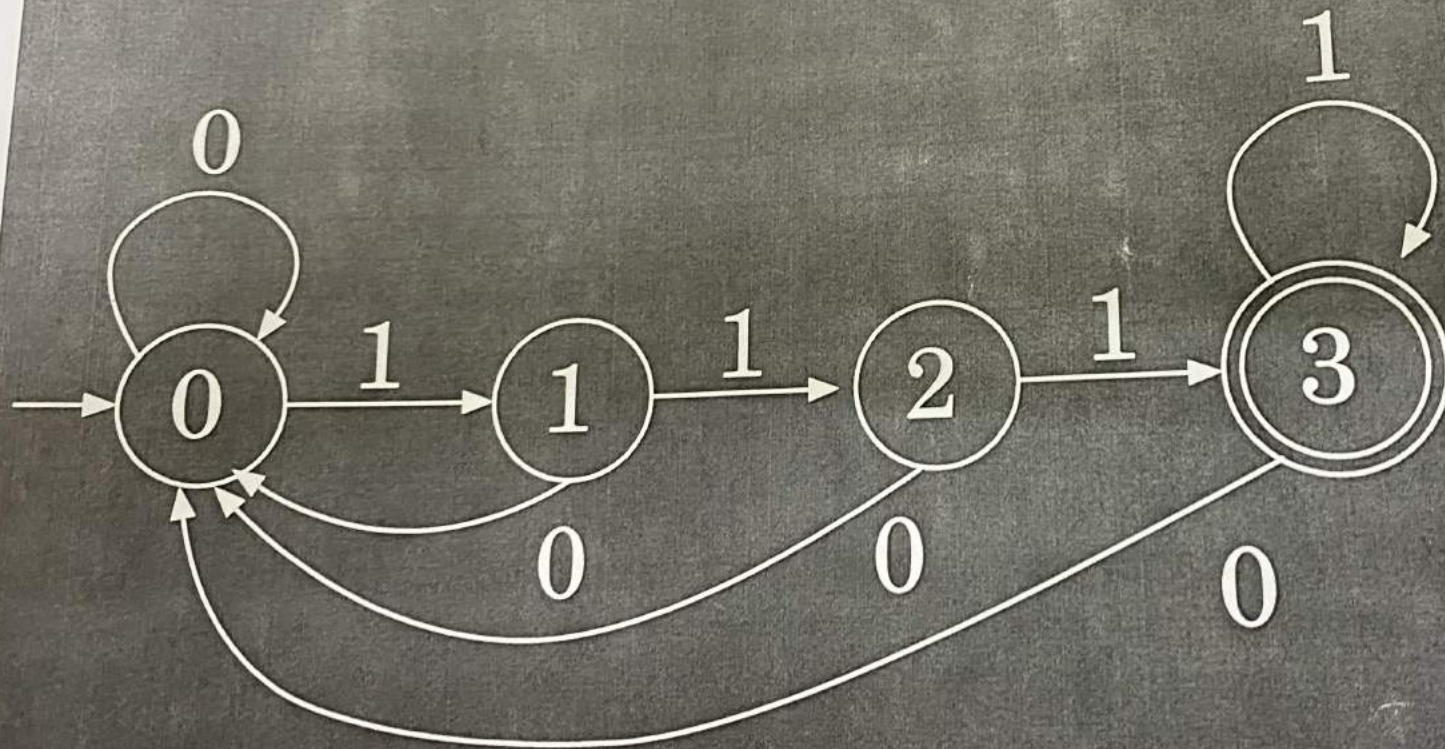


03-17: Fun with DFA

Create a DFA for:

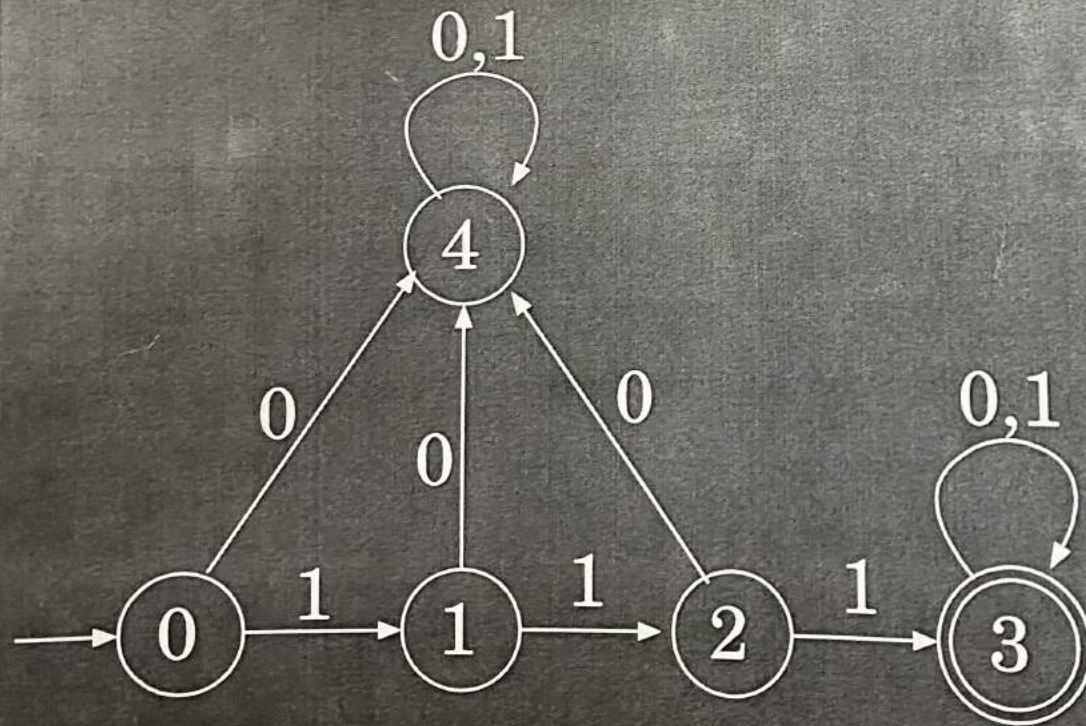
- All strings over $\{0, 1\}$ that end with 111



03-19: Fun with DFA

Create a DFA for:

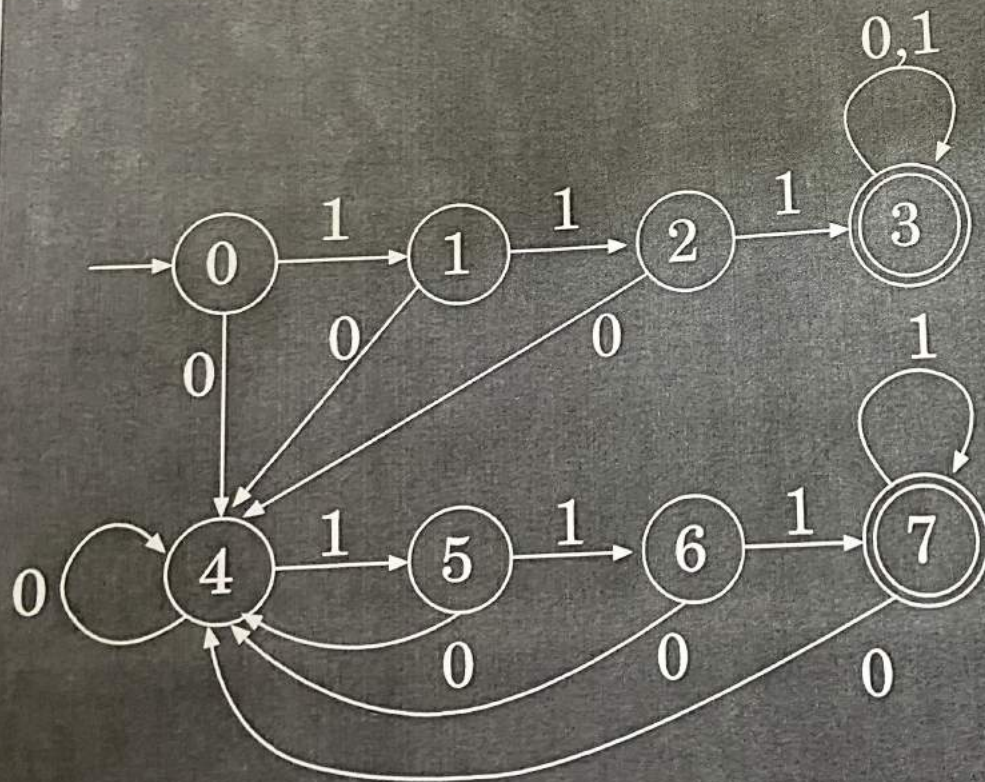
- All strings over $\{0, 1\}$ that begin with 111



