
Lecture

There is no lecture today but Anders Roy Christiansen will be available for question about the programming competition and CodeJudge.

Programming competition and mandatory assignments

The programming competition is now on. There will be a prize for the best three teams. You can find the rules and the description of the programming competition on the webpage.

Remember that you need to pass 3 of the mandatory assignments in order to be allowed to participate in the exam and pass two CodeJudge exercises (the programming competition can count as one fo these).

Exercises

Finite automata Solve CLRS 32.3-1 and 32.3-4.

KMP Solve

- CLRS 32.4-1, and draw the corresponding automaton with failure links (see slides).
 - Explain how to determine the occurrences of pattern P in the text T by examining the π function for the string $P\$T$, where $\$$ is a new character not in the alphabet.
 - CLRS 32.4-7.
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String matching with gaps This exercise is about string matching with gap characters as described in CLRS exercise 32.1-4. Solve the following exercises.

1. CLRS 32.3-5
 2. Give an algorithm to find an occurrence of a pattern P containing gap characters in a text T in time $O(n + m)$. That is, preprocessing time + matching time should be $O(n + m)$.
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Preprocessing of the string matching automaton Solve CLRS 32.4-8.

Mandatory Assignment

Q1: String automaton Draw the finite automata for the string ATCATACA.

Q2: KMP Compute the prefix function as used in the Knuth-Morris-Pratt algorithm for the string ATCATACA. Also draw the corresponding automaton with failure links.

Q3: Circular strings A circular string of length n is a string in which character n is considered to precede character 1. *Example:* The strings `rc`, `arc`, `arca` and `carcar` are all substrings of the cyclic string `car`.

Give an algorithm to determine whether a string P_1 is a substring of a *circular* string P_2 . Analyze the asymptotic running time of your algorithm. Remember to argue, that your algorithm is correct.