

Да се намерят контекстносвободни граматики за езиците $L(\Gamma_1) \cup L(\Gamma_2)$, $L(\Gamma_1) \circ L(\Gamma_2)$ и $L(\Gamma_1)^*$, където Γ_1 и Γ_2 са някои измежду следните контекстносвободни граматики:

$$\begin{aligned}
& \langle \{a, b\}, \{S_1\}, S_1, \{S_1 \rightarrow \varepsilon | aS_1aS_1b\} \rangle \\
& \langle \{a, b\}, \{S_2, T_2\}, S_2, \{S_2 \rightarrow T_2bT_2 | aS_2b, T_2 \rightarrow \varepsilon | aS_2a\} \rangle \\
& \langle \{a, b\}, \{S_1, T_1\}, S_1, \{S_1 \rightarrow T_1S_1a, T_1 \rightarrow T_1bS_1 | aS_1b | a | \varepsilon\} \rangle \\
& \langle \{a, b\}, \{S_2\}, S_2, \{S_2 \rightarrow a | aS_2bS_2 | bbS_2a | S_2aS_2\} \rangle \\
& \langle \{a, b\}, \{S_1\}, S_1, \{S_1 \rightarrow b | aS_1a | S_1S_1 | S_1aS_1aS_1\} \rangle \\
& \langle \{a, b\}, \{S_1\}, S_1, \{S_1 \rightarrow \varepsilon | aaS_1S_1b\} \rangle \\
& \langle \{a, b\}, \{S_2, T_2\}, S_2, \{S_2 \rightarrow T_2T_2 | aS_2bb, T_2 \rightarrow \varepsilon | aS_2a\} \rangle \\
& \langle \{a, b\}, \{S_1, T_1\}, S_1, \{S_1 \rightarrow T_1aS_1, T_1 \rightarrow T_1S_1 | aS_1b | a | \varepsilon\} \rangle \\
& \langle \{a, b\}, \{S_2\}, S_2, \{S_2 \rightarrow a | aS_2b | bbS_2a | S_2aS_2\} \rangle
\end{aligned}$$

$$\begin{aligned}
& \langle \{a, b\}, \{S_1\}, S_1, \{S_1 \rightarrow b | aS_1a | S_1S_1\} \rangle \\
& \langle \{S, A, B\}, \{a, b\}, S, \{S \rightarrow a | AS, A \rightarrow \varepsilon | aB, B \rightarrow b | AA\} \rangle \\
& \langle \{S, A\}, \{a, b\}, S, \{S \rightarrow a | bAa, A \rightarrow aSb\} \rangle \\
& \langle \{S\}, \{a, b\}, S, \{S \rightarrow a | abS\} \rangle \\
& \langle \{S\}, \{a, b\}, S, \{S \rightarrow ba | bSa\} \rangle \\
& \langle \{S, A\}, \{a, b\}, S, \{S \rightarrow AabA, A \rightarrow \varepsilon | bSb\} \rangle \\
& \langle \{S, A\}, \{a, b\}, S, \{S \rightarrow aAb, A \rightarrow b | bSa\} \rangle \\
& \langle \{S_1\}, \{a, b\}, S_1, \{S_1 \rightarrow \varepsilon | aS_1S_1ba\} \rangle \\
& \langle \{S_2, T_2\}, \{a, b\}, S_2, \{S_2 \rightarrow T_2T_2 | aS_2bb, T_2 \rightarrow \varepsilon | aT_2a\} \rangle
\end{aligned}$$

$$\begin{aligned}
& \langle \{S_1, T_1\}, \{a, b\}, S_1, \{S_1 \rightarrow aT_1aS_1, aT_1 \rightarrow T_1T_1|aS_1b|a|\varepsilon\} \rangle \\
& \quad \langle \{S_2\}, \{a, b\}, S_2, \{S_2 \rightarrow a|b|aS_2b|bS_2a|S_2S_2\} \rangle \\
& \quad \langle \{S_1, T_1\}, \{a, b\}, S_1, \{S_1 \rightarrow a|b|aT_1a, T_1 \rightarrow aS_2\} \rangle \\
& \langle \{a, b\}, \{S_1, T_1\}, S_1, \{S_1 \rightarrow T_1aS_1, T_1 \rightarrow T_1S_1|aS_1b|a|\varepsilon\} \rangle \\
& \quad \langle \{a, b\}, \{S_2\}, S_2, \{S_2 \rightarrow a|aS_2b|bbS_2a|S_2aS_2\} \rangle \\
& \quad \langle \{a, b\}, \{S_1\}, S_1, \{S_1 \rightarrow b|aS_1a|S_1S_1\} \rangle \\
& \quad \langle \{a, b\}, \{S_1\}, S_1, \{S_1 \rightarrow \varepsilon|aaS_1S_1b\} \rangle \\
& \langle \{a, b\}, \{S_2, T_2\}, S_2, \{S_2 \rightarrow T_2T_2|aS_2bb, T_2 \rightarrow \varepsilon|aS_2a\} \rangle \\
& \quad \langle \{a, b\}, \{S_1\}, S_1, \{S_1 \rightarrow \varepsilon|aS_1aS_1b\} \rangle \\
& \langle \{a, b\}, \{S_2, T_2\}, S_2, \{S_2 \rightarrow T_2bT_2|aS_2b, T_2 \rightarrow \varepsilon|aS_2a\} \rangle
\end{aligned}$$

