Lab 03

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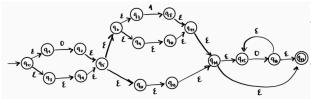
Problema 2: 25%

Utilice el Lema de Arden para encontrar la expresión regular del siguiente autómata. Dejo todo su procedimiento



$q_0 = \varepsilon$

$q_1 = \varepsilon + q_0\varepsilon$

$q_2 = \varepsilon + q_1 0 \rightarrow \varepsilon + (\varepsilon + q_0\varepsilon)0$

$q_3 = \varepsilon + q_0\varepsilon$

$q_4 = \varepsilon + q_3\varepsilon \rightarrow \varepsilon + (\varepsilon + q_0\varepsilon)\varepsilon$

$q_5 = q_2\varepsilon + q_4\varepsilon$

$= \varepsilon(q_2 + q_4) \rightarrow \varepsilon[\varepsilon + (\varepsilon + q_0\varepsilon)0 + \varepsilon + (\varepsilon + q_0\varepsilon)\varepsilon]$

$\varepsilon[\varepsilon + (\varepsilon + q_0\varepsilon)(0 + \varepsilon)]$

$\varepsilon + \varepsilon(\varepsilon + q_0\varepsilon)(0 + \varepsilon) = (\varepsilon + q_0)(0 + \varepsilon)$

$q_5 = (\varepsilon + q_0)(0 + \varepsilon)$

$q_6 = q_5\varepsilon = (\varepsilon + q_0)(0 + \varepsilon)$

$q_7 = q_6\varepsilon = (\varepsilon + q_0)(0 + \varepsilon)$

$q_8 = \varepsilon + q_7 1 = (\varepsilon + q_0)(0 + \varepsilon)1 + \varepsilon$

$q_9 = q_6\varepsilon = (\varepsilon + q_0)(0 + \varepsilon)$

$q_{10} = q_9\varepsilon = (\varepsilon + q_0)(0 + \varepsilon)$

$q_{11} = q_8\varepsilon + q_{10}\varepsilon = (\varepsilon + q_0)(0 + \varepsilon)1 + (\varepsilon + q_0)(0 + \varepsilon) + \varepsilon$

$q_{11} = (\varepsilon + q_0)(0 + \varepsilon)(1 + \varepsilon)$

$q_{12} = q_5\varepsilon = (\varepsilon + q_0)(0 + \varepsilon)$

$q_{13} = \,''$

$q_{14} = q_{13}\varepsilon + q_{11}\varepsilon = (\varepsilon + q_0)(0 + \varepsilon) + (\varepsilon + q_0)(0 + \varepsilon)(1 + \varepsilon)$

$= (\varepsilon + q_0)(0 + \varepsilon)(\varepsilon + 1 + \varepsilon)$

$q_{14} = (\varepsilon + q_0)(0 + \varepsilon)(\varepsilon + 1)$

$q_{15} = q_{14}\varepsilon + q_{16}\varepsilon = (\varepsilon + q_0)(0 + \varepsilon)(\varepsilon + 1) + q_{16}$

$q_{16} = \varepsilon + q_{15}0 \rightarrow [(\varepsilon + q_0)(0 + \varepsilon)(\varepsilon + 1) + q_{16}]0 + \varepsilon$

$= (\varepsilon + q_0)(0 + \varepsilon)(\varepsilon + 1)0 + q_{16}0 + \varepsilon \rightarrow q_{16} = [\varepsilon + (\varepsilon + q_0)(0 + \varepsilon)(\varepsilon + 1)0]0^*$

$q_{17} = \varepsilon + q_{14}\varepsilon + (\varepsilon + q_0)(0 + \varepsilon)(\varepsilon + 1)0 + q_{16}0$

$= \varepsilon + (\varepsilon + q_0)(0 + \varepsilon)(\varepsilon + 1) + (\varepsilon + q_0)(0 + \varepsilon)(\varepsilon + 1)0 + q_{16}0$

$= (\varepsilon + q_0)(0 + \varepsilon)(\varepsilon + 1)[\varepsilon + 0] + q_{16}$

$q_{17} = (\varepsilon + q_0)(0 + \varepsilon)(\varepsilon + 1)(\varepsilon + 0) + [\varepsilon + (\varepsilon + q_0)(0 + \varepsilon)(\varepsilon + 1)0]0^*$