- Marcel Marceau ...
- office hours F1-5, BA3289.
- re-marks next week...

CSC236 fall 2012

regular languages, regular expressions

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Using Introduction to the Theory of Computation, Chapter 7

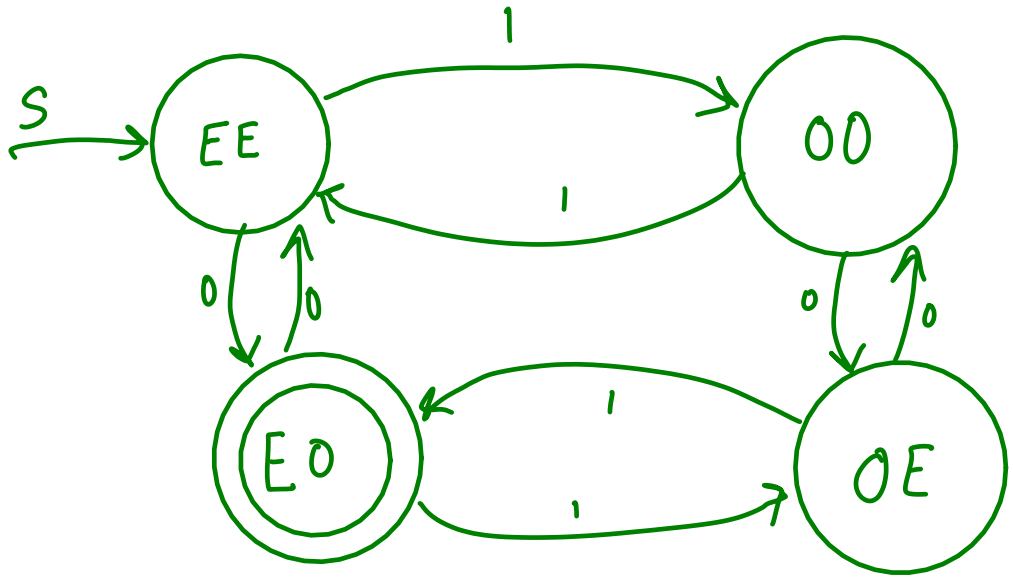
Outline

regular expressions, regular languages

notes

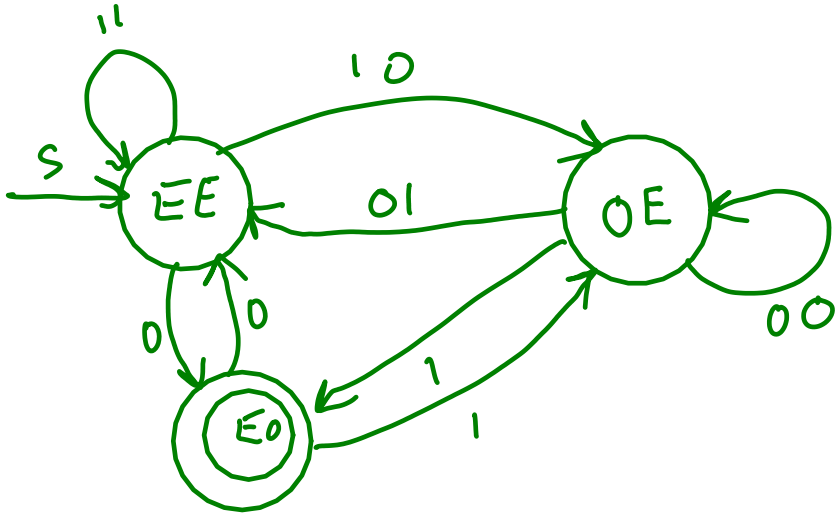
they're equivalent:

$L = L(M)$ for some DFSA $M \Leftrightarrow L = L(M')$ for some NFSA $M' \Leftrightarrow$
$L = L(R)$ for some regular expression R
step 1: convert $L(M)$ to $L(R)$, eliminate states



