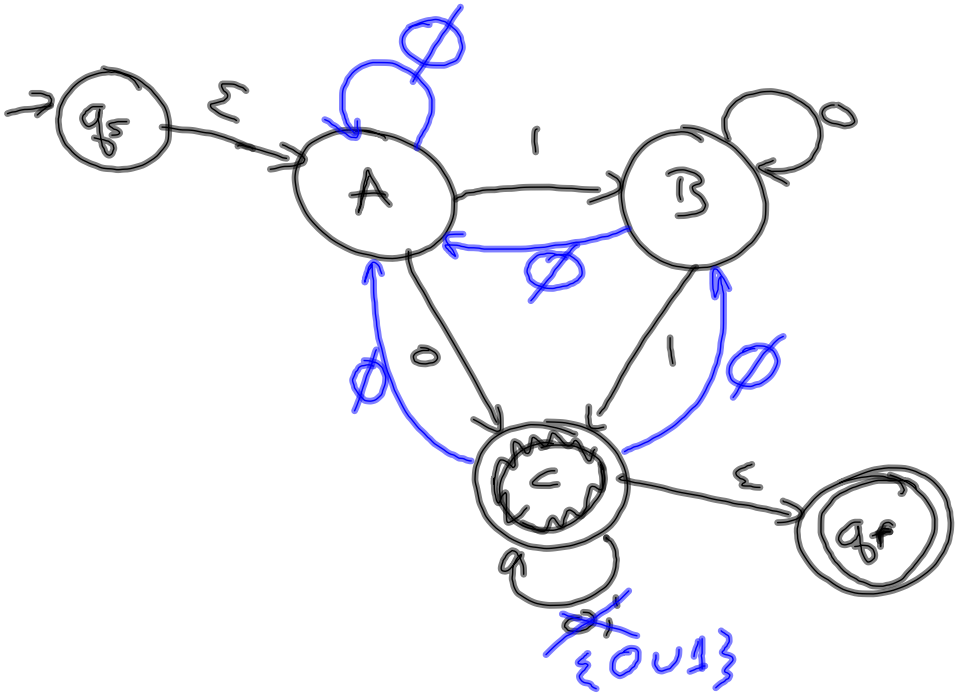
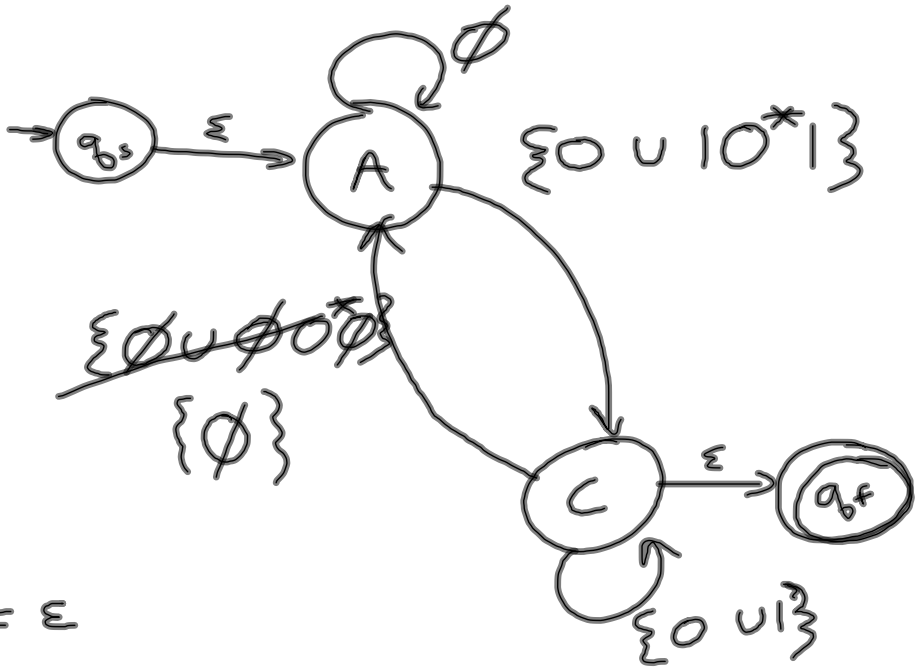
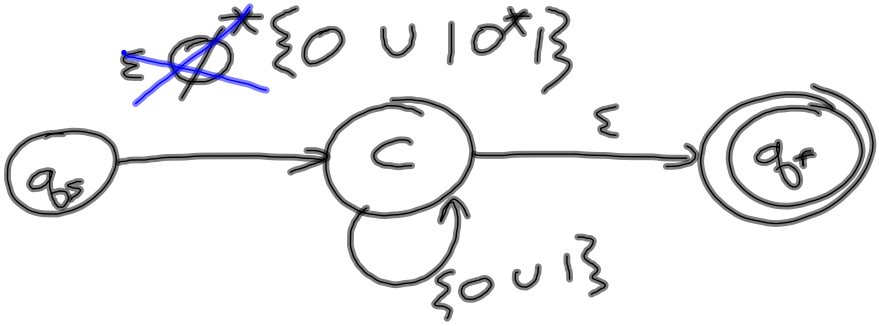
if a language is regular
then a reg. exp. describes it.

