

LFTC - SEMINAR 4

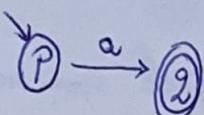
gr. regulară = gr. în care orice producție are una din formele:

1. $A \rightarrow aB$ sau $A \rightarrow b$ unde $A, B \in N$
 $a, b \in \Sigma$

2. dacă $S \rightarrow E \in P$ atunci S nu
mai apare în dreptul

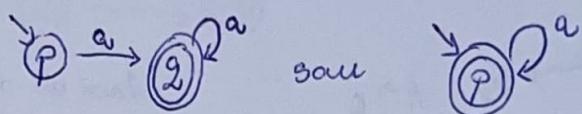
I) Pentru urm. limbaje, date AF care le acceptă, apoi date o gramatică echivalentă.
Este regulară? Dacă nu, date o gr. regulară echivalentă.

a) $L_1 = \{a^3\}$



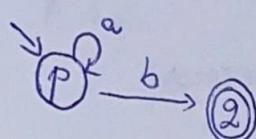
$A \rightarrow a$ (gr. regulară)

b) $L_2 = \{a^m | m \in \mathbb{N}\}$



$\begin{cases} S \rightarrow E \\ S \rightarrow aS \end{cases}$ gr. nu este regulară

c) $L_3 = \{a^m b | m \in \mathbb{N}\}$

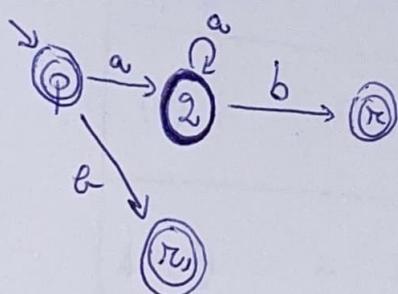


$A \rightarrow aA$

$A \rightarrow b$ gr. regulară

$\begin{cases} S \rightarrow E \\ S \rightarrow aA \\ A \rightarrow aA \\ A \rightarrow a \\ S \rightarrow a \end{cases}$ gr. regulară (S nu poate să fie în dreptul)

d) $L_4 = \{e^m a^n b^m | m, n \in \mathbb{N}\}$



$S \rightarrow e$

$S \rightarrow e$

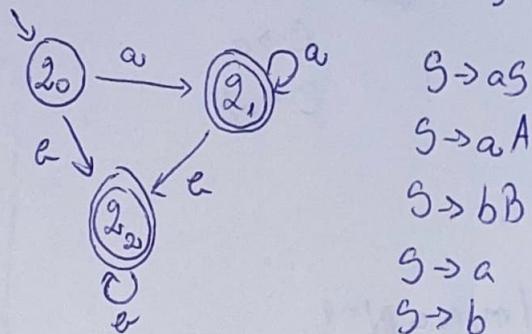
$S \rightarrow aP$

$P \rightarrow e$

$P \rightarrow aP$

gr. regulară

e) $L_5 = \{a^m b^n | m, n \in \mathbb{N}, m + n > 0\}$



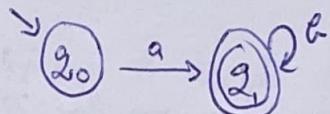
$A \rightarrow a$

$B \rightarrow bB$

$B \rightarrow b$

gr. regulară

f) $L_6 = \{ab^m | m \in \mathbb{N}\}$



$A \rightarrow aB$

$A \rightarrow a$

$B \rightarrow bB$

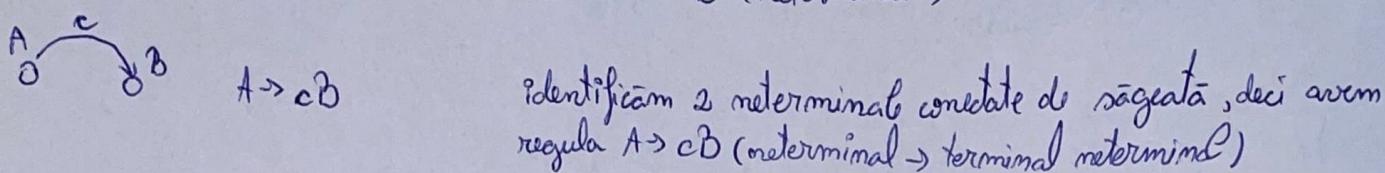
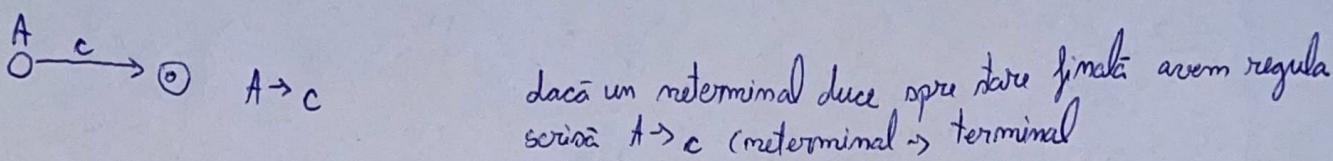
$B \rightarrow b$

gr. neregulară (din cauza $B \rightarrow bB$)

IDK

2 Descrie construcția generată a unei gram. regulare echivalente cu un AT dat.

- ① $S \rightarrow \epsilon$ stăru initială + finală
- ② N dacă ieră săgeată avem metternimale
- ③ S, t dacă este st. initială + finală și vine o săgeată avem mereu de 2 metternimale

