DFA

1 Defintions

Let $\Psi = \{a,b,c,...,z\}$
Let $\Upsilon = \{0,1,2,...,9\}$
Let $\Delta = \{.\}$
Let $\Theta = \{@\}$

Let $Q = \{q_0, q_1, q_2, ..., q_{10}, q_{trap}\}$ where q_0 is the start state, and q_{trap} is a state with an outdegree of 0.

Let $\Sigma = \Psi \cup \Upsilon \cup \Delta \cup \Theta$

Let $F = \{q_7\}$ be the set of valid final states.

Let $B_1 = \Psi(\Psi \cup \Upsilon)^*$
Let $B_2 = \Delta\Psi(\Psi \cup \Upsilon)^*$
Let $B_3 = \{.edu\}$

Let $L_1 = B_1\Theta B_1 B_3$
Let $L_2 = B_1 B_2^* \Theta B_1 B_2^* B_3$

Let our language $L = L_1 \cup L_2$

Let δ be represented by the table on the next page.

State (q)	Input (a)	Next State ($\delta(q, a)$)
q_0	Ψ	q_1
q_0	$\Sigma - \Psi$	q_{trap}
q_1	$\Psi \cup \Upsilon$	q_1
q_1	Δ	q_8
q_1	Θ	q_2
q_2	Ψ	q_3
q_2	$\Sigma - \Psi$	q_{trap}
q_3	$\Psi \cup \Upsilon$	q_3
q_3	Δ	q_4
q_3	Θ	q_{trap}
q_4	$\{e\}$	q_5
q_4	$\Psi - \{e\}$	q_{10}
q_4	$\Upsilon \cup \Delta \cup \Theta$	q_{trap}
q_5	$\{d\}$	q_6
q_5	$\Psi \cup \Upsilon - \{d\}$	q_{10}
q_5	Δ	q_4
q_5	Θ	q_{trap}
q_6	$\{u\}$	q_7
q_6	$\Psi \cup \Upsilon - \{u\}$	q_{10}
q_6	Δ	q_4
q_6	Θ	q_{trap}
q_7	Δ	q_4
q_7	$\Sigma - \Delta - \Theta$	q_{10}
q_7	Θ	q_{trap}
q_8	Ψ	q_9
q_8	$\Sigma - \Psi$	q_{trap}
q_9	$\Psi \cup \Upsilon$	q_9
q_9	Δ	q_1
q_9	Θ	q_2
q_{10}	$\Sigma \cup \Upsilon$	q_{10}
q_{10}	Δ	q_4
q_{10}	Θ	q_{trap}
q_{trap}	Σ	q_{trap}

Finally, let the DFA $M = (Q, \Sigma, \delta, q_0, F)$.