Even 1s, odd length

eliminate 00



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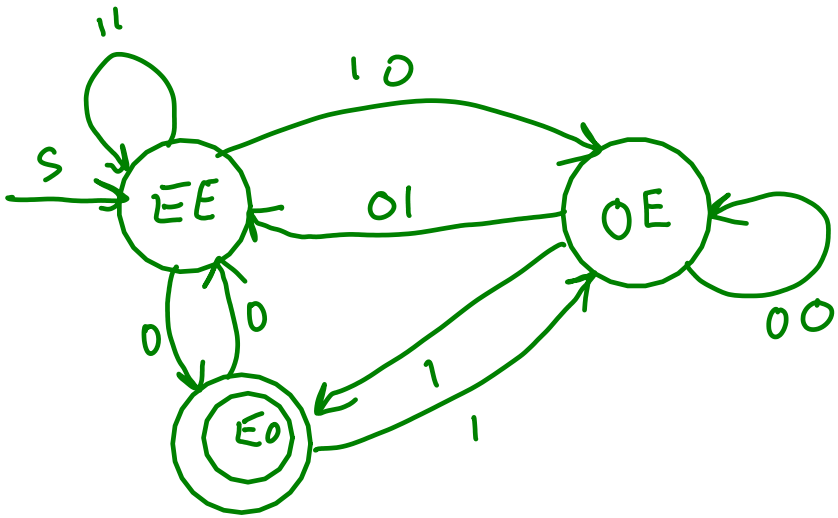
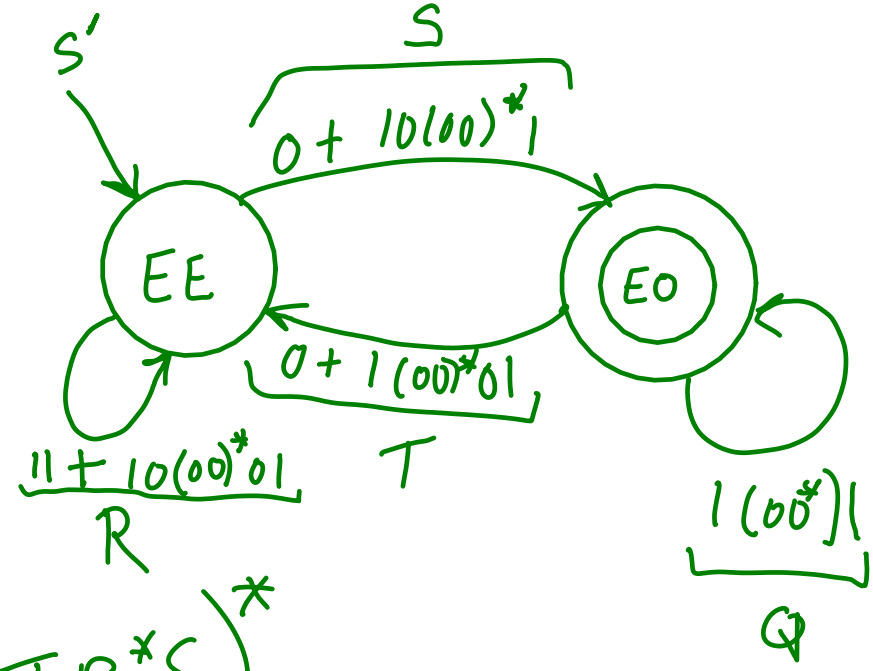




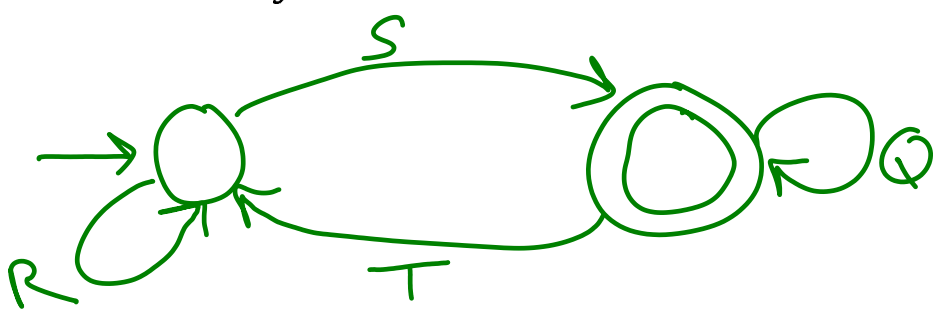
$$R^* S (Q + T R^* S)^*$$

dynamic (table based) program

equivalence. . .

state elimination recipe for state q

1. $s_1 \ldots s_m$ are states with transitions **to** q, with labels $S_1 \ldots S_m$
2. $t_1 \ldots t_n$ are states with transitions **from** q, with labels $T_1 \ldots T_n$
3. Q is any self-loop on q
4. Eliminate q, and add (union) transition label $S_i Q^* T_j$ from s_i to t_j.



