Lecture 25

CSE 331

Oct 27, 2014

Bunch of mid-term related stuff up

note ☆

stop following 52 views

The mid-terms mega post

In this post, I am collecting all the posts related to mid-term and grading etc so easy reference. I will pin this post for about a week so that this post will be easy to spot for a while.

- Solutions for Mid-term-I: @305
- Solution Sketches for Mid-term-II: @318
- Statistics for the combined mid-term scores: @316
- Grading rubric for the mid-terms: @321
- Details on temp grade: @322
- Slots for one-on-one meetings with me this week: @323

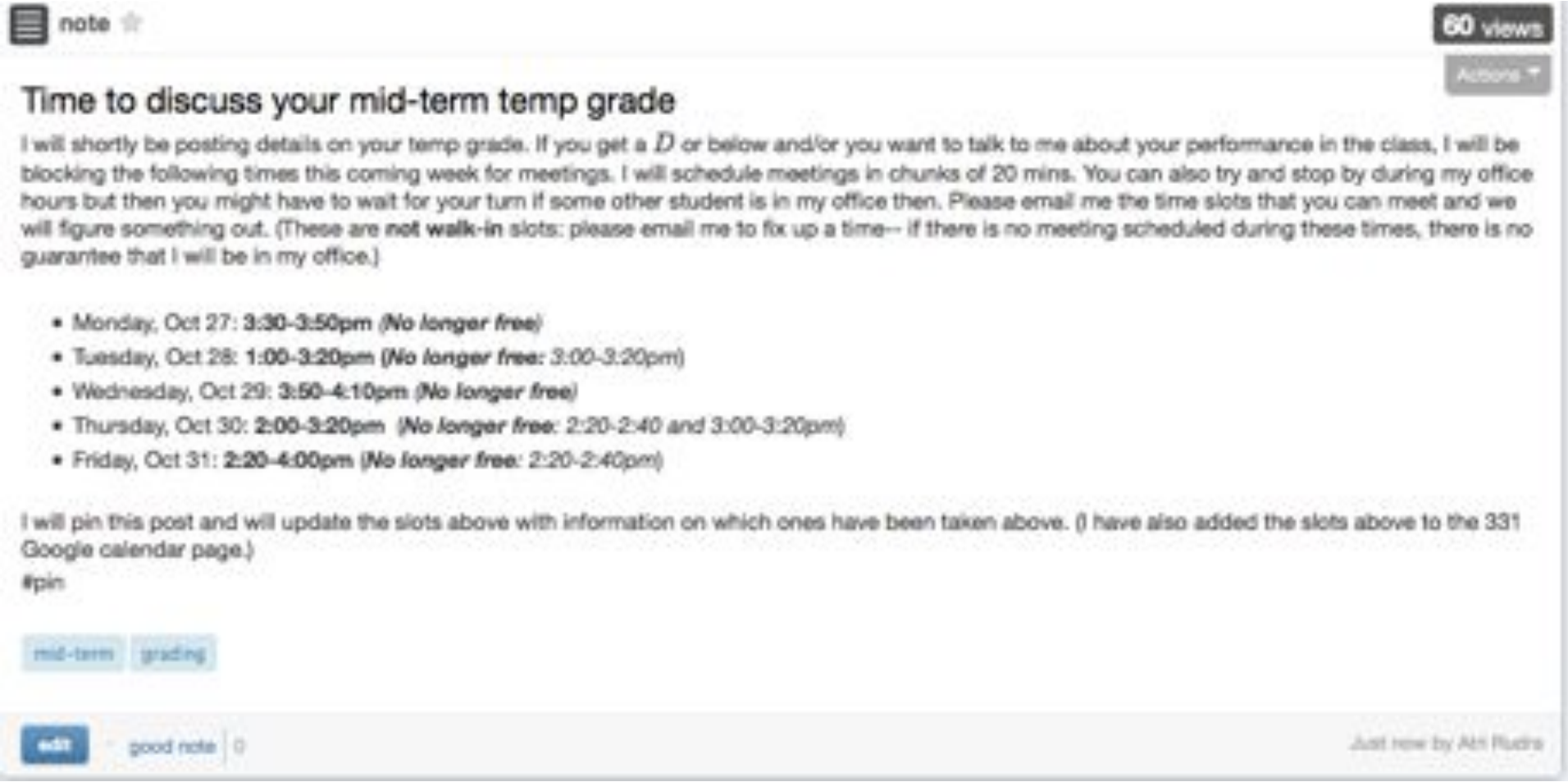
#pin

mid-term grading

edit · good note | 0

20 hours ago by Atri Rudra

One-on-one meetings


note

60 views

Actions

Time to discuss your mid-term temp grade

I will shortly be posting details on your temp grade. If you get a D or below and/or you want to talk to me about your performance in the class, I will be blocking the following times this coming week for meetings. I will schedule meetings in chunks of 20 mins. You can also try and stop by during my office hours but then you might have to wait for your turn if some other student is in my office then. Please email me the time slots that you can meet and we will figure something out. (These are **not walk-in** slots: please email me to fix up a time-- if there is no meeting scheduled during these times, there is no guarantee that I will be in my office.)

- Monday, Oct 27: **3:30-3:50pm** ***(No longer free)***
