

Examen B

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1. Solución

$$\delta(e_0, a, z_0) = (e_0, A z_0)$$

$$\delta(e_0, a, A) = (e_0, AA)$$

$$\delta(e_0, b, A) = (e_1, A)$$

$$\delta(e_1, c, A) = (e_2, \varepsilon)$$

$$\delta(e_2, \varepsilon, A) = (e_3, A)$$

Entonces

$$P = (\{e_0, e_1, e_2, e_3\}, \{a, b, c\}, \{A, z_0\})$$

$$\delta, e_0, z_0, \{e_3\}$$

2. Convertir la gramática libre de contexto que se muestra a continuación en un Autómata de Pila

$$G = (\{S, A, B, C, D, E, F, G, H\}, \{a, b\}, P, \{S\})$$

$$S \rightarrow A | B$$

$$A \rightarrow aEA | aFC$$

$$B \rightarrow aEB | aFD$$

$$C \rightarrow bC$$

$$D \rightarrow bD | \varepsilon$$

$$E \rightarrow aEE | aFG | bG$$

$$F \rightarrow aEF | aFH | bH$$

$$G \rightarrow \varepsilon$$

$$H \rightarrow b$$

2. Solución

Tenemos

$$T = \{0, \varepsilon, b\}$$

donde

$$P(Q, \varepsilon, \Gamma, S, q_0, z_0)$$

$$Q = \{q\} \quad \Sigma = \{a, b\}$$

$$\Gamma = \{S, A, B, C, D, E, F, G, H, 0, \varepsilon, b\}$$

$$z_0 = \varepsilon$$

$$q_0 = q$$

Transiciones

$$\delta(q, a, a) = (q, \varepsilon)$$

$$\delta(q, \varepsilon, \varepsilon) = (q, \varepsilon)$$

$$\delta(q, b, b) = (q, \varepsilon)$$

Para δ

$$\delta(q, \varepsilon, S) = \{(q, A), (q, B)\}$$

$$\delta(q, \varepsilon, A) = \{(q, a \in A), (q, a \in F \cap C)\}$$

$$\delta(q, \varepsilon, B) = \{(q, a \in B), (q, a \in F \cap D)\}$$

$$\delta(q, \varepsilon, C) = \{(q, \varepsilon C), (q, bC)\}$$

$$\delta(q, \varepsilon, D) = \{(q, bD), (q, \varepsilon)\}$$

$$\delta(q, \varepsilon, E) = \{(q, a \in E), (q, a \in F \cap G), (q, bG)\}$$

$$\delta(q, \varepsilon, F) = \{(q, a \in F), (q, a \in F \cap H), (q, bH)\}$$

$$\delta(q, \varepsilon, G) = \{q, \varepsilon\} \quad \text{y} \quad \delta(q, \varepsilon, H) = \{q, b\}$$

3. Para la maquina de turing indicada, determinar si las cadenas siguientes son aceptadas y realice el diagrama de transición

a. 01

b. 011

Para 01

$q_0 01 + Bq_0 1 + BBq_1 B + BBBq_f B$

$S(q_0, 0) \quad S(q_0, 1) \quad S(q_1, B) \quad \text{estado } q_f$

Entonces

01 si es aceptada

011

$q_0 011 + Bq_0 11 + BBq_1 1 + BBBq_1 B$

$S(q_0, 0) \quad S(q_0, 1) \quad S(q_1, 1) \quad S(q_1, B)$

$BBBBq_f B$

Estado q_f

Entonces

011 si es aceptada

Diagrama de transición

