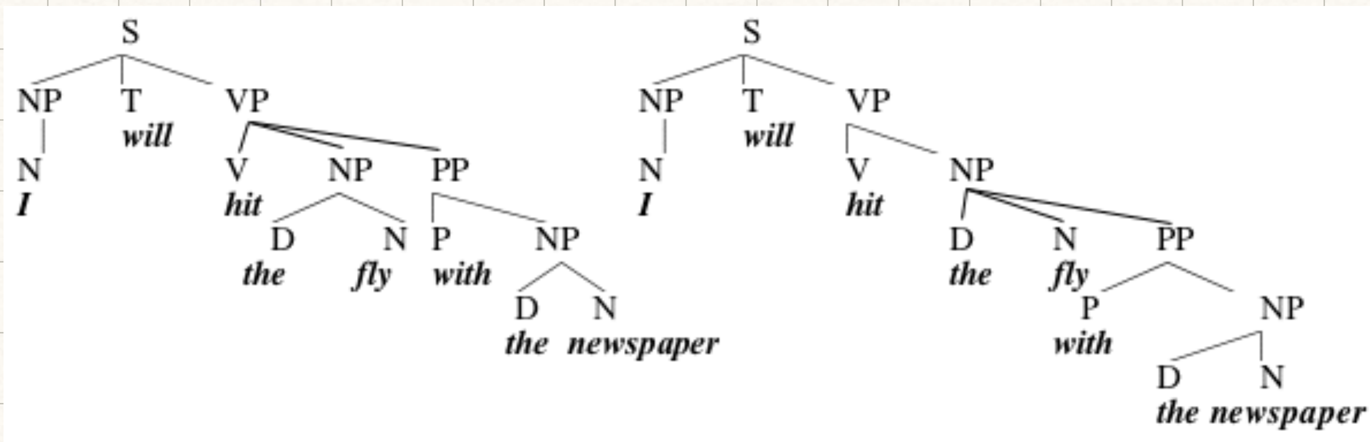
Лекция 2



$S \Rightarrow NP\ VP$

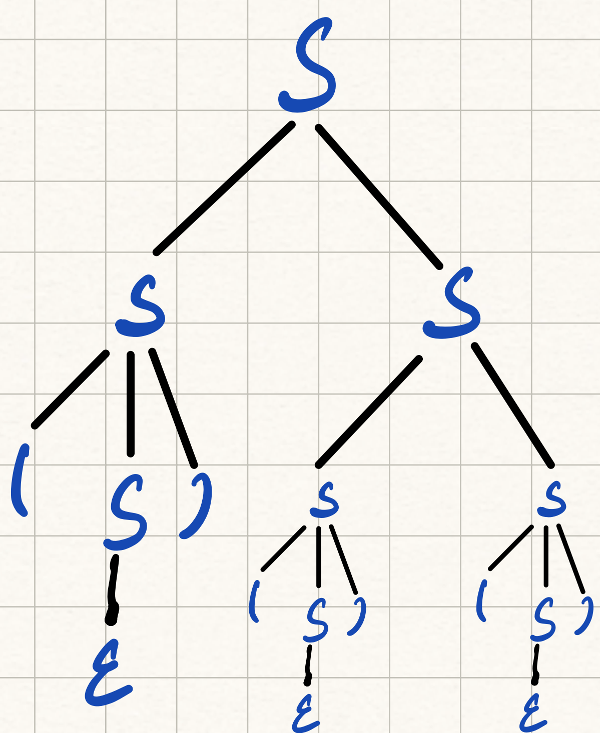
$S \to aSb \mid SS \mid \varepsilon$

$S \to (S) \mid SS \mid \varepsilon$ $\quad D_1$

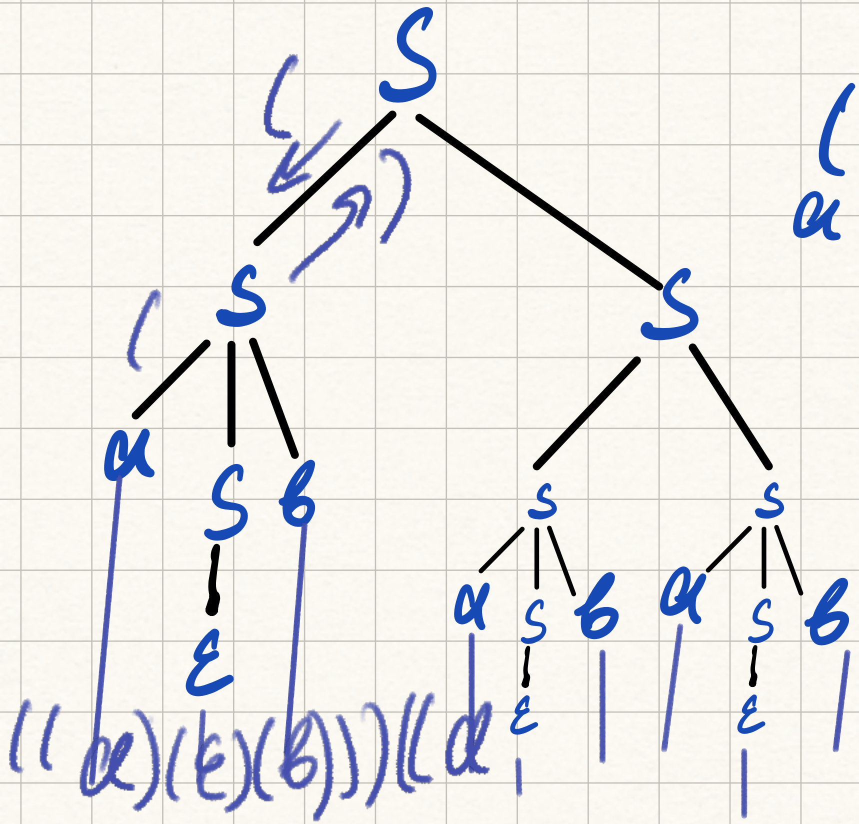
ε – П.С.В, $\quad S$ – П.С.В $\Rightarrow$ (S), SS тоже П.С.В

$S \to [S] \mid (S) \mid SS \mid \varepsilon$

$S \to (_1 S)_1 \mid (_2 S)_2 \mid \ldots \mid (_n S)_n \mid$
$SS \mid \varepsilon$ $\quad D_n$



