Lecture 26

CSE 331

Nov 2, 2018

Have fun at UB Hacking!

As will your TAs….

note ☆ stop following 14 views

UB Hacking!

Hope y'all are excited about UB Hacking! I'll stop by over the weekend and hope to see some of you there.

Now back to 331 logistics: many of your TAs will either be organizing UB Hacking or taking part. What this means is our response on piazza over the weekend will be muted a bit. I'll try and check-in once a day but apologies in advance for any delay in getting back to y'all.

And to nip this Q off in the bud: no, there will not be any extension to HW 7.
#pin

homework7 piazza

edit · good note | 0 Updated 3 minutes ago by Atri Rudra

HW 7 is out

Homework 7

Due by **11:59pm, Thursday, November 8, 2018**.

Make sure you follow all the homework policies.

All submissions should be done via Autolab.

Question 1 (Programming Assignment) [30 points]

</> Note

This assignment can be solved in either Java, Python or C++ (you should pick the language you are most comfortable with). Please make sure to look at the supporting documentation and files for the language of your choosing.

The Problem

In this problem, we will explore weighted graphs.

Once you understand what Q2 is asking, it'll be easy

HW 6 Solutions

At the END of the lecture

Video due Monday

note ☆ stop following 150 views

You can submit mini project video now

You can now submit your mini project videos now. It is due in a bit over 2 weeks: by **11:59pm on Mon, Nov 5**.

The mini-project page has all the details on what is needed in the submission.

Some important points:

- Please make sure you read through the instructions/requirements carefully.
  - Till last year there used to be an intermediate report stage where I could give some preliminary feedback so that y'all could avoid some of the common mistakes in the video. Y'all do not have the luxury, so please make sure you read through the page very very carefully.
- This is a **group submission**. Please see the instructions at the end of this post.
  - Main thing: do **NOT** submit your report till your group is formed.
- **Check on your group**. We are getting close to the resign date. Unfortunately, some students will drop-- so make sure you check with your group mates to see if they'll be around.
  - If your group-mate(s) drop out, then it is OK for you to continue with a smaller group.
    - Even a group of size 1 is OK if you're fine with it. But if not AND if you give me enough notice, I can try and re-assign you to another group.

Peer evaluation due Wed 11:59pm

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Peer evalutation for mini project (please test it out!)

Peer evaluation for mini project is now live on Autolab. See the mini project details page ("Survey" section) for more background on this.

We are doing this for the first time in CSE 331 and Autolab is not really setup to take this kind of input and we had to wrangle with it a bit. So **we would really appreciate it if y'all could test it out now and give us feedback**. You can fill it for "real" once you have submitted the video and can answer the questions in the survey correctly. For now, I'm looking for feedback to make sure there are no bugs etc.

Some important remarks:

- There is some checking being done on Autolab regarding your input (specifically the UBIT IDs of your group mates) but you will not see any of those when you fill in the form, which is static.
  - **Please be sure to check the feedback** (by clicking on numbers like you usually do for Q1) to see if there are any issues.
- **If one of your group-mates have dropped, please test out the system by FRIDAY and let me know if you still have a member showing up in the feedback who should not be there.** The start of the feedback will list the UBIT IDs of your group mates.
  - I went through my email and dropped students from groups who had emailed me to say they were dropping out but I'm pretty sure I do not have the latest information.
- *You will need to know the exact UBIT IDs of your group-mates to fill in the form.*
  - If you mis-spell it or add the @buffalo.edu at the end of the UBIT ID, then there were error messages in the feedback.
- **The scores that you see are NOT your final scores.**
  - Your final score on the survey part will be uploaded manually later on in the semester

