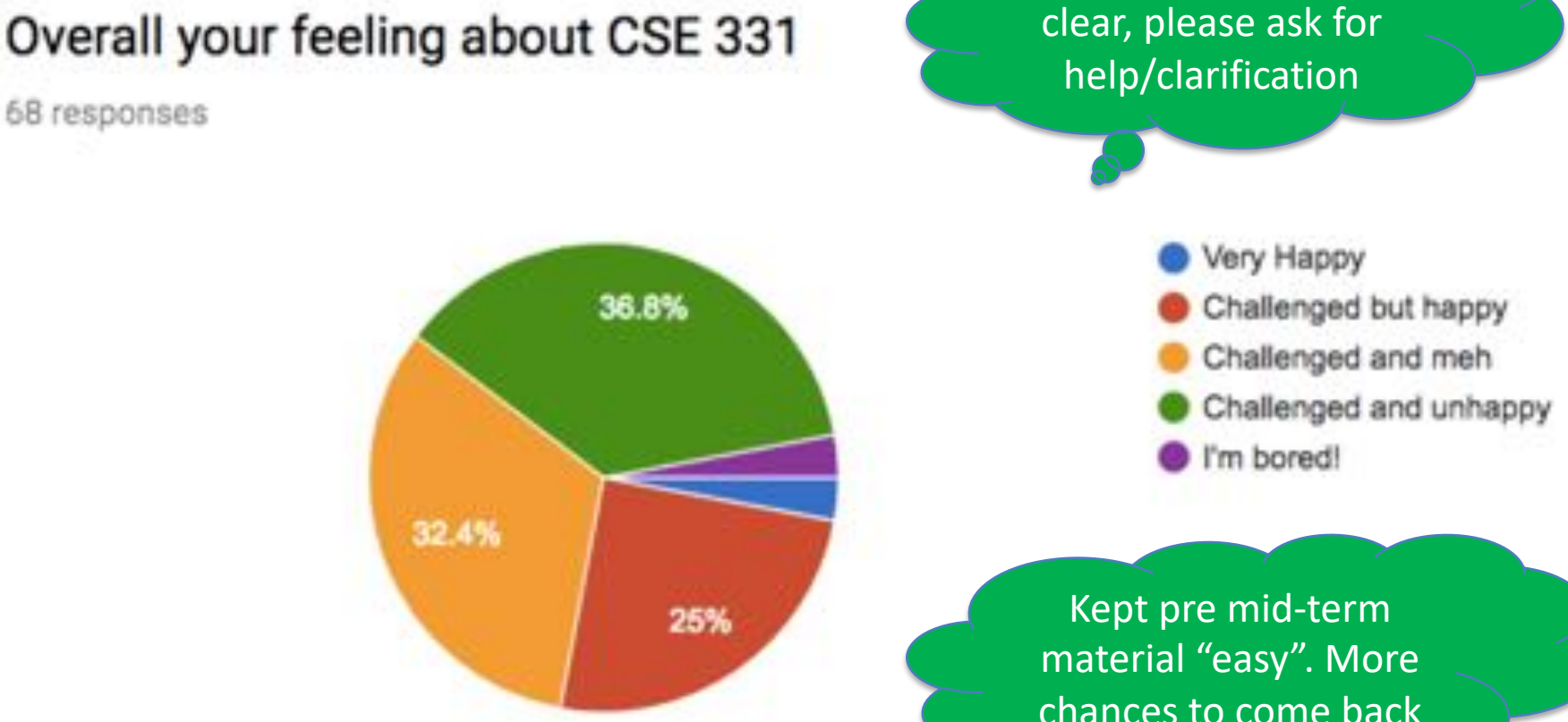
First, midterm-I is on **Monday, Oct 15** and midterm-II is on **Wednesday, Oct 17** during the usual class timings (i.e. 8:00-8:50am in Norton 112). Below are some comments that might be helpful to prepare for the mid-term.

(**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

More detailed feedback response later

If something is not clear, please ask for help/clarification



Kept pre mid-term material “easy”. More chances to come back

Q3 (b) are supposed to hard for groups