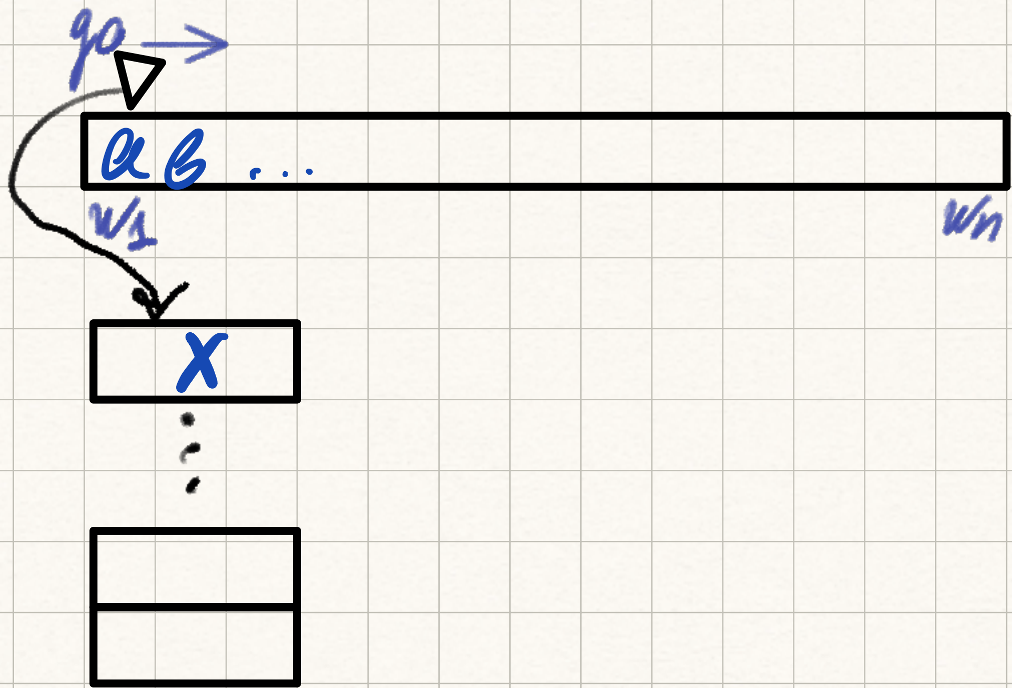
$(\,)(\,)(\,)$



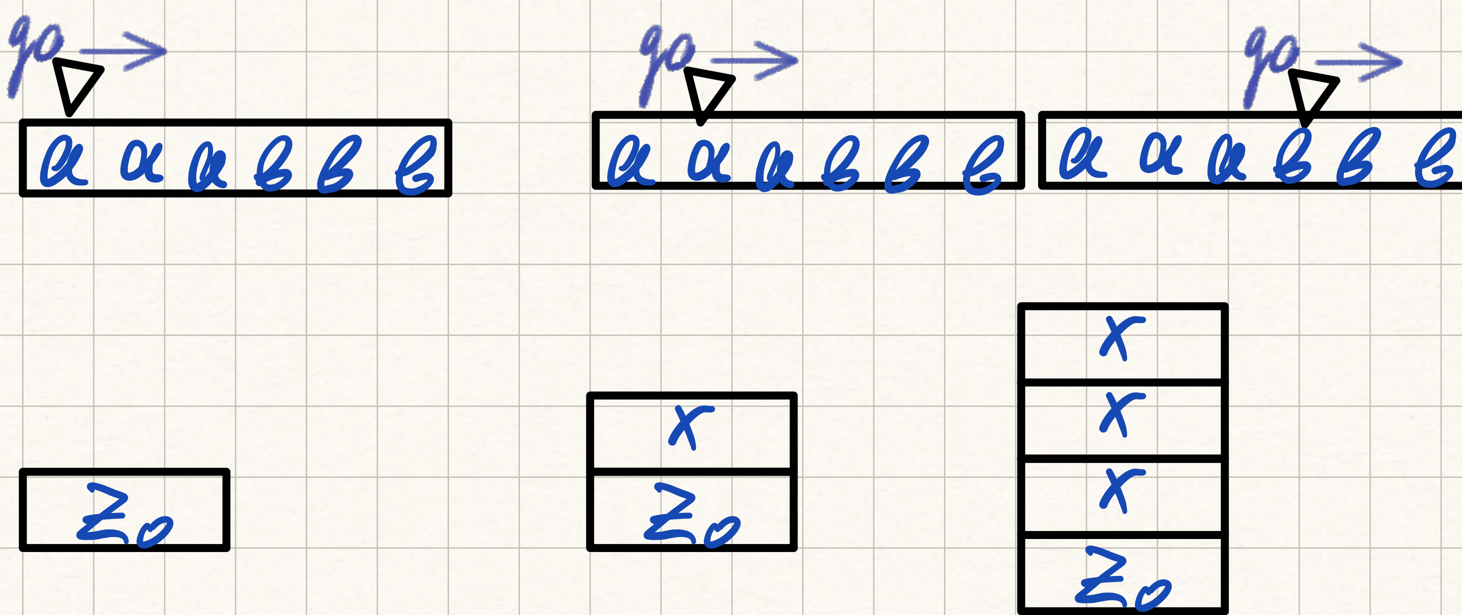
( ) ( ) ( )

