Lecture 39

CSE 331

Dec 4, 2019

Upcoming deadlines @11am

Problems 4,5: **FRIDAY**, Dec 6

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 4 to 5!

Make sure everyone has accept group invitation and THEN submit

Graded HW 9

Hopefully by tomorrow

Questions?

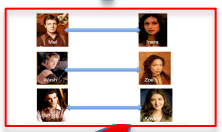
$Y \leq_P X$

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

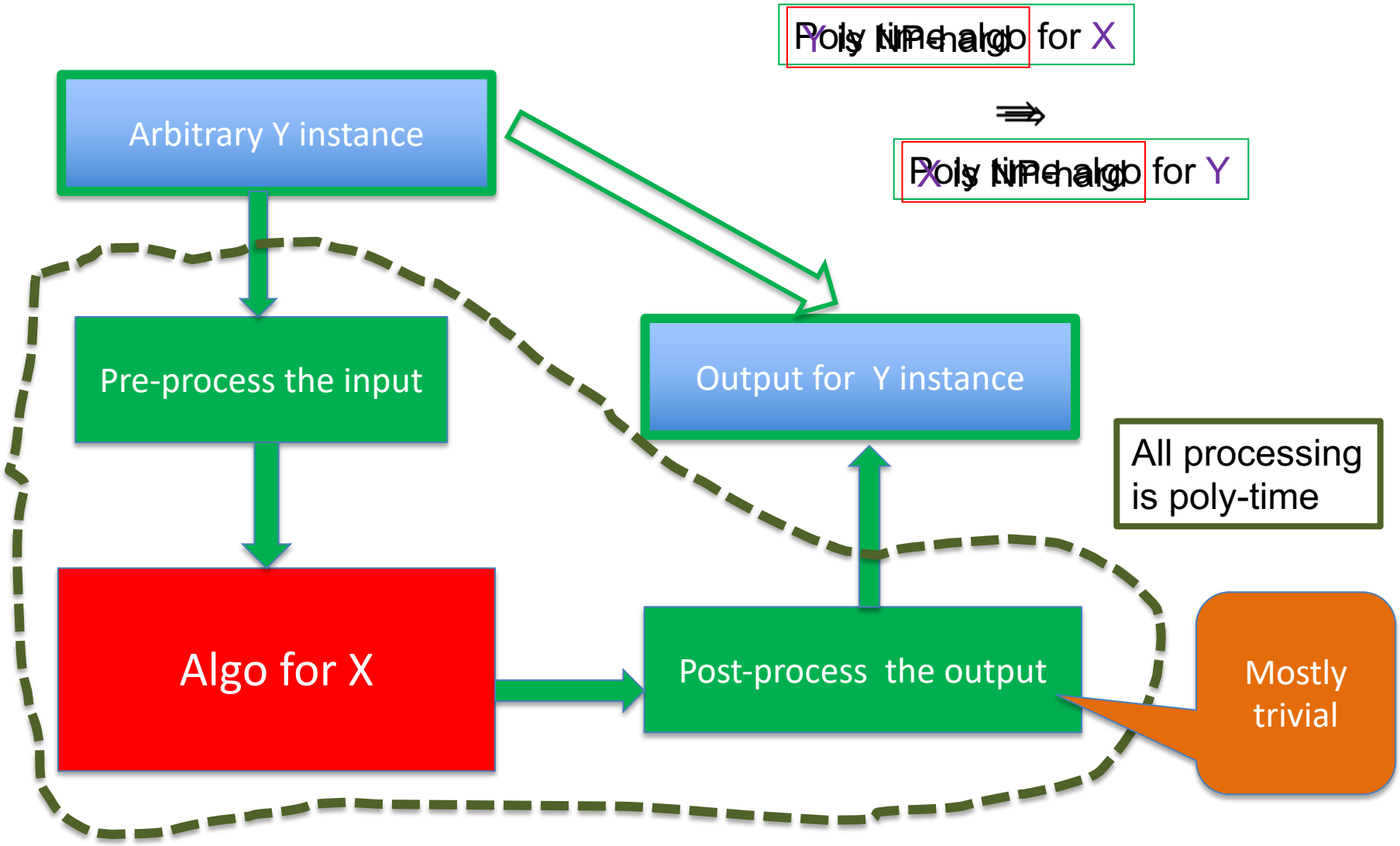
Algo for X

Post-process the output

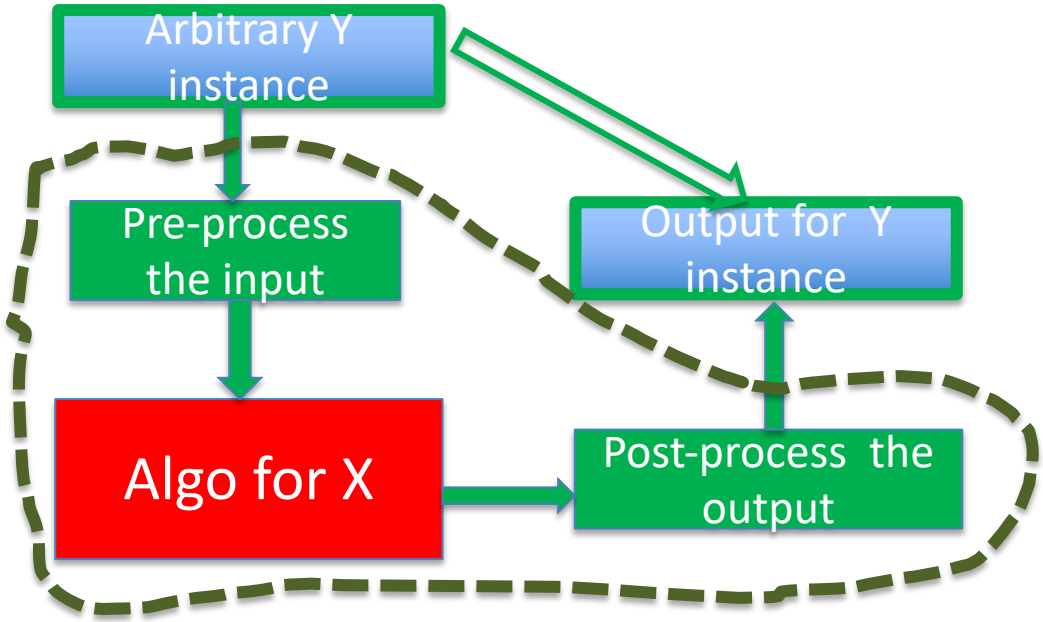
Output for Y instance

All processing is poly-time

Implications of $Y \leq_P X$



Independent Set $\leq_P$ Vertex Cover



AlgoIS (G,k)

G' = G

k' = n-k

b = AlgoVC(G',k')

return b

Questions?

Today's agenda

NP-completeness of k-colorability

Beyond NP-completeness