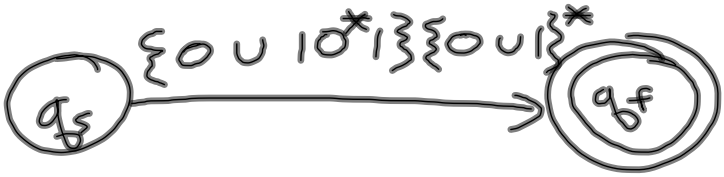
construct generalized
non-det. finite automata
(GNFA)

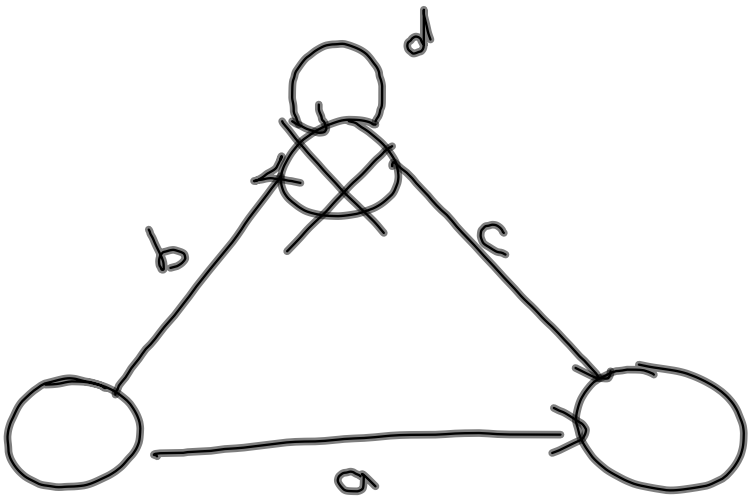


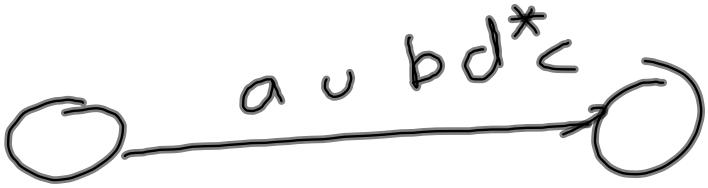


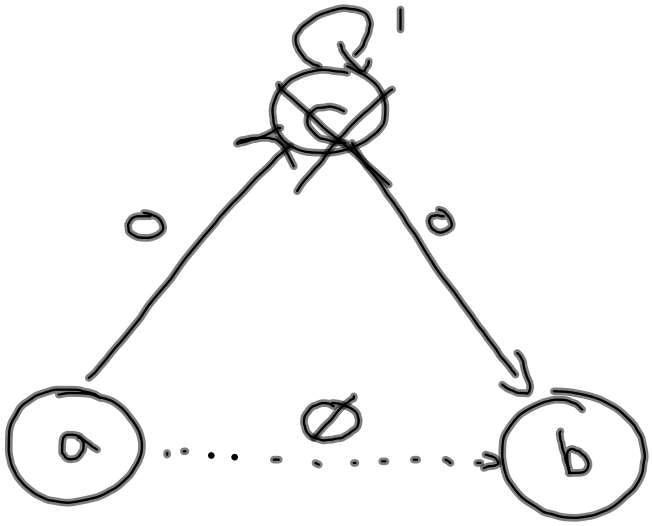
$\emptyset^* = \varepsilon$






d
b
c
a


a ∪ bd*c



$\cancel{\emptyset\emptyset} 01^*0$

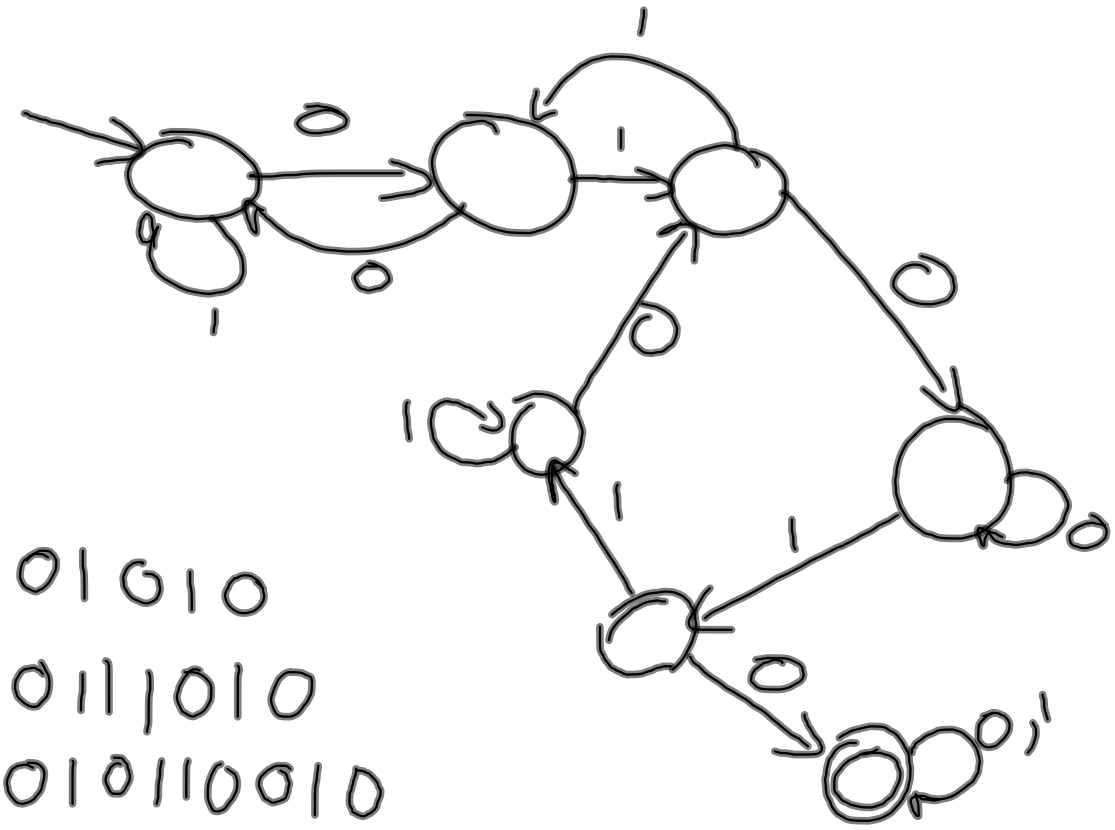
$$B = \{0^n 1^n \mid n \geq 0\}$$

$\{w \mid w$ has an equal number of 01 and 10 substrings$\}$

01100110

01011010

01000

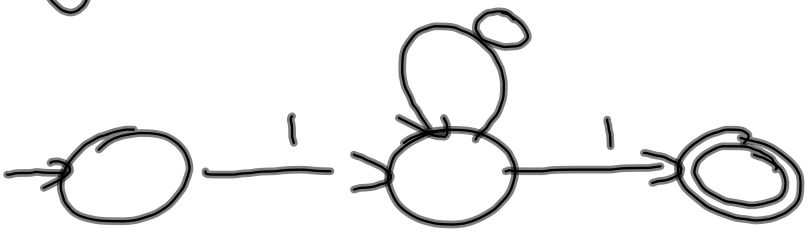


01010

01110

010110010

The Pumping Lemma



11

101

1001

100001

1000001

If A is a regular language then there is a number p where if $s \in A$ and $|s| \geq p$, then s may be divided into 3 pieces $s = xyz$ satisfying the following conditions:

1. for $i \geq 0$, $xy^iz \in A$
2. $|y| > 0$
3. $|xy| \leq p$