a b a b a b

МП - Автоматы

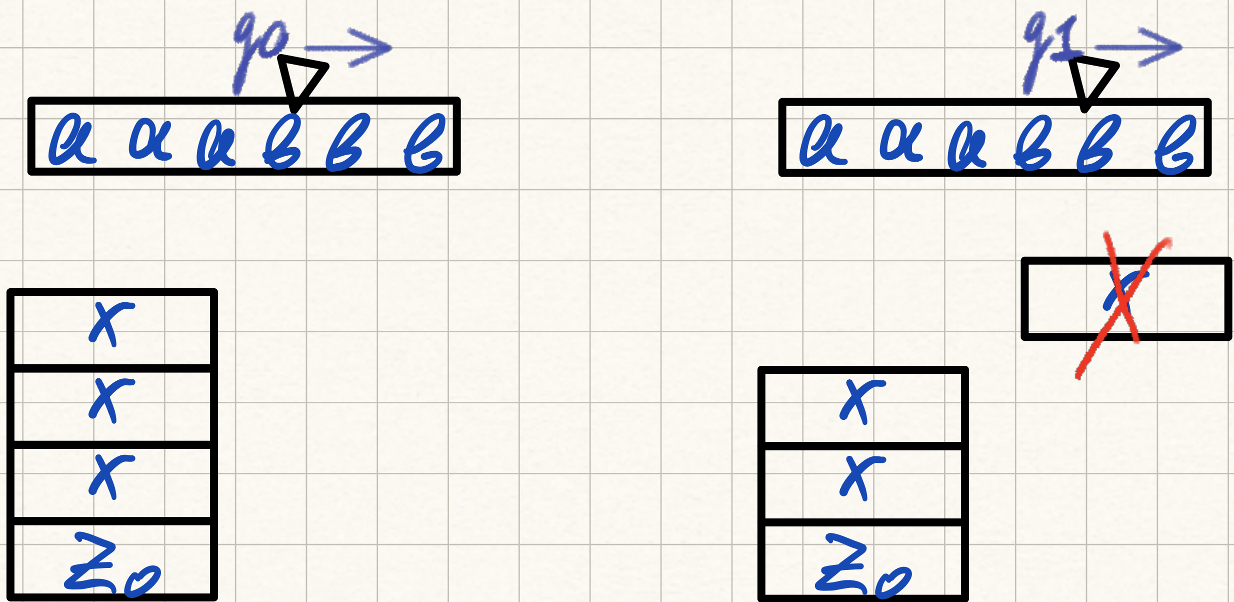


$L = \{a^n b^n : n \geq 1\}$

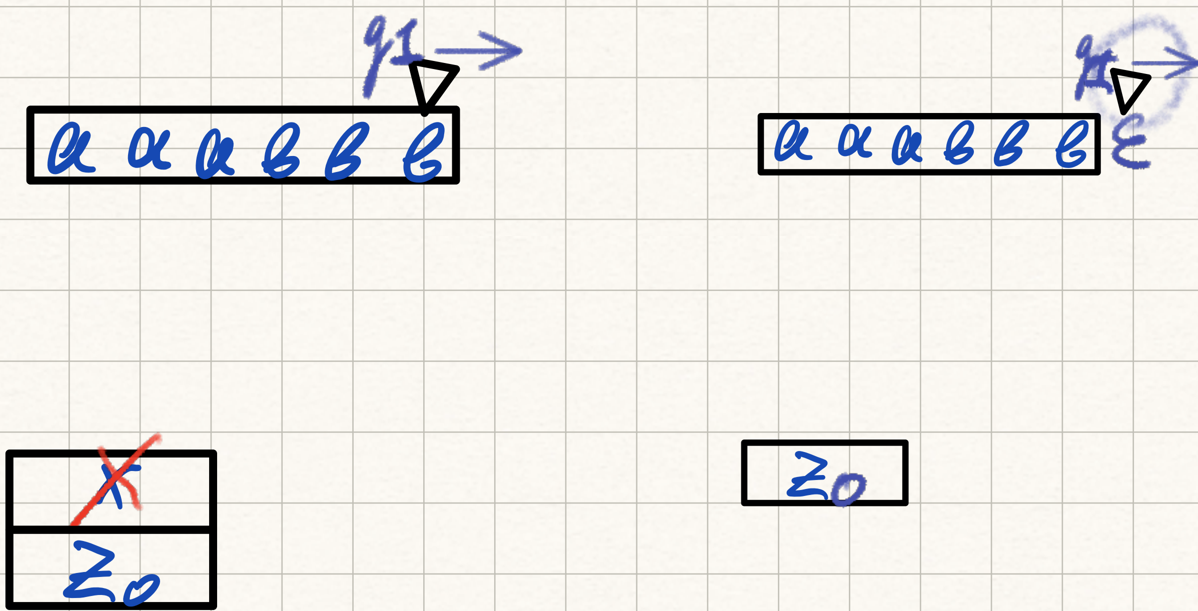


$(q_0, a, Z_0) \vdash (q_0, XZ_0)$

$$(q_0, a, X) \vdash (q_0, XX)$$



$$(q_0, b, X) \vdash (q_1, \varepsilon)$$



$$(q_1, \varepsilon, Z_0) \vdash (q_f, Z_0)$$

Определение

$$M(\underset{\text{алфавит входа}}{\Sigma}, \overset{\text{алф. стека}}{\Gamma}, \overset{\text{сост}}{Q}, \underset{\text{нач. сост.}}{q_0 \in Q}, z_0 \in \Gamma, \underset{\text{прин. сост}}{F \subseteq Q}, \underset{\text{отн. ф-ция перехода}}{\delta})$$

