

Lecture 26

CSE 331

Oct 29, 2014

Online OH tonight @9pm

note ☆ 0 views

Online OH #6 tomorrow at 9pm

We will resume online OH tomorrow at 9pm. Please tag all your questions with the folder 'onlineoh6'

onlineoh6

[edit](#) · [good note](#) 0 Just now by Abri Rudra

Mini project report due in 1 week

note stop following 68 views

Mini Project Report due Nov 5

A gentle reminder about the upcoming deadline of 11:59pm to email me your group's project report. For more details see:

<http://www.cse.buffalo.edu/~atri/courses/331/handouts/mini-project.pdf>

(The link is also available from the "Resources" tab.)

#pin

mini_project

edit good note 4 days ago by Atri Rudra

Kruskal's Algorithm

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



Joseph B. Kruskal

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

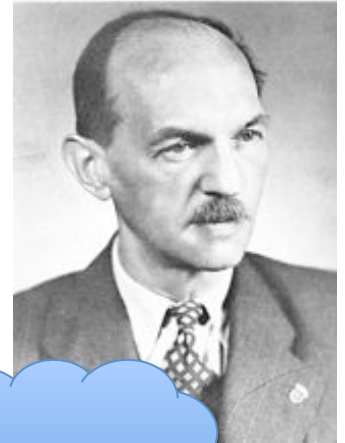
Add w to S , e to T

(Old) History of MST algorithms

1920: Otakar Borůvka



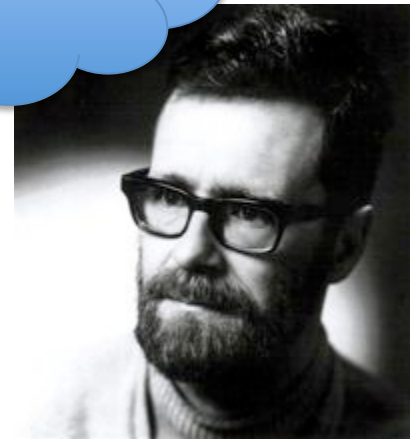
1930: Vojtěch Jarník



1956: Kruskal



1957: Prim

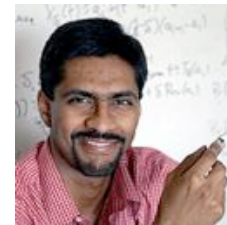
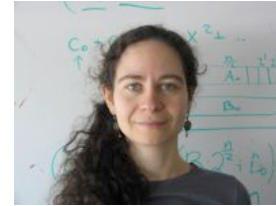


1959: Dijkstra

Some modern Algo Researchers

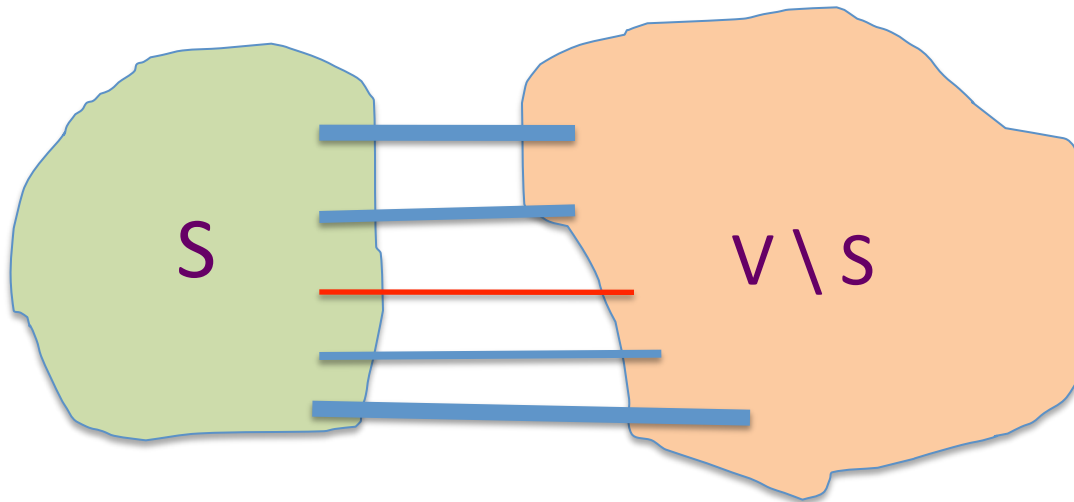


Can you guess the common link?



Cut Property Lemma for MSTs

Condition: S and $V \setminus S$ 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