Kruskal's Algorithm

Joseph B. Kruskal

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

$T = \emptyset$

Sort edges in increasing order of their cost

Consider edges in sorted order

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

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

$S = \{s\}$, $T = \emptyset$

While S is not the same as V

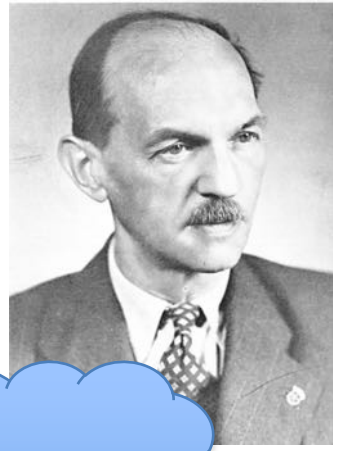
Among edges $e= (u,w)$ with u in S and w not in S, pick one with minimum cost

Add w to S, e to T

(Old) History of MST algorithms

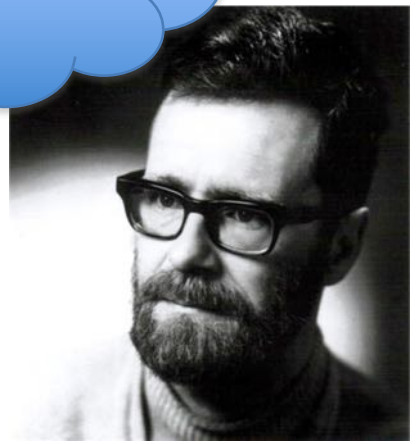
1920: Otakar Borůvka

1930: Vojtěch Jarník



Same algo!

1956: Kruskal



1957: Prim

1959: Dijkstra

Some modern Algo Researchers

Can you guess the common link?







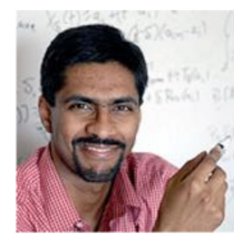




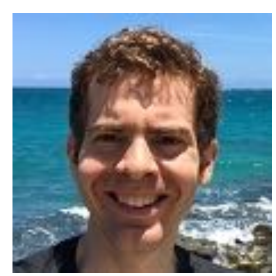






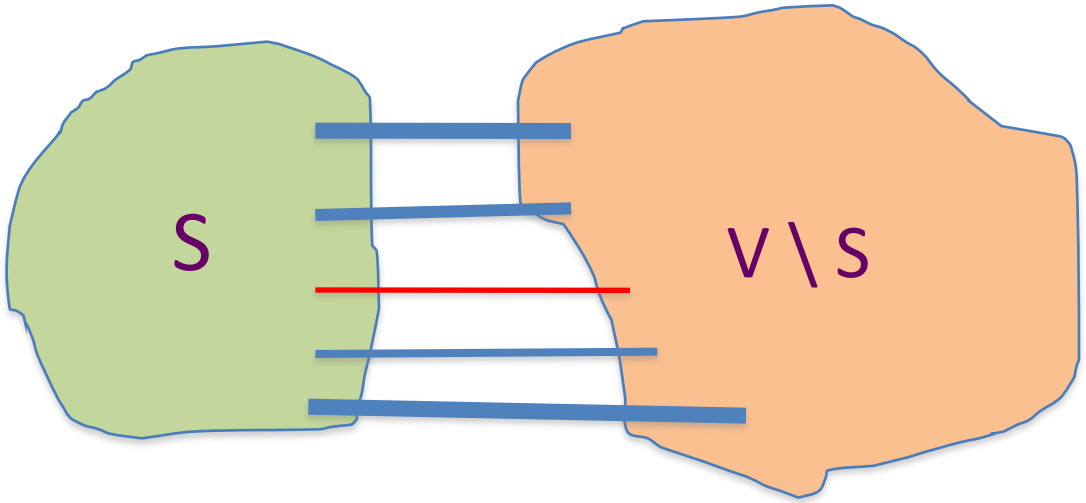







Cut Property Lemma for MSTs

Condition: S and V\S are non-empty



Cheapest crossing edge is in **all** MSTs

Assumption: **All edge costs are distinct**

Today's agenda

Prove Cut Property Lemma

Prove correctness of Prim's+Kruskal's algorithm using Cut Property Lemma