

Randomized Algorithms (DM839) — Ugeseddel 10

NB: new schedule for 4th quarter We now have a new (4. quarter schedule). As I will hand out the exam problems already Wednesday 9 and not Thursday as previously announced), there will be no classes in the period April 10 to May 12 inclusive.

Note that, again contrary to previous message, we will have class Monday April 7 at 8.15!

Stuff covered in week 14 Sections 5 and 6 in the above paper by Alon et al.

Classes Monday, April 7, 2014 We will discuss the following exercises

- MU 6.3 and 6.14
- MU 7.6
- Consider the weather during a number of days as a stochastic process with the only possible states 0 : sun and 1 : rain. We assume for simplicity that the process is a Markov chain with transition matrix

$$P = \begin{pmatrix} 0.7 & 0.3 \\ 0.2 & 0.8 \end{pmatrix}$$

- (a) Find the probability that a rainy day is followed by a sunny.
 - (b) Formulate in words the event $X_{62} = 1$.
 - (c) Find the conditional probability $Pr(X_{62} = 1 | X_{61} = 0)$.
 - (d) Find the probability that a rainy day is followed by two sunny days.
 - (e) Find $Pr(X_{62} = 1 | X_{60} = 0)$.
 - (f) If Friday is sunny, what is the probability that the next following Sunday is also a sunny day?
- The weather changes at a tourist resort from one day to the next can somewhat simplified be described as a Markov chain with the three states:
 E_1 : sun, E_2 : clouds, E_3 : rain.

Using weather statistics of the area the following transition probability matrix has

been estimated: $P = \begin{pmatrix} 0.6 & 0.2 & 0.2 \\ 0.3 & 0.5 & 0.2 \\ 0.7 & 0.0 & 0.3 \end{pmatrix}$

A vacationer intends to visit the resort during the period December 24-26. Under the assumption that there is still a lot of time before Christmas, derive the probability

- (a) that there will be three sunny days in a row;
- (b) of no rain at least during the first two days.

- MU 13.1 and 13.5

Classes Wednesday April 9, 2014 We will discuss the formulation of the exam problems and what I expect from you. The problems will be made available on the home page sometime Tuesday.