Assignment 3 Theory

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CFG rules

1 - Write a CFG for accepting strings with equal number of a's and b's.

S -> aSb | bSa | ba | ab | ε

2- Write a CFG for accepting strings where the number of b's is twice the number of a's.

S -> aSbSbS | bSbSaS | bSaSbS | ε

3- Write a CFG for accepting strings that is not a palindrome Σ = {a,b}.

S -> aSa | bSb | aTb | bTa,
T -> aT | bT | ε

4- Write a CFG for accepting a language $\{a^{2n+3} b^{n} \mid n>=0\}$.

S -> aaaT | ε,
T-> aaTb | ε

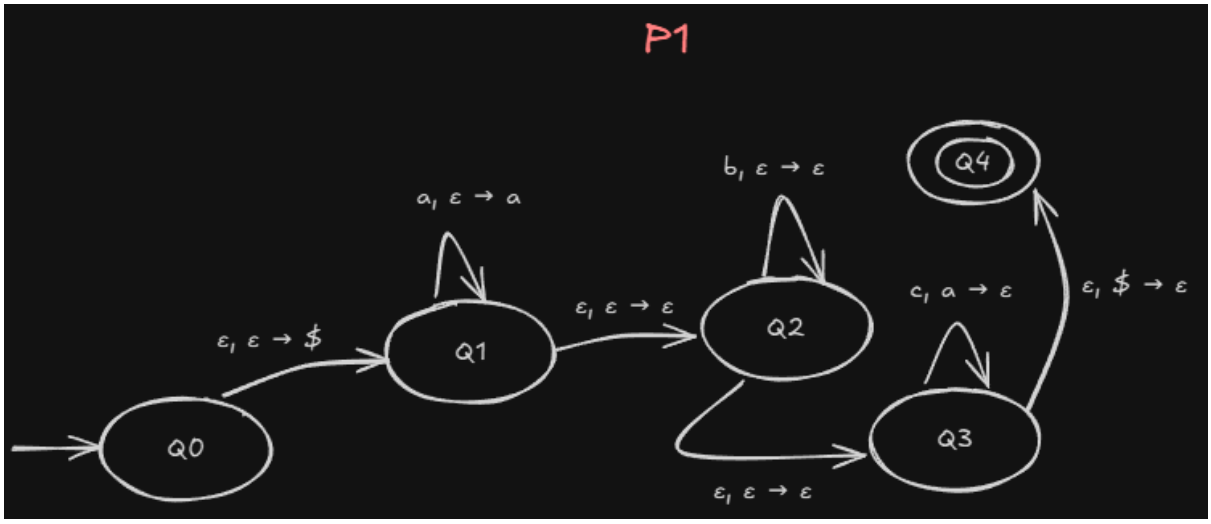
5- Write a CFG for accepting a language $\{a^{n} b^{m} \mid n>m \text{ and } m>=0\}$.

