

Worksheet #2

Deterministic Finite Automata

1. What is the maximum number of states that a deterministic finite automaton (DFA) may have?

As long as the number of states is finite (an arbitrarily large finite number).

2. How many start states can a DFA have? How many accept states?

One start state and a finite number of accept states.

3. Given a DFA with 4 states and an alphabet of size 10, what is the full size of the δ transition function set?

$$10 * 4 = 40$$

4. Suppose M is a DFA. Clearly define $L(M)$.

$$L(M) = \{w: w \text{ is a string over } \Sigma \text{ and } M \text{ accepts } w\}$$

-or-

$$L(M) = \{w: w \text{ is a string over } \Sigma \text{ and } \delta(q, w) \in F\}$$

-where-

$$M = (Q, \Sigma, \delta, q, F)$$

5. What is the definition of a regular language?

A regular language is a language that is accepted by a DFA.

6. Suppose we have the alphabet $\Sigma = \{a, b, c\}$. Draw a DFA that accepts strings of the form $aabb c_n$ where $n > 0$.

	a	b	c
q0	q1	R	R
q1	q2	R	R
q2	R	q3	R
q3	R	q4	R

q4	R	R	q5
q5	R	R	q5