$$\begin{aligned}
& \langle \{a, b\}, \{S_1, T_1\}, S_1, \{S_1 \rightarrow T_1S_1a, T_1 \rightarrow T_1bS_1|aS_1b|a|\varepsilon\} \rangle \\
& \quad \langle \{a, b\}, \{S_2\}, S_2, \{S_2 \rightarrow a|aS_2bS_2|bbS_2a|S_2aS_2\} \rangle \\
& \quad \langle \{a, b\}, \{S_1\}, S_1, \{S_1 \rightarrow b|aS_1a|S_1S_1|S_1aS_1aS_1\} \rangle \\
& \quad \langle \{a, b\}, \{S_1\}, S_1, \{S_1 \rightarrow \varepsilon|bbS_1|aS_1b\} \rangle \\
& \quad \langle \{a, b\}, \{S_2, T_2\}, S_2, \{S_2 \rightarrow T_2bS_2|aS_2b, T_2 \rightarrow \varepsilon|aS_2a\} \rangle \\
& \langle \{a, b\}, \{S_1, T_1\}, S_1, \{S_1 \rightarrow T_1aS_1, T_1 \rightarrow T_1bS_1|aT_1b|a|\varepsilon\} \rangle \\
& \quad \langle \{a, b\}, \{S_2\}, S_2, \{S_2 \rightarrow a|aS_2b|bbS_2a|S_2aS_2\} \rangle \\
& \quad \langle \{a, b\}, \{S_1\}, S_1, \{S_1 \rightarrow b|S_1S_1|S_1aS_1aS_1\} \rangle \\
& \quad \langle \{a, b\}, \{S_1\}, S_1, \{S_1 \rightarrow \varepsilon|bbS_1|aS_1b\} \rangle
\end{aligned}$$

$$\begin{aligned}
& \langle \{a, b\}, \{S_2, T_2\}, S_2, \{S_2 \rightarrow T_2bS_2|aS_2b, T_2 \rightarrow \varepsilon|aS_2a\} \rangle \\
& \langle \{a, b\}, \{S_1, T_1\}, S_1, \{S_1 \rightarrow T_1aS_1, T_1 \rightarrow T_1bS_1|aT_1b|a|\varepsilon\} \rangle \\
& \quad \langle \{a, b\}, \{S_2\}, S_2, \{S_2 \rightarrow a|aS_2b|bbS_2a|S_2aS_2\} \rangle \\
& \quad \langle \{a, b\}, \{S_1\}, S_1, \{S_1 \rightarrow b|S_1S_1|S_1aS_1aS_1\} \rangle \\
& \quad \langle \{a, b\}, \{S_1\}, S_1, \{S_1 \rightarrow \varepsilon|bbS_1S_1|aS_1b\} \rangle \\
& \langle \{a, b\}, \{S_2, T_2\}, S_2, \{S_2 \rightarrow T_2bS_2|aS_2b, T_2 \rightarrow \varepsilon|aT_2S_2a\} \rangle \\
& \langle \{a, b\}, \{S_1, T_1\}, S_1, \{S_1 \rightarrow T_1aS_1, T_1 \rightarrow T_1bS_1|aT_1b|a|\varepsilon\} \rangle \\
& \quad \langle \{a, b\}, \{S_2\}, S_2, \{S_2 \rightarrow \varepsilon|a|aS_2b|bbS_2a|aS_2\} \rangle \\
& \quad \langle \{a, b\}, \{S_1\}, S_1, \{S_1 \rightarrow b|S_1S_1S_1|bS_1aS_1\} \rangle
\end{aligned}$$