S -> aS | aB,

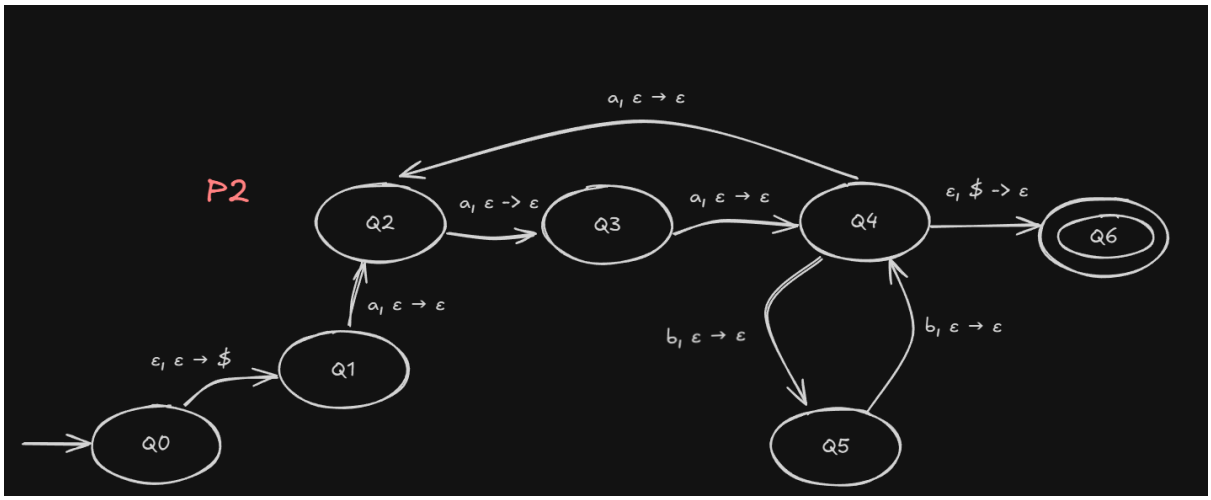
B -> aBb | ε

PDA

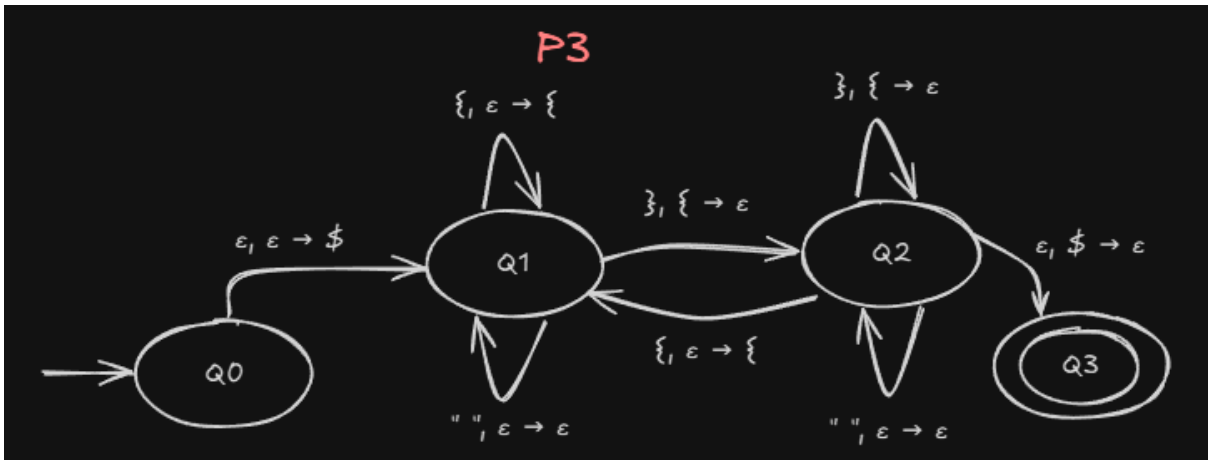
1. Design a PDA for accepting a language {$a^n b^m c^n | n,m>=0$}.



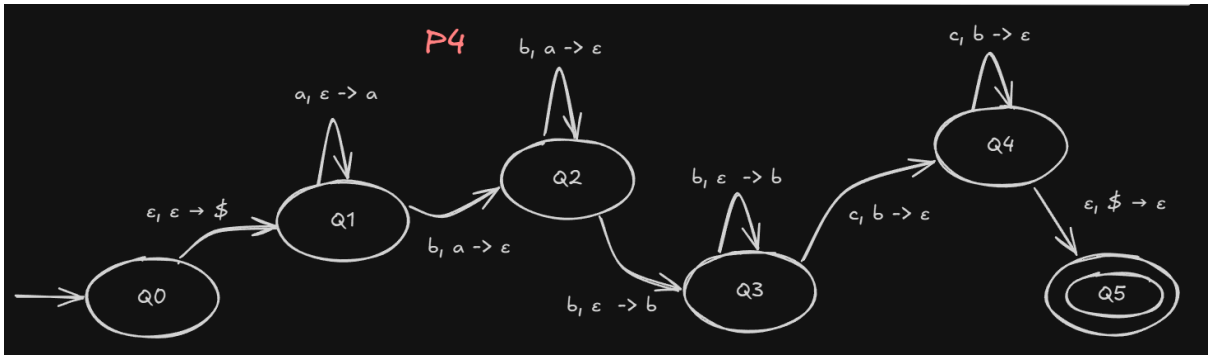
2. Design a PDA for accepting a language {$a^{3n} b^{2n}$ n>=1}.



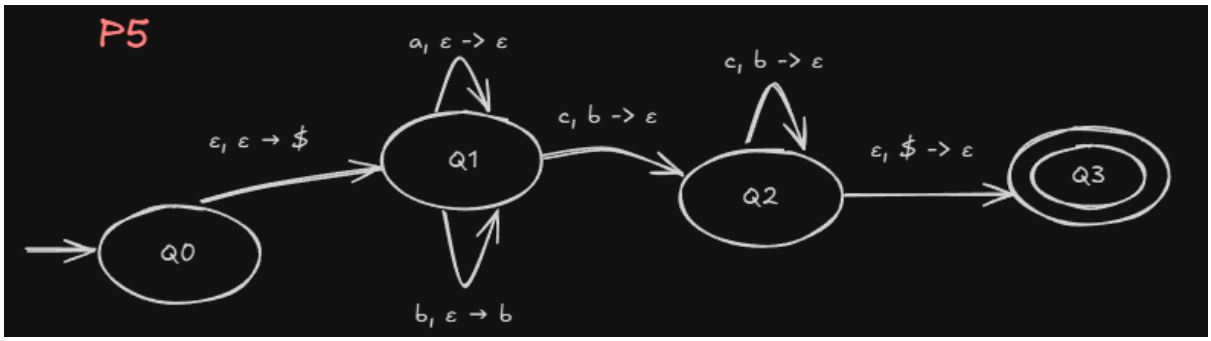
3. Design a PDA for accepting a language that consists of strings of balanced



4. Design a PDA for accepting a language $\{a_n b_{n+m} c_m \mid n, m >= 1\}$.



5. Design a PDA for language $\{W c_k \mid W \in \{a,b\}^* \text{ and } n >= 0 \text{ and } k = |W|_b$ (k=the number of b in W)$\}$.



BONUS - Convert the following CFG to PDA: