T1. Given the regular grammar:

$G = (\{S, A\}, \{a, b\}, P, S)$

$P: S \to aA$

$A \to aA \mid bA \mid a \mid b$

$M = (Q, \Sigma, \delta, q_0, F)$, $L(G) = L(M)$

$Q = \{S, A\} \cup \{K\} = \{S, A, K\}$

$q_0 = S$

$F = \{K\}$

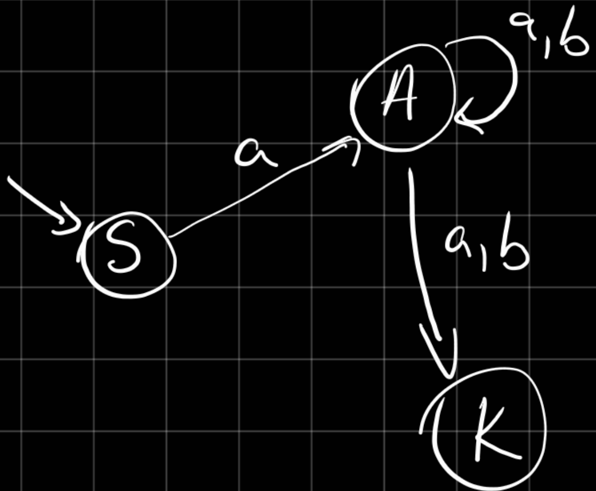
$\delta(S, a) \ni A$

$\delta(A, a) \ni A$

$\delta(A, b) \ni A$

$\delta(A, a) \ni K$

$\delta(A, b) \ni K$



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3. Given the FA $M = (Q, \Sigma, \delta, q, F)$

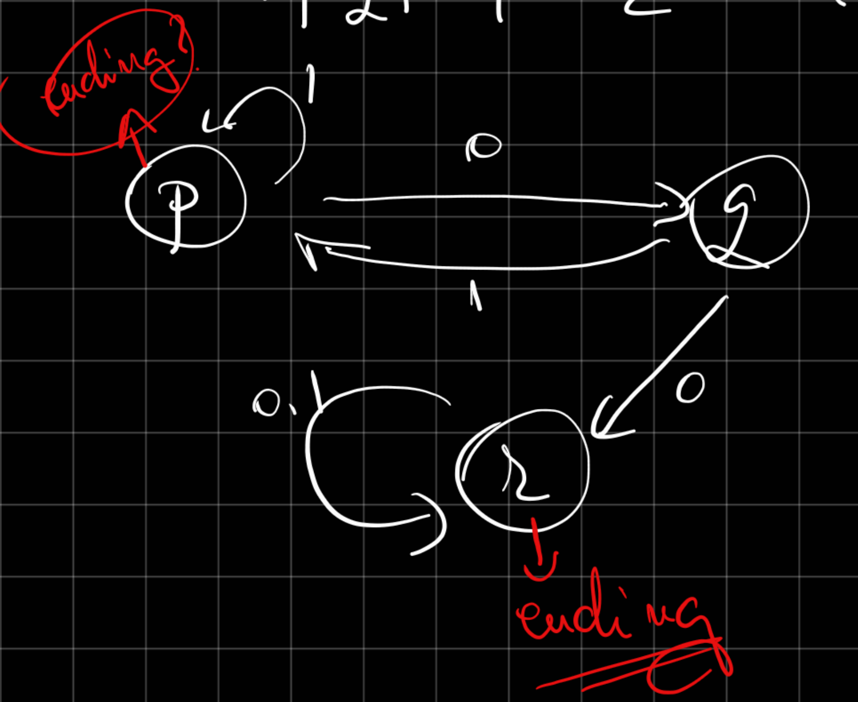
$\ldots \Sigma, \delta, q_0, F))$

$Q = \{p, q, r\}, q_0 = p, F = \{r\}, \Sigma = \{0, 1\}$

Build the equivalent right linear grammar.

$G = (N, \Sigma, P, S)$

$N = \{p, q, r\} \quad \Sigma = \{\delta\}$



$p \to 0q \mid 1p \mid \varepsilon \mid 1$

$q \to 1p \mid 0r \mid 0$

$r \to 0r \mid 1r \mid 0 \mid 1$

RG <=> RE

1. Give the R.G. corresponding to the following RE $0(0+1)^*1$

OR

$\hookrightarrow$ 0 or more times

$\hookrightarrow$ + as power = 1 or more times.

$0\,0^n\,1 \Rightarrow 0^{n+1}\,1$

$0\,1^n\,1 \qquad 0\,1^{n+1}$

$n \in \mathbb{N}$

$0 \quad G_1 = (\{S_1\}, \{0,1\}, \{S_1 \to 0\}, S_1)$

$1 \quad G_2 = (\{S_2\}, \{0,1\}, \{S_2 \to 1\}, S_2)$

$0+1 \quad G_3 = (\{S_1, S_2, S_3\}, \{0,1\}, \{S_1 \to 0, S_2 \to 1, S_3 \to 0,$
$S_3 \to 1\}, S_3)$

inaccessible sym.

$G_3' = (\{S_3\}, \{0,1\}, \{S_3 \to 0, S_3 \to 1\}, S_3\}$

$(0+1)^* \quad G_4 = (\{S_3\}, \{0,1\}, \{S_3 \to 0 | 1 | 0S_3 | 1S_3 | \varepsilon\}, S_3\}$

$G_4' = (\{S_3\}, \{0,1\}, \{S_3 \to 0S_3 | 1S_3 | \varepsilon\}, S_3\}$

! not regular

$G_5 = (\{S_1, S_3\}, \{0,1\}, \{S_3 \to 0S_3 | 1S_3 | \varepsilon,$
$S_1 \to 0S_3\}$

$G_6 = (\{S_1, S_2, S_3\}, \{0,1\}, \{S_3 \to 0S_3 | 1S_3 | S_2,$
$S_2 \to 1$

$S_1 \to 0S_3\}, S_1)$