Lecture 37

CSE 331

Nov 25, 2019

Upcoming deadlines @11am

Problem 3: **TOMORROW**, Nov 26

There are no optimal algorithms known!

Other than the first problem, we do not know of optimal algorithms to solve the rest of the problems (and we suspect that doing so is not possible (definitely not within a semester). Note that this is unlike the HW Q3s where your code is supposed to always output the optimal/correct solution: i.e. you will have to think of algorithms where you might not be able to prove any guarantee on how good your output is.

Try your solution on all Problems 3 to 5!

Make sure everyone has accept group invitation and THEN submit

Quiz 2: Monday after break

note

71 views

Actions

Quiz 2

A gentle reminder that Quiz 2 is **next Monday (Dec 2) 1-1:10pm** in class. The lecture will start at 1:15pm.

Some other comments:

- Everything we would have covered till the Thanksgiving break will be on the quiz
- There will be three questions:
  - The first two will be T/F without justification (like Q1 on sample final (@1354))
  - The third question will be T/F with justification (like Q2 on sample final (@1354))
- You can bring into **two** sheet of letter sized cheat-sheets (like the final exam)

#pin

quiz2

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Updated Just now by Atri Rudra

Piazza on break

note

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Thanksgiving BREAK

Am posting this note to let y'all know that 331 staff will take an actual break during the thanksgiving break starting this Wednesday. What this means that the TAs are off and I'll be responding very slowly over the break. So expect very delayed answers (on the order of at least a day if not more) over the break.

In particular, if you have any Qs that y'all would like to get answered before the break, make sure you post them by Tuesday.

And of course have a great thanksgiving break! (But see y'all in class on Monday!)
#pin

piazza

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Updated 1 day ago by Atri Rudra

HW 10 Q3 Python template

note

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HW10 Python Template

If you're getting a syntax error with the Python template for HW10, you might not have Python >= 3.6. There were also some issues with indentation.

Please do the following:

- Download the template from the website again
- If you do not wish to update Python:
  - Change line 65 to

```
print('p cnf ' + str(len(input.graph)*input.k) + ' ' + str(len(clauses)), file=f)
```

  - Change line 68 to

```
print(str(variable), end=' ', file=f)
```

- Else update Python to >= 3.6 and you should be good

homework10

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Updated 1 hour ago by Atri Rudra and Sanchit Batra

Sample Final Exam

note

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Sample final exam

This is a bit early but I figured I'll release the sample final exam in case you were planning to prepare for the final exam over the break (and having the sample final helps):

- Sample final
- Sample final solutions

(These are also available under the "Sample Exams" dropdown menu from the banner on the 331 webpage.)

Two comments:

- I would recommend that you not peek at the solution before you have worked on the sample final on your own.
- As with the sample mid-terms, do **not** try and deduce anything about the topic coverage in the actual final exam (will post on how to prepare for the final exam before the break).
    - However, the sample exam was an actual final exam in one of the past years. Your final exam will be of comparable difficulty.

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final

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Updated 5 hours ago by Atri Rudra

Final exam seating

note

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Assigned seating for final exam

Your seating for the final in Norton 112 will be assigned (and you won't be able to sit wherever you find a spot as it was for the mid-term).

I will release more details by Wednesday, Dec 11. In the meantime, two important things to remember:

- **You will HAVE to have your UB card on you during the exam**
  - A TA will come and verify that you are seated in the correct row
- To facilitate the TAs checking your UB IDs, **please keep your bag in the front of the room** (i.e. not with you).