03-21: Fun with DFA

Create a DFA for:

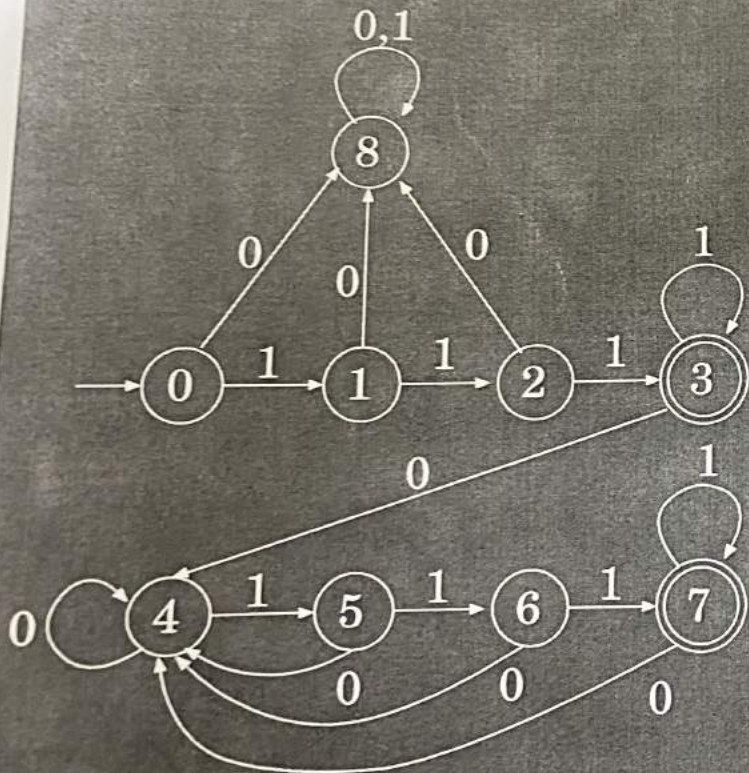
- All strings over $\{0, 1\}$ that begin or end with 111



03-23: Fun with DFA

Create a DFA for:

- All strings over $\{0, 1\}$ that begin *and* end with 111



a) Find a regex representing the set of ~~strings~~ strings in which every 0 is immediately followed by at least two 1s.

(b) Prove that the regular expression ~~also describes the same set of strings L~~

$R = \epsilon + 1^*(011)^*(1^*(011)^*)^*$
also describes the same set of strings L

Formal Language
and Automata
Theory (CS21004)

Soumyajit Dey
CSE, IIT
Kharagpur

Pattern Matching

Regular
Expressions

Regular Grammars

(a) Has no zeros.
or has zeros with ~~at least~~ two 1s
following

$$(1 + 011)^*$$

(b) To show $R = (1 + 011)^*$

(i.e.)

$$\epsilon + 1^*(011)^*(1^*(011)^*)^* = (1 + 011)^*$$

~~Let~~ Let $P = 1^*(011)^*$

$$L.H.S = \epsilon + PP^* = P^*$$

$$Q = 1 \quad S = 011.$$

$$\begin{aligned} L.H.S &= P^* = (Q^* S^*)^* \\ &= (Q + S)^* \\ &= (1 + 011)^* \end{aligned}$$