CS 321 Homework 1

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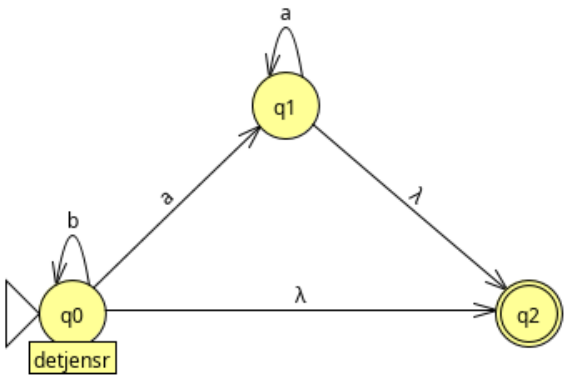
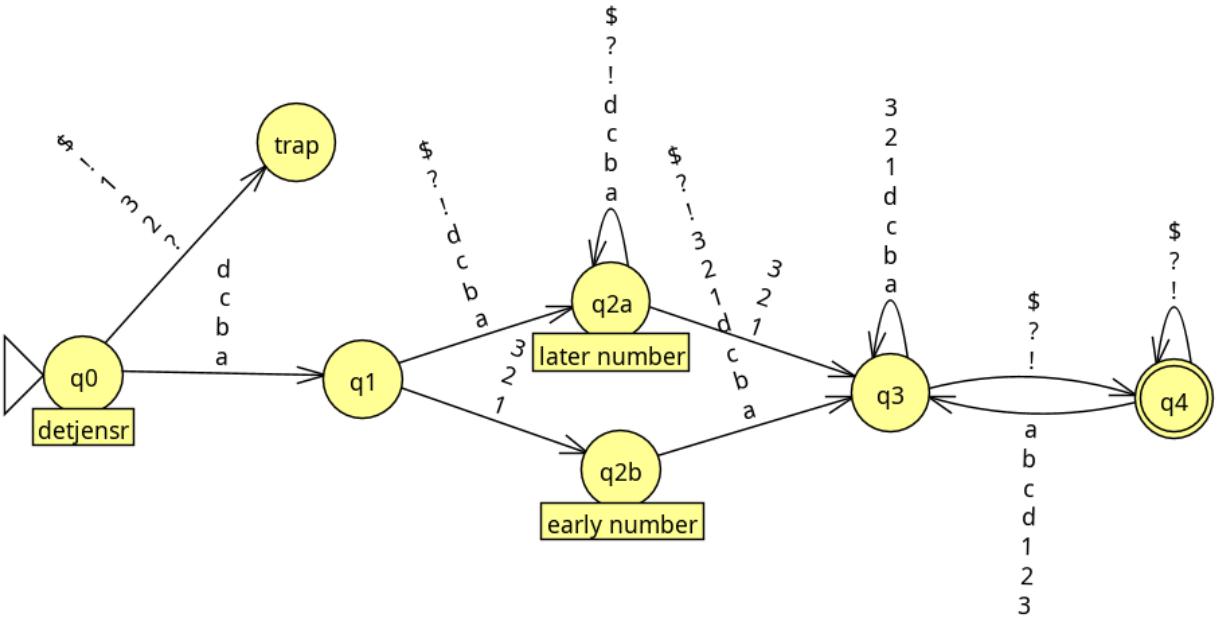
Construct an NFA with three states that accepts the language *L*.



Suppose that a bank only permits passwords that are strings from the alphabet `[abcd123!?$]`, etc. Construct a NFA/DFA for L.



A number is divisible by 3 if the sum of its digits is divisible by 3. Construct a DFA M that accepts a base-10 number if it is divisible by 3.

foo

For the DFA M below, give its formal definition as a quintuple. Verbally describe the language, L(M), accepted by M.

(Indented for clarity.)

```
M = (
  {q0,q1,q2,q3},
  {0,1},
  {
    Î´(q0, 0) = q1
    Î´(q0, 1) = q3
    Î´(q1, 0) = q1
    Î´(q1, 1) = q2
    Î´(q2, 0) = q2
    Î´(q2, 1) = q2
    Î´(q3, 0) = q1
    Î´(q3, 1) = q3
  },
  q0,
  {q1,q3}
)
```

Prove that the class of regular languages is closed under complementation. I.E. if L is a regular language then L*bar* is also a regular language.

bar