Lecture 21

CSE 331 Oct 21, 2022

Project deadlines coming up

Fri, Oct 28	Counting Inversions F21 F19 F18 F17 x ³	[KT, Sec 5.3] (Project (Problem 1 Coding) in)
Mon, Oct 31	Multiplying large integers ^{F21} ^{F19} ^{F18} ^{F17} ^{x²}	[KT, Sec 5.5] (Project (Problem 1 Reflection) in) Reading Assignment: Unraveling the mystery behind the identity
Wed, Nov 2	Closest Pair of Points D ^{F21} D ^{F19} D ^{F18} D ^{F17} x ²	[KT, Sec 5.4]
Fri, Nov 4	Kickass Property Lemma P ^{F21} P ^{F19} P ^{F18} P ^{F17} x ²	[KT, Sec 5.4] (Project (Problem 2 Coding) in)
Mon, Nov 7	Weighted Interval Scheduling D ^{F21} D ^{F19} D ^{F17} x ^a	[KT, Sec 6.1] (Project (Problem 2 Reflection) in)

Group formation instructions

Autolab group submission for CSE 331 Project

The lowdown on submitting your project (especially the coding and reflection) problems as a group on Autolab.

Follow instructions **EXACTLY** as they are stated

The instruction below are for Coding Problem 1

You will have to repeat the instructions below for EACH coding AND reflection problem on project on Autolab (with the appropriate changes to the actual problem).

Form your group on Autolab

Groups on Autolab will NOT be automatically created

You will have to form a group on Autolab by yourself (as a group). Read on for instructions on how to go about this.

Mid-term temp grade assigned

note #323 🔘 🛧 🔒 -

Mid-term temp grade

For details on grading of mid-term exam, see #311 and #315. More details on one-on-one meetings see #324)

Your temp letter grades have been assigned. To calculate your grade, you must first calculate your raw score R as follows:

- Add up your HW scores from HW1-3 to calculate H (out of a max of 300).
- . Let Q be your guiz 1 score jout of a max of 103
- Let M be your mid-term score jout of a max of 100.

Then R is calculated as follows jout of a maximum possible of 55):

 $R = \underset{\sim}{=} \cdot H + Q \cdot \underset{\sim}{=} + \underset{\sim}{=} \cdot M.$

(I know the above does not fully follow the grading-ubric since it does not drop any HW score and does not substitute the quiz score with the HW score if you do better on the latter. However, since this is just supposed to give you an idea of where you stand in the course, I think the above is fine as a proxy)

Here are the stats of the raw score:

· Average: 21.1

- + Median: 18.1
- Bid. Dec: 13.57
- + Max: 47.86

For those who are interested the median raw score is essentially the same as last year)

Now to calculate your letter grade, read it off from the following map:

A: R = 149.5, 501



1-on-1 meetings

note #324 () () 👸 - 🗌



Meetings to discuss CSE 331 performance

By toroight, I sell email these which are a D+ or below in their mel-term grade (for more details on the grade are \$1273) to setup a one-on-one meeting to talk with me but / Squret / should post the information about meeting times now rather than later toroight.

Of course you can else come and talk about your 331 performance even if you have a temp grade higher than D+ (though abutents with a D+ or below will get preference).

These tacked out contain times poor next week or so for 10 mines meetings. Please mite that these are NOT wolk-life: If no one signs up for a stol, I will NOT to on zoom two. If plu went to come and talk with me, please EMAIL me with ALL the shole before that werk for you: Enviro the store on please will not score store that with me, please EMAIL me with ALL the shole before that werk for you: Enviro the store on please will not score and talk with me, please EMAIL me with ALL the shole before your scheduled stor.

Nate: These are my current availabilities - some of the state might be used up in some other non-CSE 321 meetings. So please send multiple chocke for when you can meet.

To make things eases. All, meeting will be an asses inter- https://www.wi/Writ/2006/0007/ywit-Wyrt.0t-WorkCluMACROUNTER.

Below are all the available slots portow the start times are letted; a slot that is already taken has a strike through).

- Thursday (Det 80): 800an, 8:10an, 8:00an, 8:00an, 10:00an, 10:00an, 11:00an, 11:00an, 11:00an, 12:00pn, 12:00pn, 12:00pn, 12:00pn, 1:00pn, 1:00pn
- Pridag (Dot 21) 9:00am, 8:10am, 9:30am, 9:45am, 10020am, 1:30pm, 1:45pm, 4:00pm, 4:30pm, 4:30pm
- Monday (Det 24): 9:00am, 9:15am, 9:00am, 9:45am, 10:00am, 3:00pm, 3:15pm, 8:80pm, 6:15pm
- Friday (Det 28) (100am, 815am, 930am, 946am, 1000am, 120pm, 1141pm, 3100pm, 311pm, 330pm, 3145pm

(Apolingies but intra-set) and he next in this week and next is bit of a meas. If none of the lines above work for you dult used to meek, please envel me and we can set as a time for the week of Oct 311

Yau can of course alike stop by during my office heurs due students with Qs on the HWs will get legter privily) and you unfortunately central book a leot during my usual office hours.