$$\delta : Q \times (\Sigma \cup \{\varepsilon\}) \times \Gamma \to 2^{Q \times \Gamma^*}$$

$$(q_0, a, Z_0) \vdash (q_0, XZ_0)$$

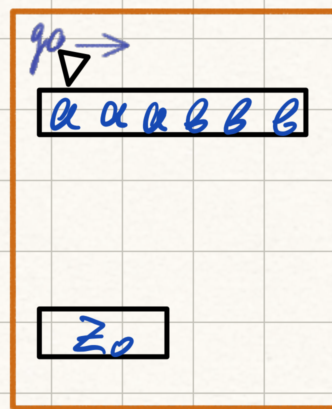
$$(q_0, a, X) \vdash (q_0, XX)$$

$$\boxed{(q_0, XZ_0) \in \delta(q_0, a, Z_0)}$$

$$\delta(q_0, a, X) = \{ (q_0, XX)$$

$$\delta(q_0, a, Z_0) = \{(q_0, XZ_0)\}$$

$$(q_0, a, Z_0) \vdash (q_0, XZ_0)$$



Конфигурации:

$$Q \times \Sigma^* \times \Gamma^*$$

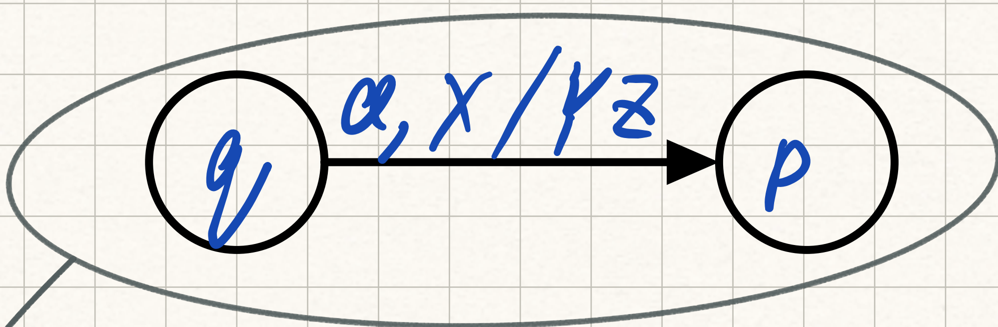
$$(q_0, \underline{a}aabbb, \underline{Z_0}) \vdash$$

$$(q_0, aabbb, XZ_0)$$

рефл. и транз. замык.