regex

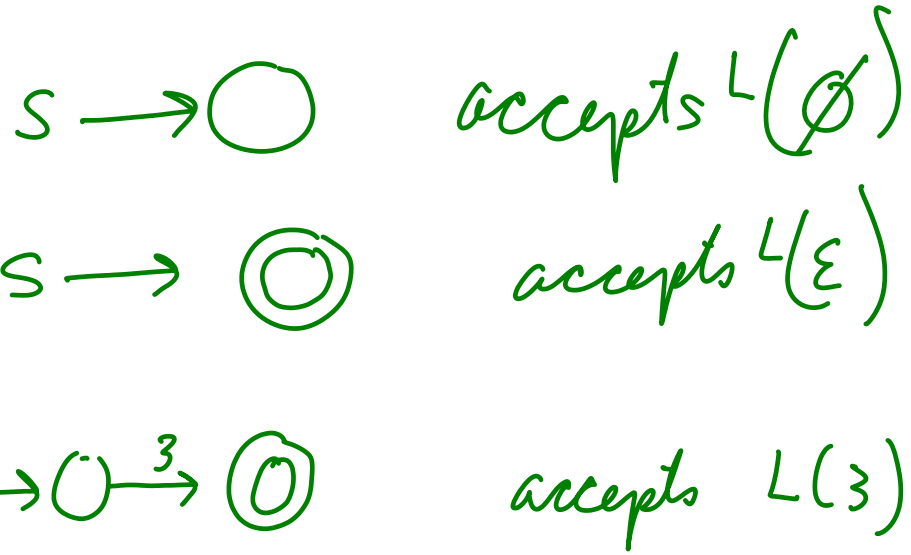
$R^*S(Q+TR^*S)^*$

equivalence:

step 2: convert $L(R)$ to $L(M)$:

start with $\emptyset$, ε, $a \in \Sigma$

$\Sigma = \{0, 3\}$



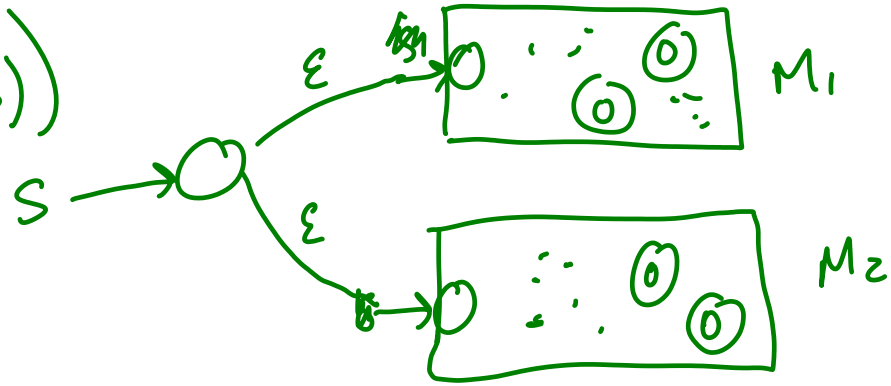
equivalence...

step 2.5: convert $L(R)$ to $L(M)$:

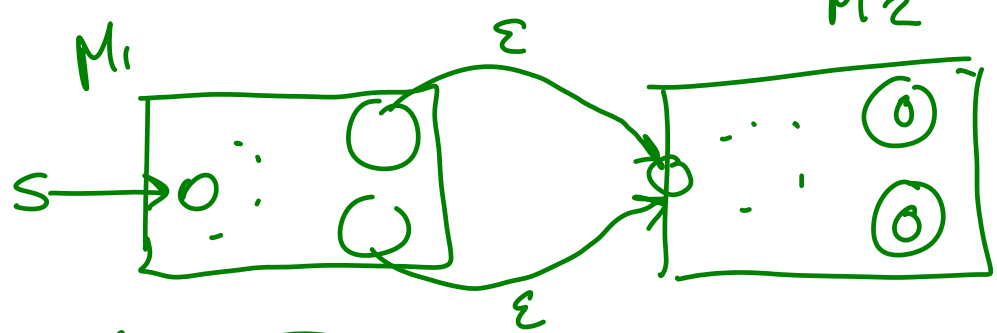
union, concatenation, stars

M_1 accepts $L(R)$, M_2 accepts $L(S)$

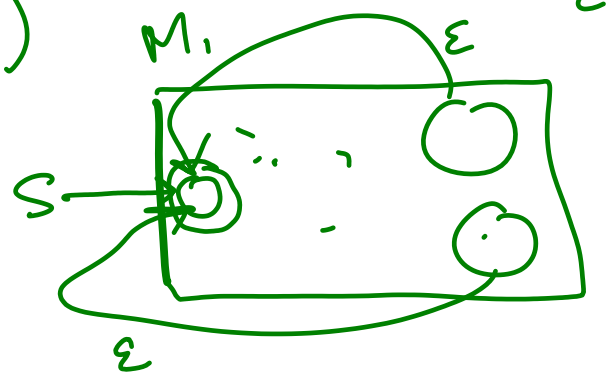
M accepts $(L(R+S))$



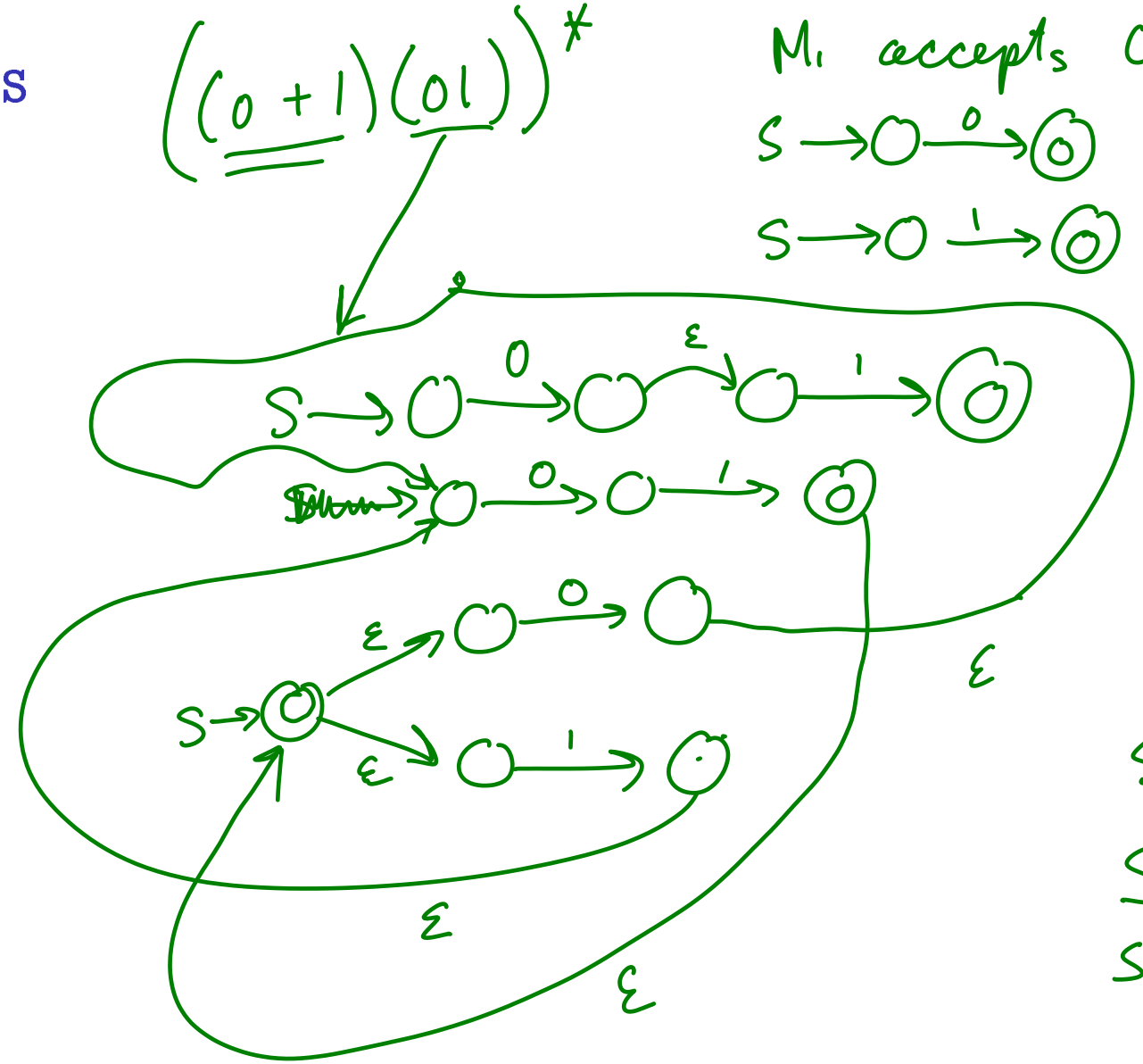
M accepts $L(RS)$



M accepts $L(R^*)$



notes


((0 + 1)(01))*
M1 accepts 0
M1
M2
e.g.
grep
Summer
Socks
sacks
Language L = {s ∈ {0,1}* | s = 1^n 0^n, n ∈ ℕ}