- Tuesday, Oct 28: **1:00-3:20pm** ***(No longer free:*** *3:00-3:20pm)*
- Wednesday, Oct 29: **3:50-4:10pm** ***(No longer free)***
- Thursday, Oct 30: **2:00-3:20pm** ***(No longer free:*** *2:20-2:40 and 3:00-3:20pm)*
- Friday, Oct 31: **2:20-4:00pm** ***(No longer free:*** *2:20-2:40pm)*

I will pin this post and will update the slots above with information on which ones have been taken above. (I have also added the slots above to the 331 Google calendar page.)

#pin

mid-term grading

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Just now by Abi Rudra

Dijkstra's shortest path algorithm

$d'(v) = \min_{e=(u,v) \text{ in } E,\ u \text{ in } S} d(u)+l_e$

Input: Directed $G=(V,E)$, $l_e \geq 0$, s in V

$S = \{s\}$, $d(s) = 0$

While there is a v not in S with (u,v) in E, u in S

Pick w that minimizes $d'(w)$

Add w to S

$d(w) = d'(w)$

At most n iterations

$O(m)$ time

$O(mn)$ time bound is trivial

$O(m \log n)$ time implementation is possible

Reading Assignment

Sec 4.4 of [KT]

Building a fiber network

Lay down fibers to connect n locations

All n locations should be connected

Laying down a fiber costs money

What is the cheapest way to lay down the fibers?

Today's agenda

Minimum Spanning Tree (MST) Problem

Greedy algorithm(s) for MST problem

Kruskal's Algorithm

Joseph B. Kruskal

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

$T = \emptyset$

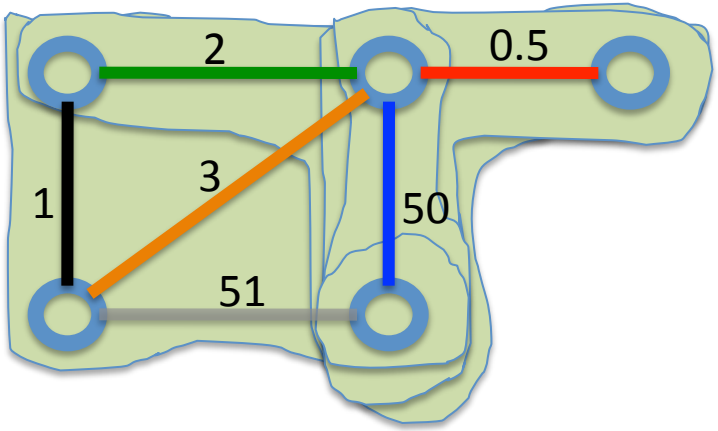
Sort edges in increasing order of their cost