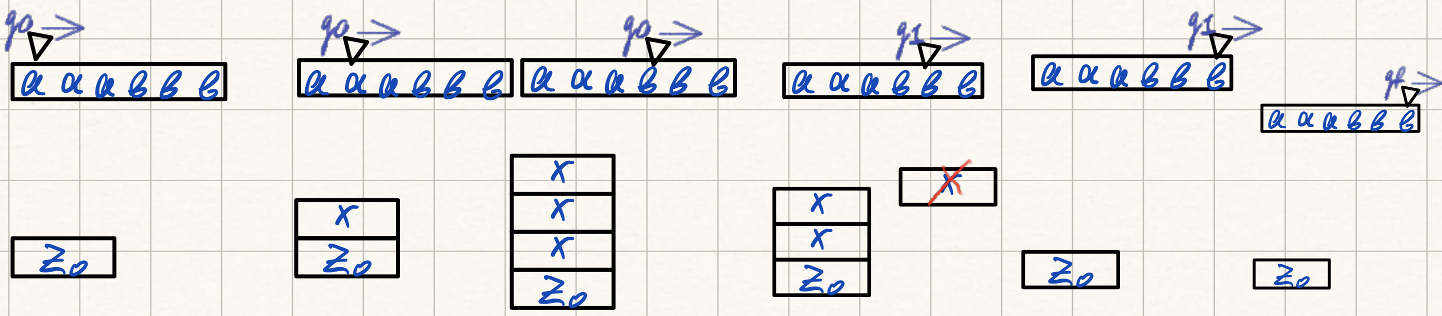
$$(q_0, w, Z_0) \vdash^* (q_f, \varepsilon, \alpha)$$

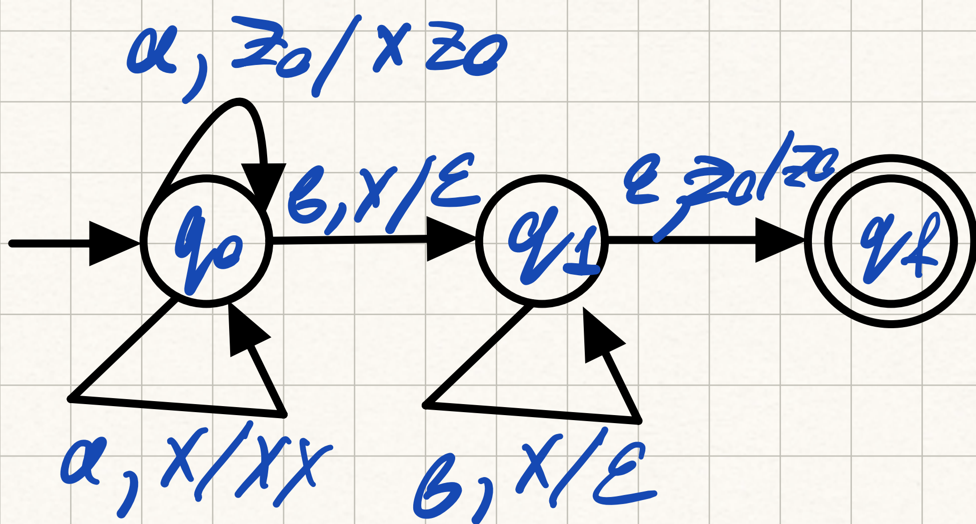
$$q_f \in F, \alpha \in \Gamma^*$$



$$\delta(q, a, X) \ni (p, YZ)$$

$$(q, a, X) \quad (p, YZ)$$





$$\{a^n b^n : n \geq 1\}$$

$$(q_0, a^n b^n, Z_0) \vdash^* (q_0, b^n, X^n Z_0)$$
$$\vdash^* (q_1, \epsilon, Z_0) \vdash (q_f, \epsilon, Z_0)$$

Детерминированные МП-автоматы

1. $\left|\delta(\overset{\in Q}{q}, \underset{\Sigma \cup \{\varepsilon\}}{\sigma}, \overset{\in \Gamma}{X})\right| \le 1$

2. если $\delta(q, \varepsilon, X) \neq \varnothing$,
то $\forall \sigma \in \Sigma$:
$$\delta(q, \sigma, X) = \varnothing$$

МП-автомат детерм.,
если $\forall (q, u, \alpha)$

достиж из нач., т.е.

