

HW for Fri 8/24:

8/22

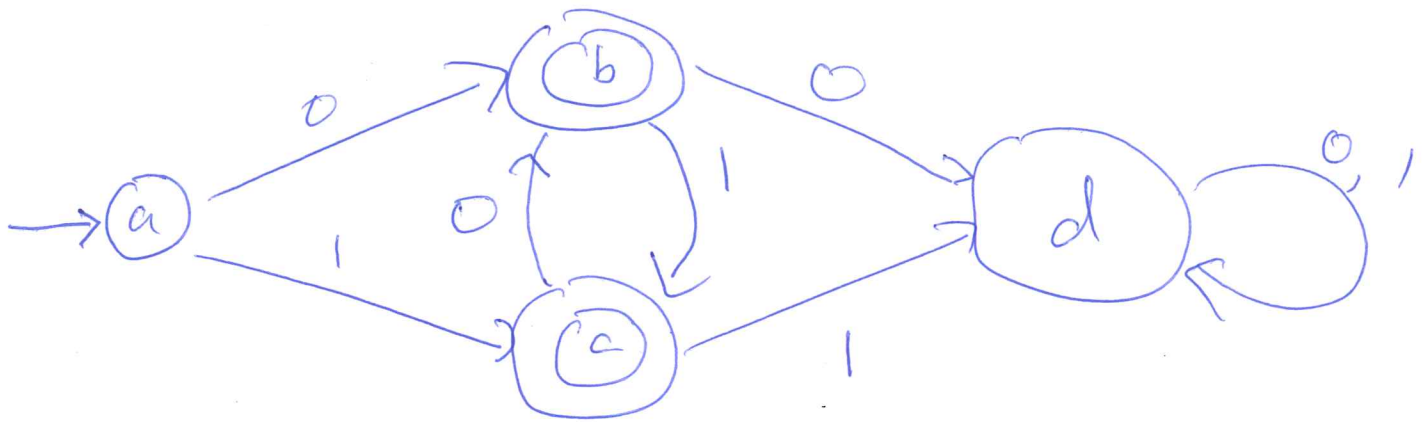
Problem 2.1.2d

These notes:

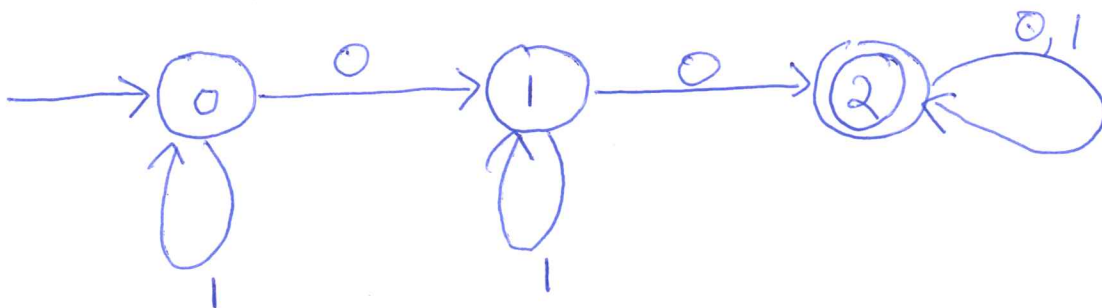
webpages.uidaho.edu/AlexanderWoo/385

Last time:

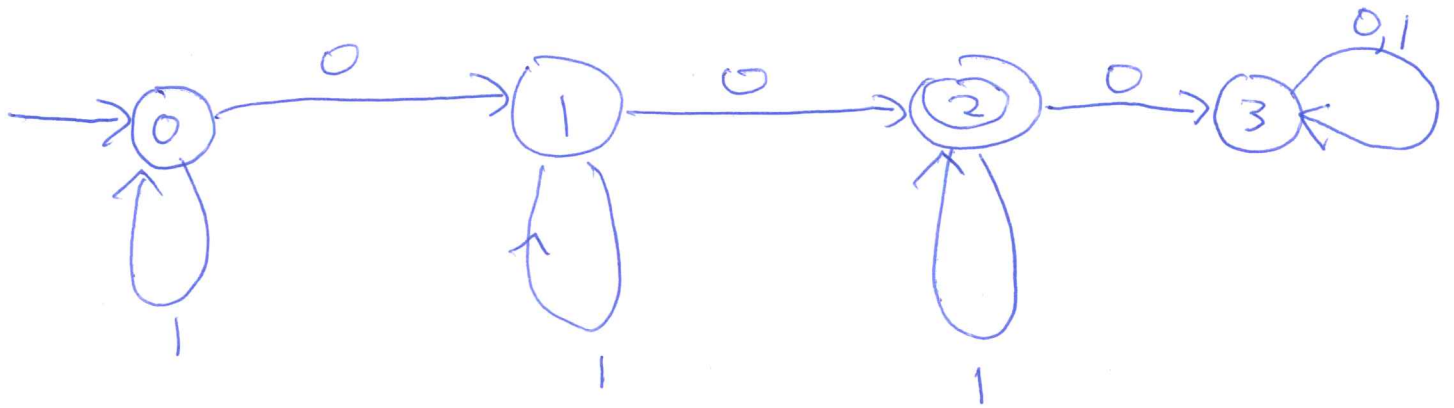
Automaton accepting strings alternating btw 0's + 1's



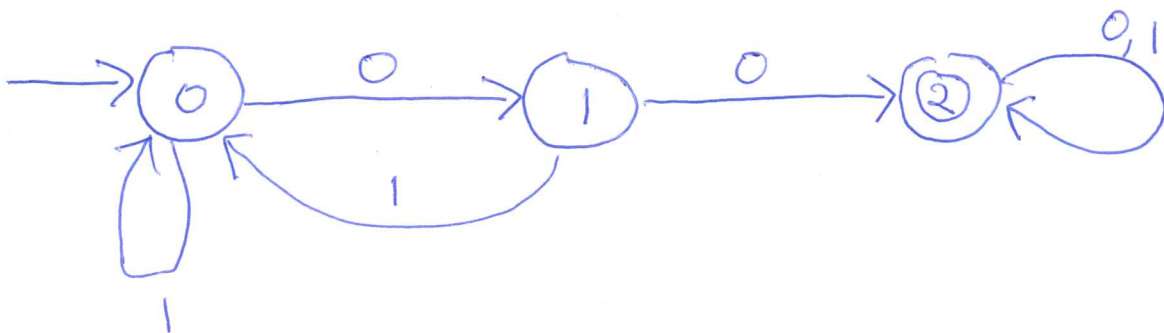
Construct a DFA accepts strings w/ 2 or more 0's. (on alphabet of 0's + 1's)



Construct DFA accepts strings w/ exactly 2 0's.



Construct DFA accepting strings w/ 2 (or more) consecutive 0's somewhere



Formalizing DFAs

Def: A DFA is (formally, mathematically)

a tuple $(Q, \Sigma, \delta, q_0, F)$ where

Q is a finite set (of states)

Σ is a finite set (of letters, called the alphabet)

$\delta: Q \times \Sigma \longrightarrow Q$ (the transition function)

$q_0 \in Q$ (the initial state)

$F \subseteq Q$ (the final states or accepting states)

The above describes the data structure of a DFA - now I have to tell you how it works - this means telling you what strings it accepts.

Def: A string on an alphabet Σ is either

a) the empty string λ

b) a letter $l \in \Sigma$ followed by a string w

Def: A DFA $M = (Q, \Sigma, \delta, q_0, F)$ accepts a string w starting from state q if

a) If $w = \lambda$ (the empty string) then if $q \in F$

b) If $w = lw'$ (l a letter, w' a string) then if

M accepts w' starting ^{from state} $\delta(q, l)$.

Def: A DFA M accepts a string w if
 M accepts w starting from q_0 .