Consider edges in sorted order

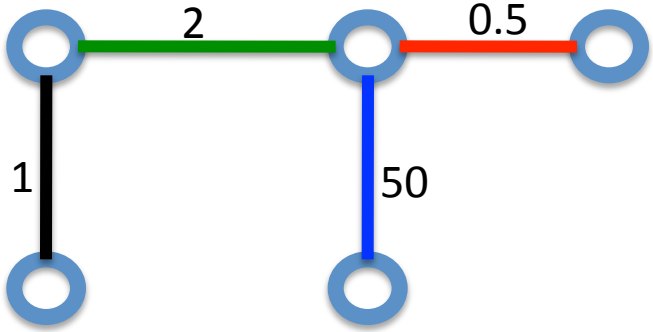
If an edge can be added to T without adding a cycle then add it to T

Prim's algorithm

Similar to Dijkstra's algorithm



Robert Prim



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

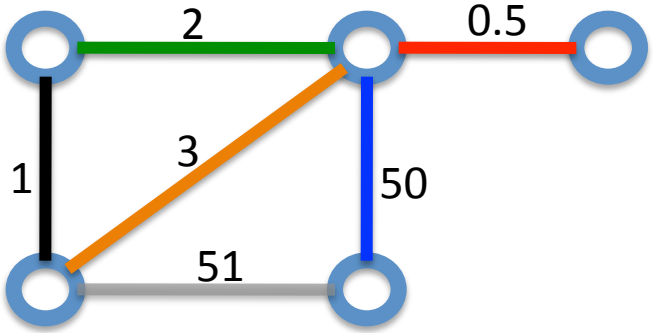
$S = \{s\}$, $T = \emptyset$

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

Reverse-Delete Algorithm



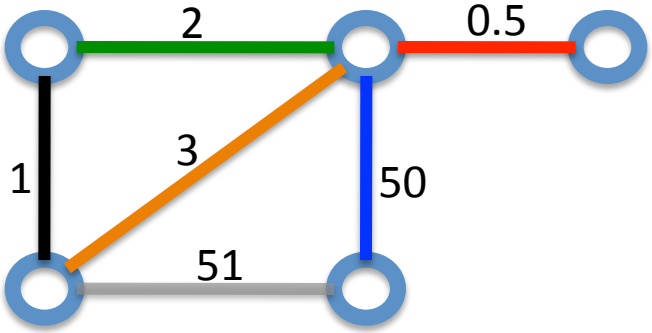
Input: G=(V,E), $c_e > 0$ for every e in E

T = E

Sort edges in decreasing order of their cost

Consider edges in sorted order

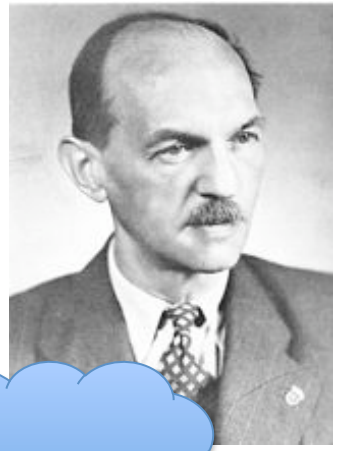
If an edge can be removed T without disconnecting T then remove it



(Old) History of MST algorithms

1920: Otakar Borůvka

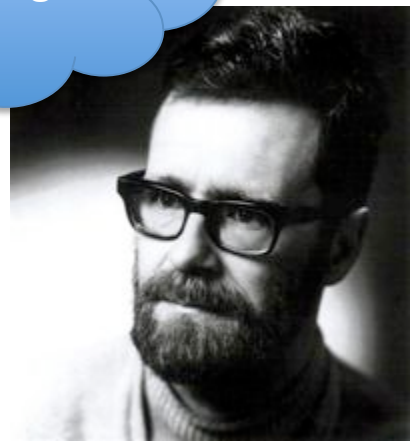
1930: Vojtěch Jarník



Same algo!

1956: Kruskal

1957: Prim



1959: Dijkstra