Again, pleases estual the your (at least top 3) choices along with preference for in-person or virtual (again note the ALL status are virtual).



Questions/Comments?



Minimum Spanning Tree Problem

Input: Undirected, connected G = (V, E), edge costs c_e

Output: Subset $E' \subseteq E$, s.t. T = (V,E') is connected C(T) is minimized

If all c_e > 0, then T is indeed a tree

Kruskal's Algorithm

Input: G=(V,E), $c_e > 0$ for every e in E

T = Ø

Sort edges in increasing order of their cost

Consider edges in sorted order



Joseph B. Kruskal

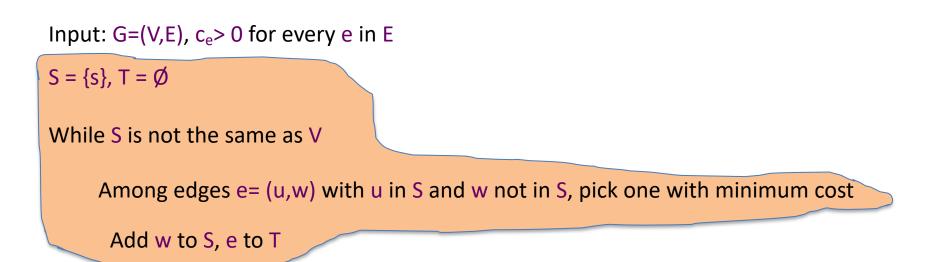
If an edge can be added to T without adding a cycle then add it to T

Prim's algorithm

Similar to Dijkstra's algorithm

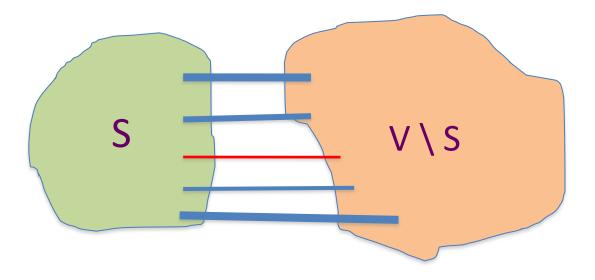


Robert Prim



Cut Property Lemma for MSTs

Condition: S and V\S are non-empty



Cheapest crossing edge is in all MSTs

Assumption: All edge costs are distinct

Questions/Comments?



Today's agenda

Optimality of Prim's algorithm

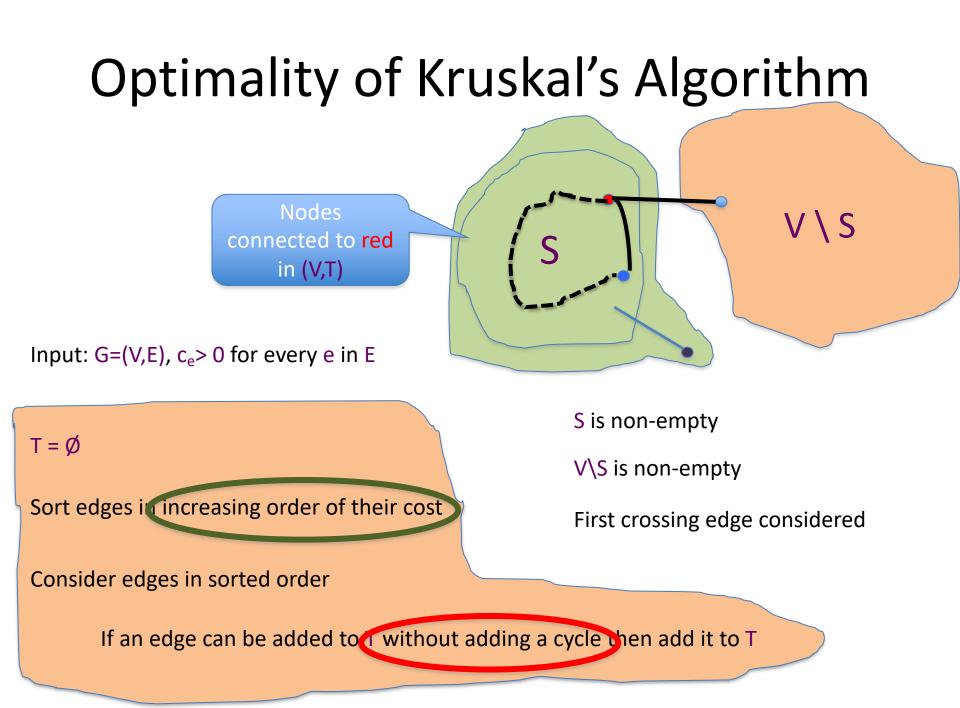
Prove Cut Property Lemma

Optimality of Kruskal's algorithm

Remove distinct edge weights assumption

On to the board...





Is (V,T) a spanning tree?

