

## Seminar 7

### 1.1 Gramatici de toate felurile (GIC si gram. care nu sint GIC)

1. Sa se dea cate o gramatica care genereaza limbajele:

1.  $L = \{ww \mid w \in \{a, b\}^*\}$
2.  $L = \{wxw \mid w \in \{a, b\}^+, x \in \{a, b\}^*\}$
3.  $L = \{a^n b^n c^n \mid n \in \mathbf{N}^*\}$
4.  $L = \{a^n b^n c^n d^n \mid n \in \mathbf{N}^*\}$
5.  $L = \{a^{2^n} \mid n \in \mathbf{N}\}$  a apare de  $2^n$  ori
6.  $L = \{w \mid w \in \{a, b\}^*, nr_a(w) = nr_b(w)\}$
7.  $L = \{w \mid w \in \{a, b, c\}^*, nr_a(w) = nr_b(w) = nr_c(w)\}$
8.  $L = \{w \mid w \in \{a, b, c\}^*, nr_a(w) + nr_b(w) = nr_c(w)\}$
9.  $L = \{a^n b^n c^m d^m \mid n, m \in \mathbf{N}\}$
10.  $L = \{a^n b^m c^m d^n \mid n, m \in \mathbf{N}\}$
11.  $L = \{a^n b^m c^k \mid n, m, k \in \mathbf{N}, (n=m) \text{ sau } (m=k)\}$
12.  $L = \{a^n b^m c^k \mid n, m, k \in \mathbf{N}, m+n = k\}$
13.  $L = \{w \in \{a, b\}^* \mid w \text{ starts and ends with the same symbol}\}$

*de facut cel putin 1, 3, 5, 9*

### 1.2 GIC: a fi sau a nu fi ambigua ☺

1. Sa se arate ca gramaticile urmatoare sint ambigue si sa se gaseasca o gramatica echivalenta neambigua.

- a)  $S \rightarrow aS \mid Sb \mid c$
- b)  $S \rightarrow \text{if } b \text{ then } S \text{ else } S \mid \text{if } b \text{ then } S \mid \text{stmt}$
- c)  $S \rightarrow (S \mid S) \mid (S) \mid 1$
- d)  $S \rightarrow SS \mid a$
- e)  $A \rightarrow A \alpha A \mid a$
- f)  $A \rightarrow \alpha A \mid \alpha A \beta \mid a$

**Cateva idei de rezolvare:**

**pt. sectiunea 1.1 : Gramatici de toate felurile , enuntul**

*Sa se dea cate o gramatica care genereaza limbajele*

(Ma bucur daca le verifici si tu in caz ca mi-a scapat ceva; sint tare grabita acum ☺)

**Problema**

$$L = \{ ww \mid w \in \{a, b\}^* \}$$

$S \rightarrow aSB$

$S \rightarrow bSA \quad \Rightarrow a..b \text{ .. in oglinda cu } A..B..$

Dupa care inversam secv. A B

Le punem sa vina pana la mijloc (D)

Trecand numai peste cele deja facute terminale (~inversate)

$S \rightarrow D$

$aB \rightarrow Ba$

$aA \rightarrow Aa$

$bA \rightarrow Ab$

$bB \rightarrow bb$

$DA \rightarrow Da$

$DB \rightarrow Db$

$D \rightarrow \text{eps}$

**Problema**

$$L = \{ a^{2^n} \mid n \in \mathbb{N} \} \quad \text{a apare de } 2^n \text{ ori}$$

$S \rightarrow LaR$

$L \rightarrow LD$

$DR \rightarrow R$

$Da \rightarrow aaD$

$L \rightarrow \text{eps}$

$R \rightarrow \text{eps}$

A trece de la L(left) pana la R(right) dubland a deja existenti