#pin

final

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Updated 1 hour ago by Atri Rudra

The final exam post

note

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Actions

Final exam post

I'll start off with some generic comments:

- The final exam will be based on all the material we will see in class up to the Undecidability stuff (we'll most likely finish that stuff by Wednesday, Dec 4).
  - In case you want a head-start we will cover Sections 8.1-8.4 and Section 8.7 in the textbook. The undecidability stuff will be presented in the lecture only. For the rest the schedule page details what sections of the book we have already covered.
- Exam will be from **12:00pm to 2:30pm** on Friday, **Dec 13** in class (**Norton 112**). Note that the exam will be for 2.5 hours and *not 3 hours* as it says on HUB.
  - If you have **three of more exams scheduled on Dec 13,** please contact me **NO later than 5PM on Wednesday, DECEMBER 4.** *If you contact me after Dec 4, I won't be able to accommodate any re-scheduling request.*
- **DO NOT FORGET TO BRING YOUR UB CARD TO THE** EXAM (@1360)

Next are comments related to **preparing for the finals**:

1. Take a look at the sample final (@1354) and spend some quality time solving it. Unlike the homeworks, it might be better to try to do this on your own. Unlike the sample mid-term, this one is an actual 331 final exam so in addition to the format, you can also gauge how hard the final exam is going to be (your final exam will be the same ballpark). However as with the sample mid-term, you make deductions about the coverage of topics at your own peril (but see points below). Once you have spent time on it on your own, take a look at the sample final solutions (@1354).
2. We will have some extra OHs on Mon Dec 9 to Wed Dec 11 (details TBA).
3. The actual final will have the same format as the sample final: The first question will be T/F, 2nd will be T/F with justification, the rest of the three will be longer questions and will ask you to design algorithms (parts of them might be just *analyzing* an algorithm.)
4. For the T/F questions (i.e. the first two questions), anything that was covered in class or recitations is fair game. If you want to refresh your memory on what was covered, take a look at the schedule page. If you want quick summaries of (almost all) the lectures, review the lecture notes or slides or videos.
5. To get more practice for the T/F questions, review all the T/F polls on piazza.
6. For the remaining 3 questions, one will be on greedy algorithms, one will be on divide and conquer algorithms and one will be on dynamic programming. However, note that Chapter 2 and 3 in the book are basic stuff and almost any question in the final could fall under the purview of those two chapters. There will be **at least** one T/F and one T/F with justification Q for the NP-complete and undecidability material so y'all should definitely focus on those as well but I will not ask any "proof based" Qs on that material.

Course evaluations incentive

note

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Incentive for filling in course evals

As I have done in the past few years, depending on the level of response on the official course evals, I will release come questions on the final exam. (See @1354 to see what Q I mean below)

- If **>=85%** students submit the course evals, I will release **Q1(a)**
- If **>=90%** students submit the course evals, I will release **Q1(a) AND Q2(a)**

Some other relevant comments:

- I will post the current response rate in the comments section below every 3 days AFTER the Thanksgiving break till the deadline
- The % is based on current student registered (249): i.e. it does not include students who have resigned
- I believe this is the link to the course evals: https://sunyub.smartevals.com/
    - But double check the email you might have received on this.

#pin

feedback

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Updated 21 hours ago by Atri Rudra

Questions?

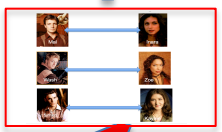
$Y \leq_P X$

Question 2 (Big G is in town)

$\leq_P$

NRMP
National Resident Matching Program

Poly time steps



ANY algo for stable matching problem works!

