

**Today** HW05 due. The class P; CYK algorithm. §7.2.

**Next class** The class NP, and NP-completeness. §§7.3–4. Quiz next week.

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 following grammar with and string 000#111 is depicted by the table on the right below.

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

Depict a similar table for the operation of the algorithm on string  $a+a*(a+a)$  for the grammar:

$S_0 \rightarrow N_{19} N_0 \mid S_0 N_1 \mid a \mid \text{term } N_2$	$N_{10} \rightarrow )$
$N_0 \rightarrow S_0 N_{10}$	$N_{11} \rightarrow +$
$N_1 \rightarrow N_{11} \text{ term}$	$N_{12} \rightarrow *$
$\text{factor} \rightarrow N_{19} N_0 \mid a$	$N_{19} \rightarrow ($
$\text{term} \rightarrow N_{19} N_0 \mid a \mid \text{term } N_2$	$N_2 \rightarrow N_{12} \text{ factor}$