$\exists w: (q_0, w, Z_0) \vdash^*$

$\vdash^* (q, u, \alpha)$

опр. $\leq$ шага

$(q, u, \alpha) \vdash (q', u', \alpha')$

если $(q, u, \alpha) \vdash (p, v, \beta)$,

то $p = q'$, $v = u'$, $\beta = \alpha'$

1. Автомат допускает по F

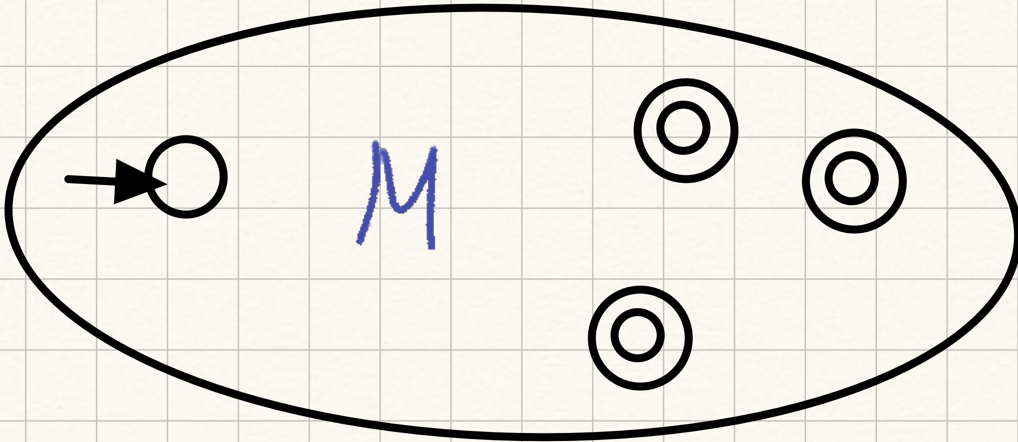
$$(q_0, w, Z_0) \vdash^* (q_f, \varepsilon, \alpha)$$