Arbitrary Y instance

Pre-process the input

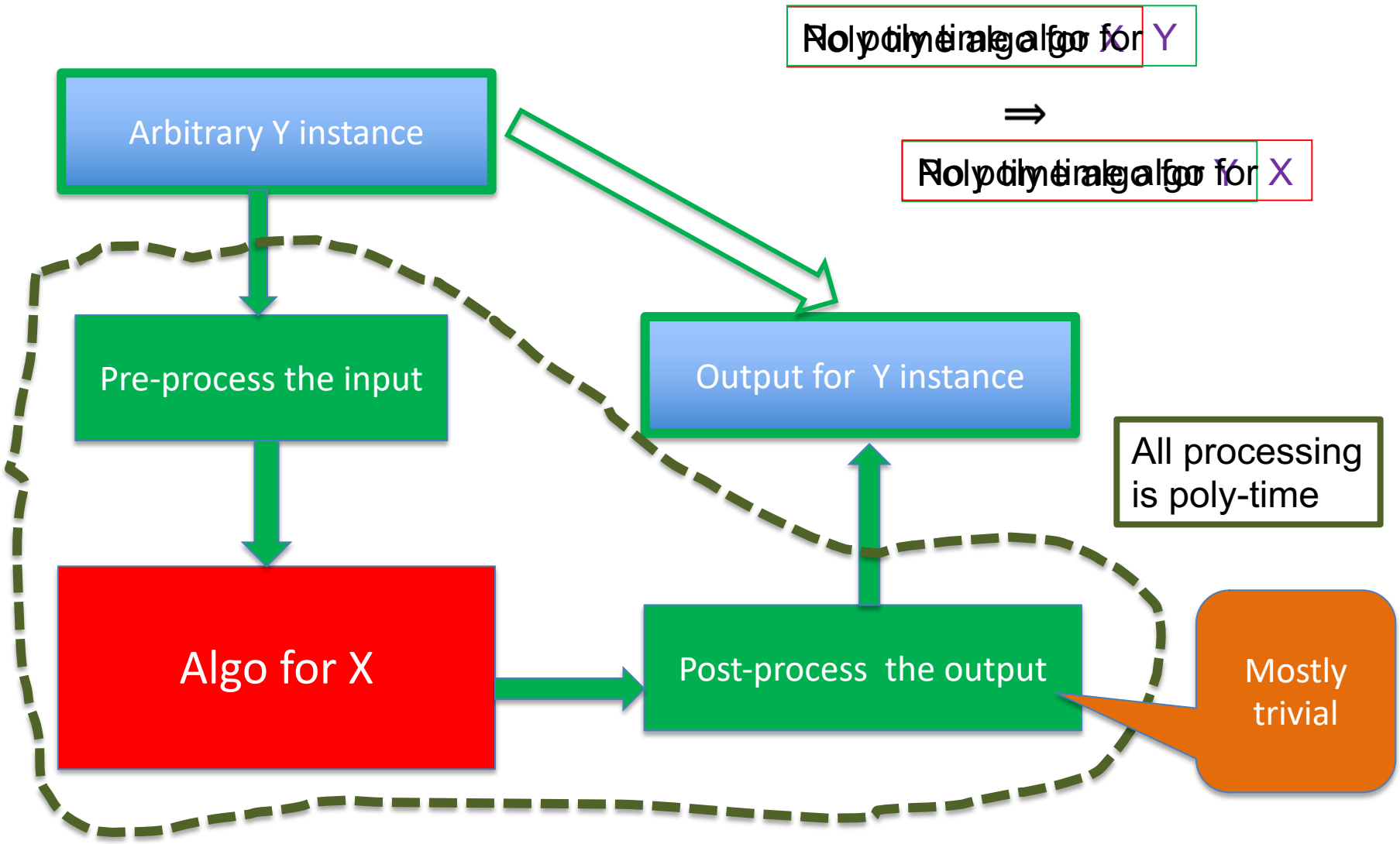
Algo for X

Post-process the output

Output for Y instance

All processing is poly-time

Implications of $Y \leq_P X$



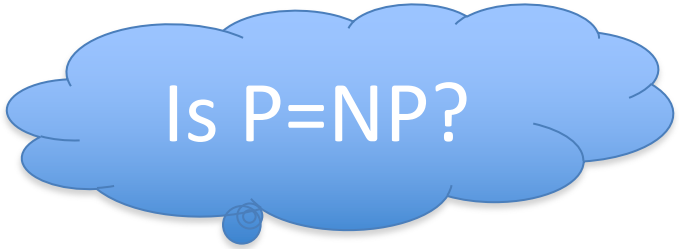
On Friday

3-SAT $\leq_P$ Independent Set

Sec 8.2 of [KT]

P vs NP question

P: problems that can be solved by poly time algorithms



NP: problems that have polynomial time verifiable witness to optimal solution