

The set of binary strings with a 1 in the 3rd position from the start

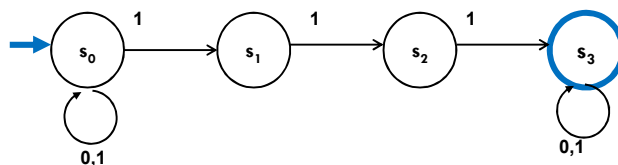
Nondeterministic Finite Automata

An NFA:

Still has exactly one start state and any number of final states.

The NFA accepts x if there is some path from a start state to a final state labeled with x .

From a state, you can have 0,1, or many outgoing arrows labeled with a single character. You can choose any of them to build the required path.



Three ways to think about NFAs

"**Outside Observer**": is there a path labeled by x from the start state, to the final state (if we know the input in advance can we tell the NFA which decisions to make)

"**Perfect Guesser**": The NFA has input x , and whenever there is a choice of what to do, it **magically** guesses a transition that will eventually lead to acceptance (if one exists)

"**Parallel exploration**": The NFA computation runs all possible computations on x in parallel (updating each possible one at every step)

What about those ε -transitions?

