

$$1d) R_{11}^{(0)} = \varepsilon, \quad R_{44}^{(0)} = b + \varepsilon, \quad R_{13}^{(0)} = a, \quad R_{33}^{(0)} = b + \varepsilon, \quad R_{14}^{(0)} = \emptyset$$

$$R_{13}^{(1)} = R_{13}^{(0)} + R_{11}^{(0)} (R_{11}^{(0)})^* R_{13}^{(0)} = a + \varepsilon \varepsilon^* a = a$$

$$R_{14}^{(1)} = R_{14}^{(0)} + R_{11}^{(0)} (R_{11}^{(0)})^* R_{14}^{(0)} = \emptyset + \varepsilon \varepsilon^* \emptyset = \emptyset$$

1.e)

$$b^* (ab^* a b b^*)^* (\varepsilon + a b^* a) b^*$$

3. f)

$L_{nw}$  é uma ~~LFL~~ CFL. ~~É~~ possível CFH:

$$S \rightarrow S_{\text{odd}} \mid S_{\text{even}}$$

$$S_{\text{odd}} \rightarrow 0R \mid 1R \mid 0 \mid 1$$

$$R \rightarrow 0S_{\text{odd}} \mid 1S_{\text{odd}}$$

$$S_{\text{even}} \rightarrow xy \mid yx$$

$$x \rightarrow zxz \mid 0$$

$$y \rightarrow zyz \mid 1$$

$$z \rightarrow 0 \mid 1$$