F

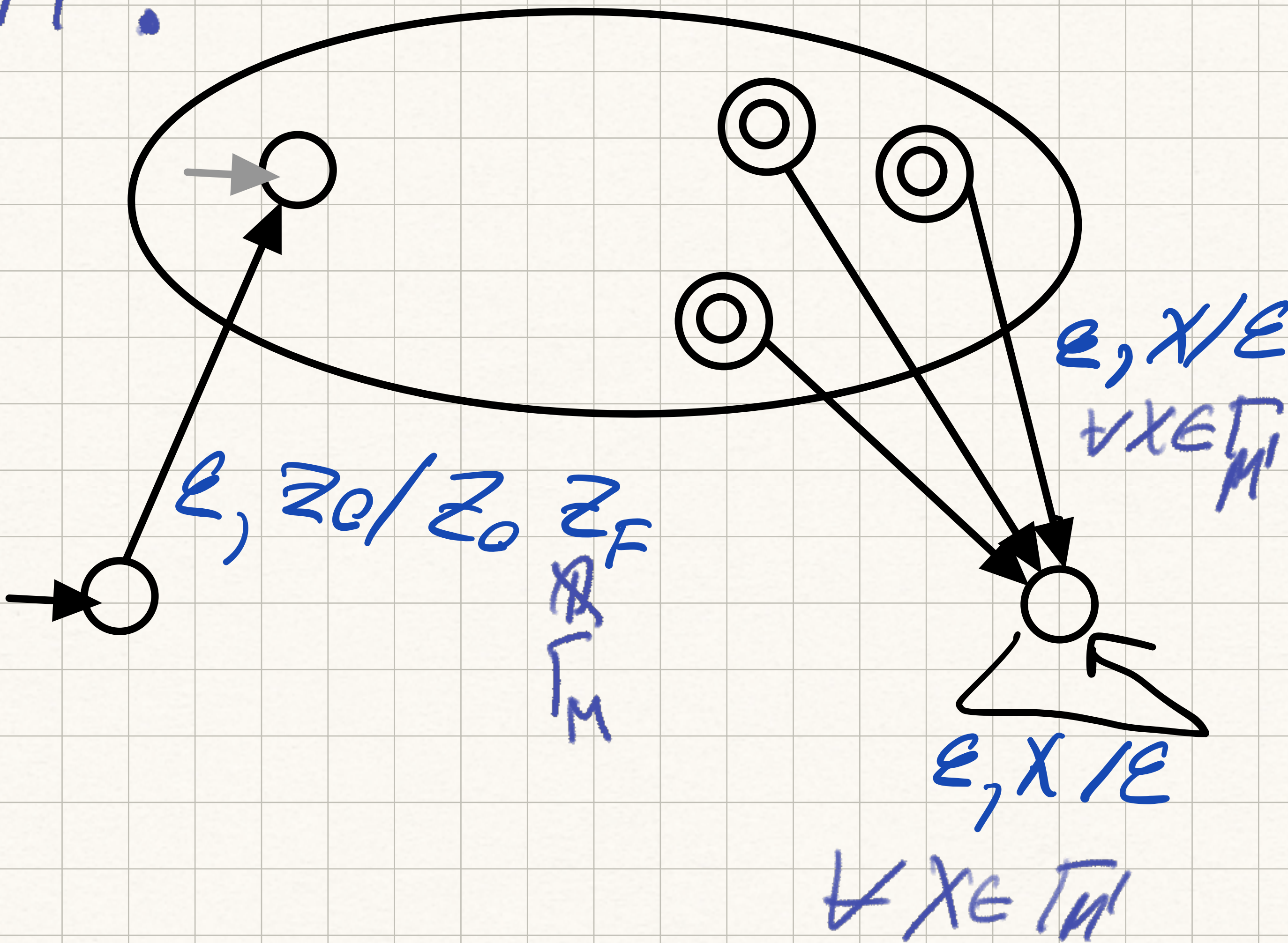
2. Автомат допускает по пустому стеку

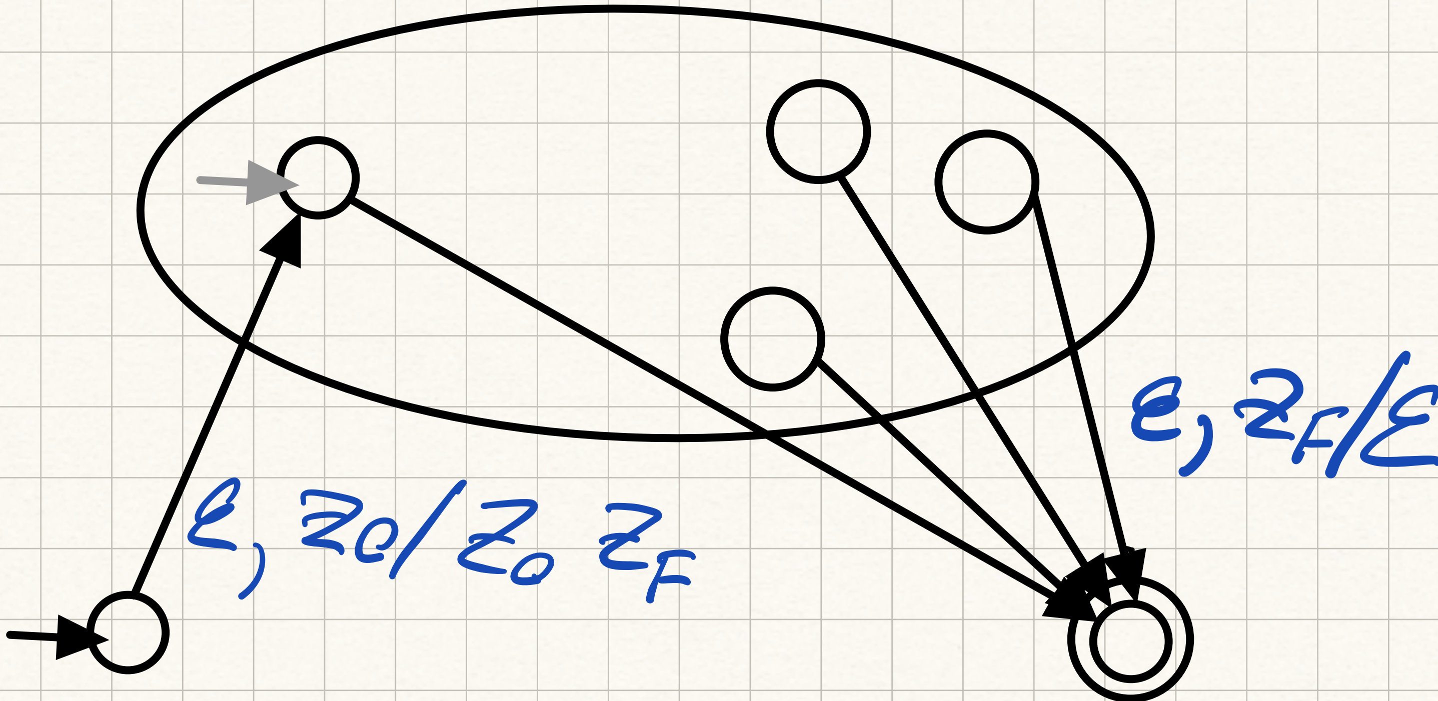
$$(q_0, w, Z_0) \vdash^* (q, \varepsilon, \varepsilon)$$

$q \in Q$



M':





M — Д.М.П.-авт. доп. по пуст. стеку
то $w \in L(M)$
$\Rightarrow s \neq \varepsilon \Rightarrow ws \notin L(M)$

Упр. M — Д.М.П.-авт., доп. по прин сост., то $\exists M'$: Д.М.П.-авт. по пуст. ст.

