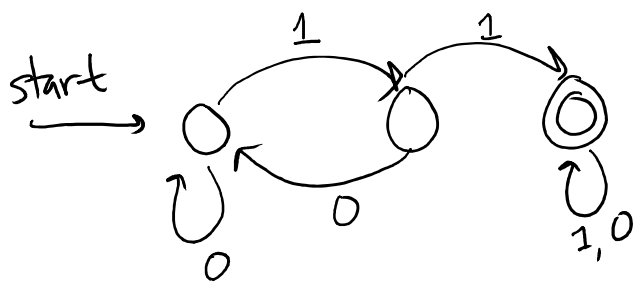


Can use graphs to represent functions



represents a function

$$f: \{0,1\}^* \rightarrow \{0,1\}$$

$$\text{where } \{0,1\}^* = \bigcup_{n=0}^{\infty} \{0,1\}^n$$

⊙ = output 1 if end here

○ = output 0 if end here

$$\text{ex: } f(0101) = 0$$

$$f(01101) = 1$$

$$f(0010) = 0$$

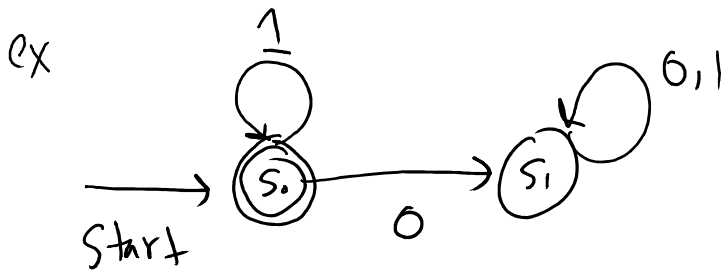
$$f(\emptyset) = 0$$


Q. What does this function do?

A. Outputs 1 if there are 2 consecutive 1's.

These graphs are called DFAs (Discrete Finite Automata)

They are a type of limited computer. You will explore more in 301!



Double circle means  
  $s_i$  is accepting state

Q: What strings in  $\{0,1\}^*$  will this string accept?

- A) Strings that start with 1
- B) Strings that contain only 1's
- C) Strings that don't contain 0's
- D) Strings that contain only 0's.

$$\{1^n : n \in \mathbb{N}\}$$

Powerpoint problems...