

DM538 – Ugeseddel 12

Uge 49

Forelæsning tirsdag d. 3/12

- Afsnit 13.3: Coupon Collector's Problem
- Afsnit 13.4: MAX 3-SAT
- Afsnit 13.5: Median finding and Quicksort

Øvelser fredag d. 6/12

1. Recall that the contraction algorithm of Section 13.2 has a probability of at least $1/\binom{n}{2}$ for finding a *global minimum cut*. Suppose that, at each step of the algorithm, instead of choosing a random edge for contraction we choose two vertices at random and coalesce them into a single vertex (as if we were contracting an edge between them).
Show that there are graphs for which the probability that this modified algorithm finds a minimum cut is exponentially small.
2. This exercise is about finding a *global minimum cut in a weighted graph*. In a weighted graph, the weight of a cut (A, B) is the total weight of the edges between A and B , and a minimum cut is a cut of minimum weight.
How would you adapt the contraction algorithm to this problem?
3. This exercise is about *coloring the vertices of a graph*. There are 3 colors available, and the aim is to maximize the number of edges that have endpoints with different colors.
Give a randomized algorithm that colors the vertices such that, in expectation, $2/3$ of the edges will have endpoints with different colors.
4. Argue that, in principle, you can always convert a Las Vegas algorithm to a Monte Carlo algorithm, but you cannot necessarily convert a Monte Carlo algorithm to a Las Vegas algorithm.

Instruktorater

Hjælp dine medstuderende, dygtiggør dig selv og få penge for det. Søg i dag!

Der er ofte gode muligheder for at få et instruktat, selvom man ikke er langt henne i studiet. Se nærmere information her.

Instruktorer, der ifølge deres seneste ansættelseskontrakt allerede er ansat for foråret 2014, skal naturligvis ikke søge på stillingsopslaget. I stedet indleverer de ønsker om

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undervisning i foråret 2014, liste over tidligere undervisningserfaring, samt udskrift af eksamensprotokol til IMADA's sekretariat.

Der ydes hjælp til nye instruktører i form af møder og diskussion i et mindre omfang.

Hvis du har spørgsmål, så henvend dig gerne på IMADA.

ANSØGNINGSFRIST: 5. december 2013