

Today Time complexity; CYK algorithm. §§ 7.{1,2}.

Next class More time-complexity; NP completeness. §§ 7.*.

Reminders Newsgroup. Homework. Posters and portfolios.

1. List the members of your group below. Underline your name.

2. Trace Euclid's algorithm to compute the GCD of 3838 and 19302.

3. Prove or disprove each: The class P is closed under

(a) complement.

(b) union.

(c) concatenation.

4. The operation of the algorithm of Theorem 7.16 (CYK) on the grammar on the left below and string 000#111 is depicted by the table on the right.

$S_0 \rightarrow \# N_2N_0$	$i \setminus j$	1	2	3	4	5	6	7
$B \rightarrow \#$	1	$\{N_2\}$	\emptyset	\emptyset	\emptyset	\emptyset	\emptyset	$\{S_0\}$
$N_0 \rightarrow S_0N_4$	2		$\{N_2\}$	\emptyset	\emptyset	\emptyset	$\{S_0\}$	$\{N_0\}$
$N_2 \rightarrow 0$	3			$\{N_2\}$	\emptyset	$\{S_0\}$	$\{N_0\}$	\emptyset
$N_4 \rightarrow 1$	4				$\{S_0, B\}$	$\{N_0\}$	\emptyset	\emptyset
	5					$\{N_4\}$	\emptyset	\emptyset
	6						$\{N_4\}$	\emptyset
	7							$\{N_4\}$

Depict a similar table for string $a+a*(a+a)$ and grammar:

```
S0 -> N19 N0 | S0 N1 | a | term N2
N0 -> S0 N10
N1 -> N11 term
factor -> N19 N0 | a
term -> N19 N0 | a | term N2
```

```
N10 -> )
N11 -> +
N12 -> *
N19 -> (
N2 -> N12 factor
```