6 Regular Languages

Defn: A language is regular if some FA recognizes it.

Defn: Let **RL** denote the class of regular languages.

$\{w \in \{0,1\}^* \mid w \text{ has an even number of 0's}\} \in RL$.

ie:

$\{w \in \{0,1\}^* \mid \#_0(w) \text{ is even}\} \in RL$

Regular Languages

We were introduced last lecture to $\cup$, $\cdot$, $*$, operations on languages that are the "regular" operations.

We also discussed when a set is closed under a (unary or binary) operation.

Defn The closure of a set A under operation f is the smallest superset of A that is closed under f.

E.g. What is the closure of $\mathbb{N} = \{1, 2, 3, 4, 5, \ldots\}$ under...

$+$

$-$

negation

$\times$ (mult)

$\div$

What is the closure of $\{aa\}$ under:

-

What is the closure of $\{a,b\}$ under:

-

Another math notation that will be useful to recall:

$Q_1 \times Q_2$ = the set of ordered pairs of states, - first is from Q_1
- second is from Q_2.

function "types" are usually written

$$\delta : Q \times \Sigma \to Q$$

eg $\delta(q_0, a) = q_1$
$\delta(q_1, a) = q_0$