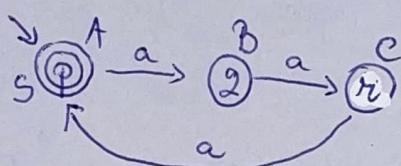


3 Pentru urm. limbaje date o gramatică regulară care le generează

a) $L = \{a^{3m} | m \in \mathbb{N}^*\}$

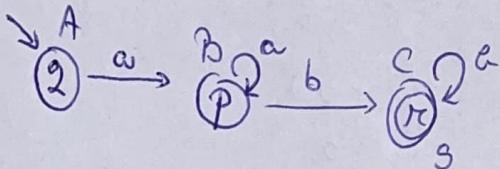
$$\begin{array}{l} A \rightarrow aB \\ B \rightarrow aC \\ C \rightarrow a \\ C \rightarrow aD \\ D \rightarrow aB \end{array}$$

$$\begin{array}{l} A \rightarrow aB \\ \text{sau} \\ B \rightarrow aC \\ C \rightarrow a \\ C \rightarrow aT \end{array}$$



$$\begin{array}{l} A \rightarrow \epsilon \\ A \rightarrow aB \\ B \rightarrow aC \\ C \rightarrow aS \\ S \rightarrow aB \\ C \rightarrow a \end{array}$$

c) $L = \{a^m b^n | m, n \in \mathbb{N}^*\}$



$$A \rightarrow aB$$

$$B \rightarrow aB$$

$$B \rightarrow bC$$

$$C \rightarrow bC$$

$$C \rightarrow b$$

$$B \rightarrow b$$

?? asta nu pare regulară ??

4 Pentru urm. gramatici regulate descrieți limbajul generat. Dati AF echivalent.

a) $A \rightarrow aA$

$A \rightarrow b$

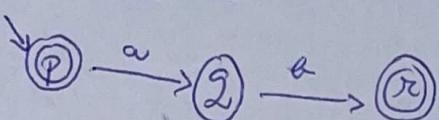
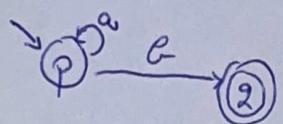
$$L = \{a^m b | m \in \mathbb{N}\}$$

b) $S \rightarrow S$

$S \rightarrow aS$

$A \rightarrow b$

$$L = \{S, ab\}$$



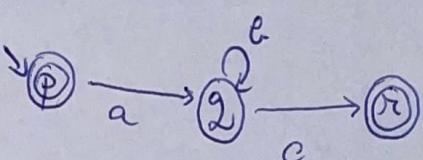
c) $S \rightarrow S$

$S \rightarrow aA$

$A \rightarrow bA$

$A \rightarrow c$

$$L = \{S \cup ab^m c | m \in \mathbb{N}\}$$



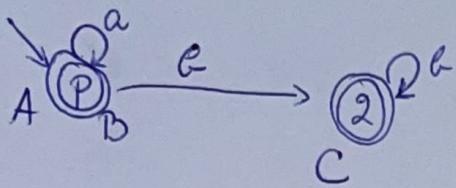
5 Descrieți construcția generală a unui AF echivalent cu o gram. regulară dată.

GR \longrightarrow AF

| | | |
|--------------------|---------------|--|
| $S \rightarrow S$ | \Rightarrow | |
| N | \Rightarrow | |
| $A \rightarrow cB$ | \Rightarrow | |
| $A \rightarrow c$ | \Rightarrow | |

6 Pt. următoarele limbiage dati AF căre le acceptă. Apoi dati gr. regulată echivalentă, aplicând algoritmul (general) de construire. Apoi dati AF echiv. cu gr. regulată aplicând alg. general de construire

b) $L = \{a^m b^m \mid m, n \in \mathbb{N}\}$



$$A \rightarrow \epsilon$$

$$A \rightarrow a$$

$$C \rightarrow a$$

$$A \rightarrow b$$

$$C \rightarrow b$$

$$A \rightarrow aC$$

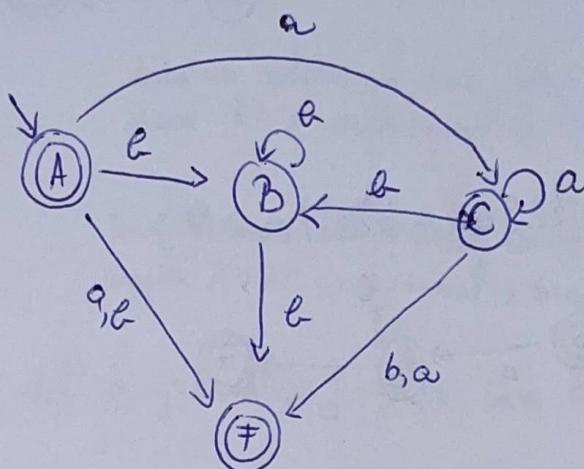
$$C \rightarrow aC$$

$$A \rightarrow bB$$

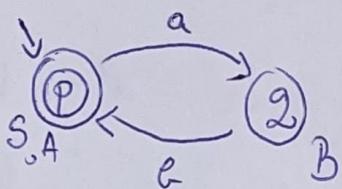
$$C \rightarrow bB$$

$$B \rightarrow b$$

$$B \rightarrow bB$$



a) $L = \{a^{2m} \mid m \in \mathbb{N}\}$



$$S \rightarrow \epsilon$$

$$A \rightarrow aB$$

$$S \rightarrow aB$$

$$B \rightarrow aA$$

$$B \rightarrow a$$