3.1.1
Graphical representation of DFA
Directed graph with nodes representing **states** and edge/arcs representing **transitions** labeled by symbols in $\Sigma$

For each state (vertex) $q$ and symbol $a \in \Sigma$ there is **exactly** one outgoing edge labeled by $a$

Initial/start state has a pointer (or labeled as $s$, $q_0$ or “start”)

Some states with double circles labeled as accepting/final states
Where does 001 lead?
Where does 10010 lead?
Which strings end up in accepting state?
Can you prove it?
Every string $w$ has a unique walk that it follows from a given state $q$ by reading one letter of $w$ from left to right.
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Every string $w$ has a unique walk that it follows from a given state $q$ by reading one letter of $w$ from left to right.
Definition

A DFA $M$ accepts a string $w$ iff the unique walk starting at the start state and spelling out $w$ ends in an accepting state.
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The language accepted (or recognized) by a DFA $M$ is denoted by $L(M)$ and defined as:

$$L(M) = \{ w | M \text{ accepts } w \}.$$
“$M$ accepts language $L$” does not mean simply that that $M$ accepts each string in $L$.

It means that $M$ accepts each string in $L$ and no others. Equivalently $M$ accepts each string in $L$ and does not accept/rejects strings in $\Sigma^* \setminus L$.

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THE END

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(for now)