$L(M') = L(M)\$$

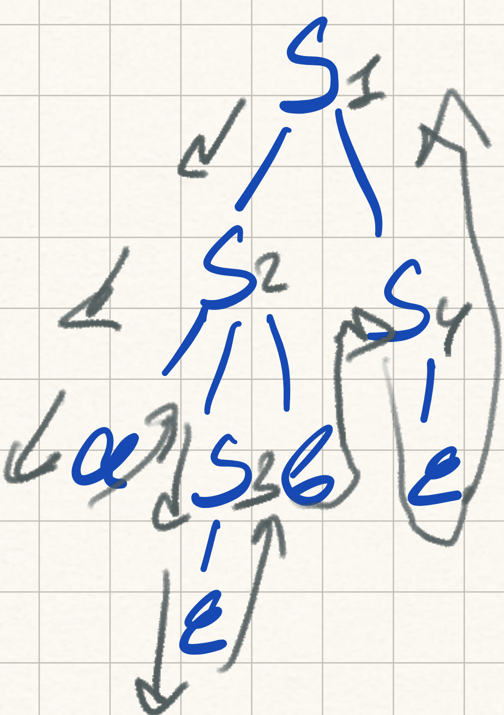
$\forall G \in C.F.G.\ \exists M:$

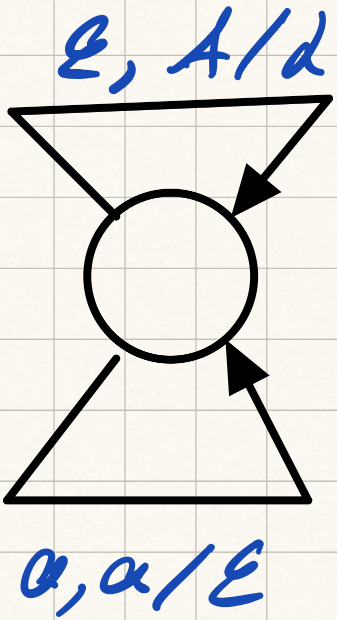
$$L(G) = L(M)$$

$$S \rightarrow aSb \mid SS \mid \varepsilon$$

$$S \Rightarrow_L SS \Rightarrow_L aSbS \Rightarrow ab\underset{\varepsilon}{}S$$

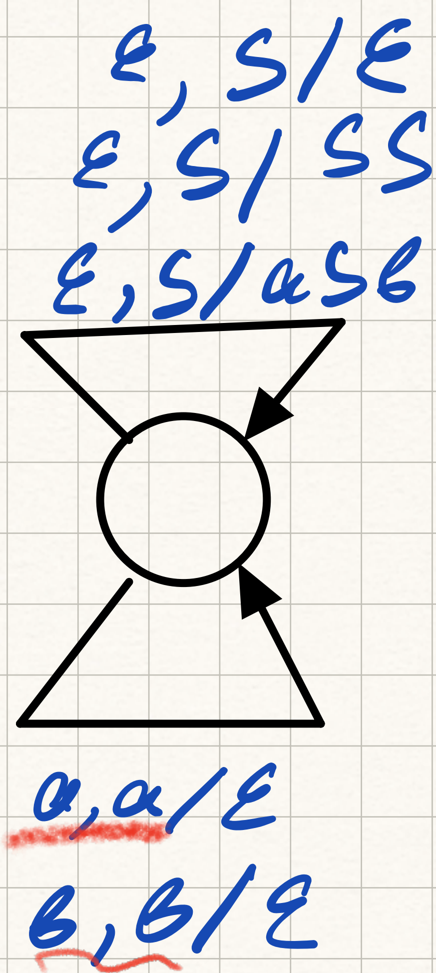
$$\Rightarrow ab\varepsilon$$





$A \to \alpha$

$Z_0 = S$



$S \to aSb \mid SS \mid \varepsilon$

$S \Rightarrow_L SS \Rightarrow_L aSbS \Rightarrow abS$

$\Rightarrow ab\varepsilon$

$(q_0, ab, S) \vdash$

$(q_0, ab, SS) \vdash$

$(q_0, \cancel{a}b, \cancel{a}SbS) \vdash$

$(q_0, b, SbS) \vdash (q_0, \cancel{b}, \cancel{b}S)$

$\vdash (q_0, \varepsilon, S) \vdash (q_0, \varepsilon, \varepsilon)$