

$$L = \left\{ a^n b^m c^k d^p \mid n > 0, m > 0, p > n, k > m \right\}$$

CFG

$$G = \langle V_N, V_T, S, A \rangle$$

$$V_N = \{S, A, B\}, \quad V_T = \{a, b, c, d\}$$

$$S \Rightarrow a A d d$$

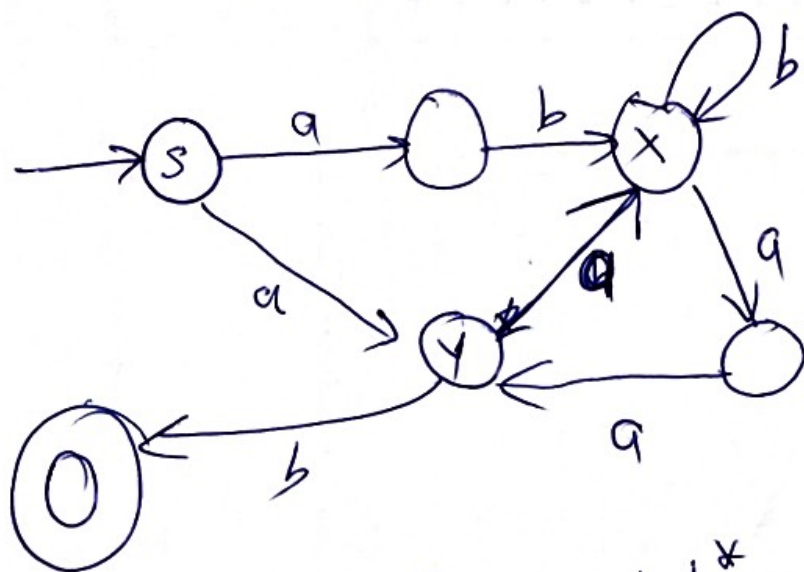
$$A \Rightarrow a A d \mid A d \mid b B c c$$

$$B \Rightarrow b B c \mid B c \mid \epsilon$$

Örnek: $S \Rightarrow a b X \mid a Y$

$$X \Rightarrow a a Y \mid b X$$

$$Y \Rightarrow a X \mid b$$



$$L = (a + a b b^* a a) (a b^* a a)^* b$$

Örnek: $L = \{ \underline{a^{2k}} \underline{b^n c^{2n}} \underline{d^k} \mid k \geq 1, n \geq 1 \}$

$$S \Rightarrow aa S d \mid aa A d$$

$$A \Rightarrow b A c c \mid b c c$$

Örnek: $a^{n+m} b^k c^{m+k} d^{2n} \mid n, m, k \geq 0$

$$\underline{a^n} \underline{a^m} \underline{b^k} \underline{c^m} \underline{c^k} \underline{d^{2n}}$$

$$S \Rightarrow a S d d \mid A$$

$$A \Rightarrow a A c \mid B$$

$$B \Rightarrow b B c \mid \Lambda$$

$$L = \left\{ x \in (0,1)^* \mid n_0(x) = n_1(x) \right\}$$

$\Lambda \in L$ olacaktır $S \Rightarrow \Lambda$

0 ve 1'lerin sayısı eşit olacağına göre ilk akla gelen kural

$$S \Rightarrow 0S1 \mid 1S0$$

Bu kural kümesi aynı sime ile başlayıp biten katarlara izin vermiyor.

Örneğin $\boxed{0110} \in L$ olduğu halde türetileniyor.
 $\rightarrow 10001101 \leftarrow$

$$S \Rightarrow \Lambda \mid 0S1 \mid 1S0 \mid SS$$

$$X = 0110$$

$$S \Rightarrow SS \Rightarrow 0S1S \Rightarrow 01S \Rightarrow 01SS$$

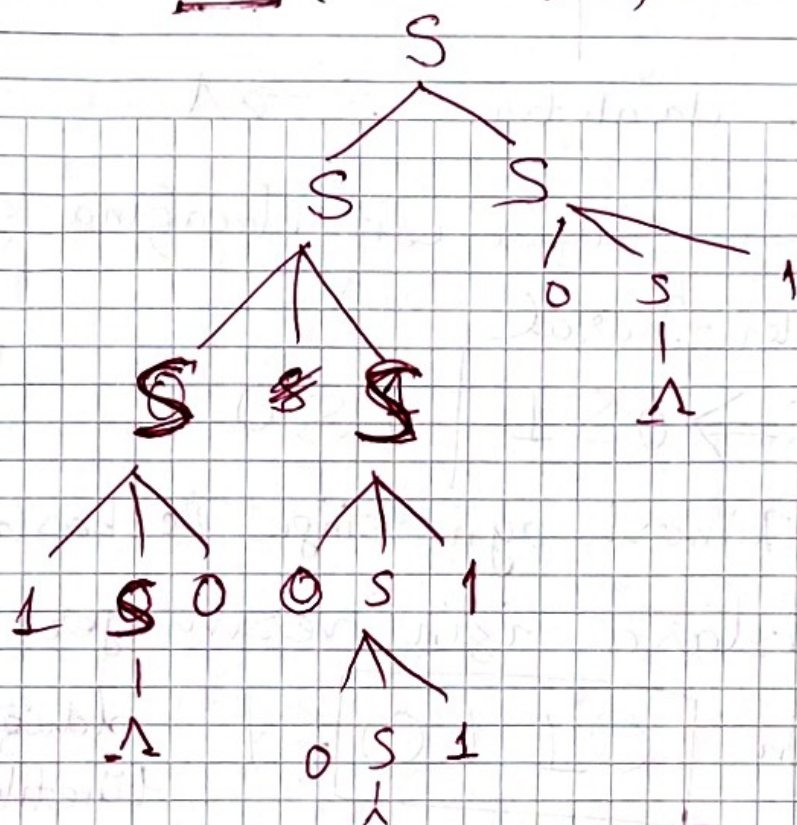
$$\Rightarrow 011S0S \Rightarrow 0110S \Rightarrow 0110$$

$$X = 10001101 \stackrel{?}{\in} L$$

$$S \Rightarrow SS \Rightarrow 1S0S \Rightarrow 1(0S1)0S \Rightarrow 100S110S$$

$$\Rightarrow \boxed{100} \boxed{0S1} \boxed{110S}$$

$$X = \underline{10001101} \stackrel{?}{\in} \mathbb{L}$$



$$S \Rightarrow SS \Rightarrow SSS \Rightarrow 1S0 \Rightarrow SS$$

$$\Rightarrow 10 \text{ SS} \Rightarrow 100 \text{ S1S} \Rightarrow 1000 \text{ S11S}$$

$$\Rightarrow 1000115 \Rightarrow 100011 \odot S1$$

$$\Rightarrow 10001101$$

L definiert

$$L = \{x \in \{0,1\}^* \mid n_0(x) \neq n_1(x)\}$$

$$S \Rightarrow A \mid B \quad L_0 \mid L_1$$

$$A \Rightarrow 0 \mid 0A \mid 1AA \mid AA1 \mid A1A$$

$$B \Rightarrow 1 \mid 1B \mid 0BB \mid BB1 \mid B0B$$