Recitation 3 - Homework 1

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Questions and examples related to homework 1.
Example Conversions: Regular Expression to/from NFAs and NFAs to DFAs.

Questions?

δ_1	0	1	ϵ
1	ϕ	$\{2\}$	ϕ
2	$\{3\}$	$\{2\}$	ϕ
3	ϕ	$\{3\}$	ϕ

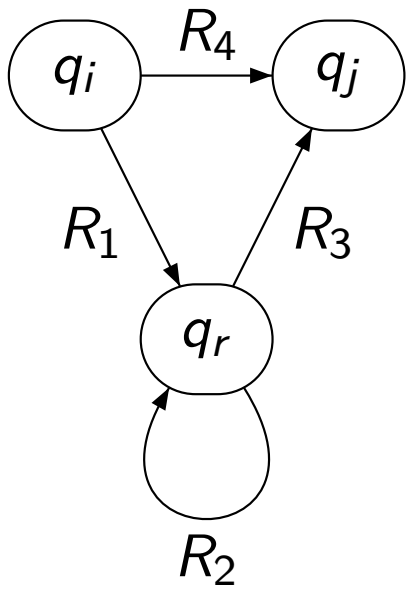
$\Downarrow\Downarrow\Downarrow$

δ	0	1	ϵ
1	ϕ	$\{2\}$	ϕ
2	$\{3\}$	$\{2\}$	ϕ
3	ϕ	$\{3\}$	$\phi \cup \{1\} = \{1\}$

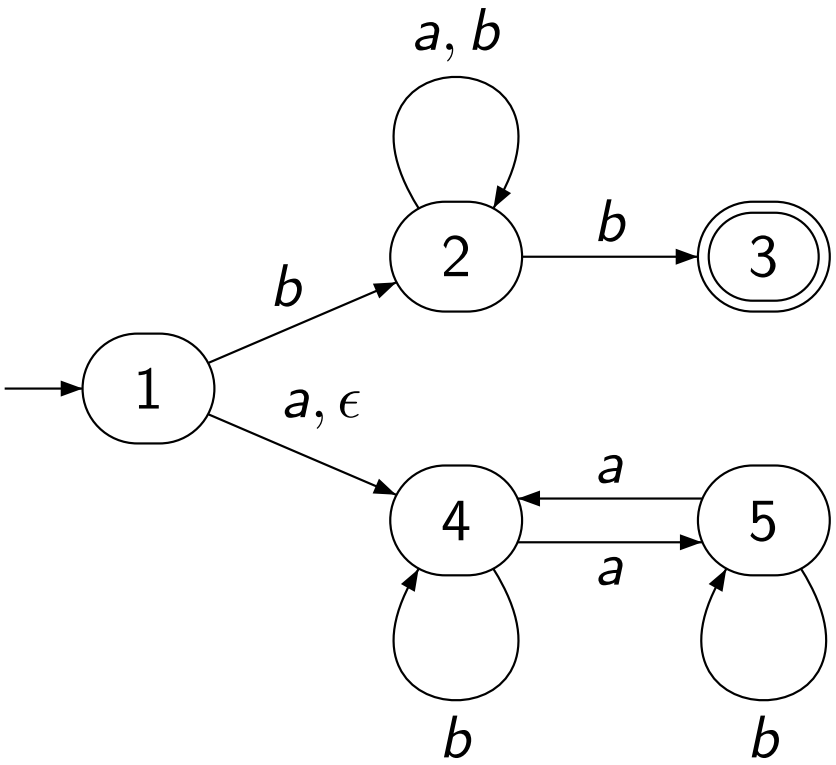
- This construction works for this example.
- Problem 1.15 ask for an example where this doesn't work.

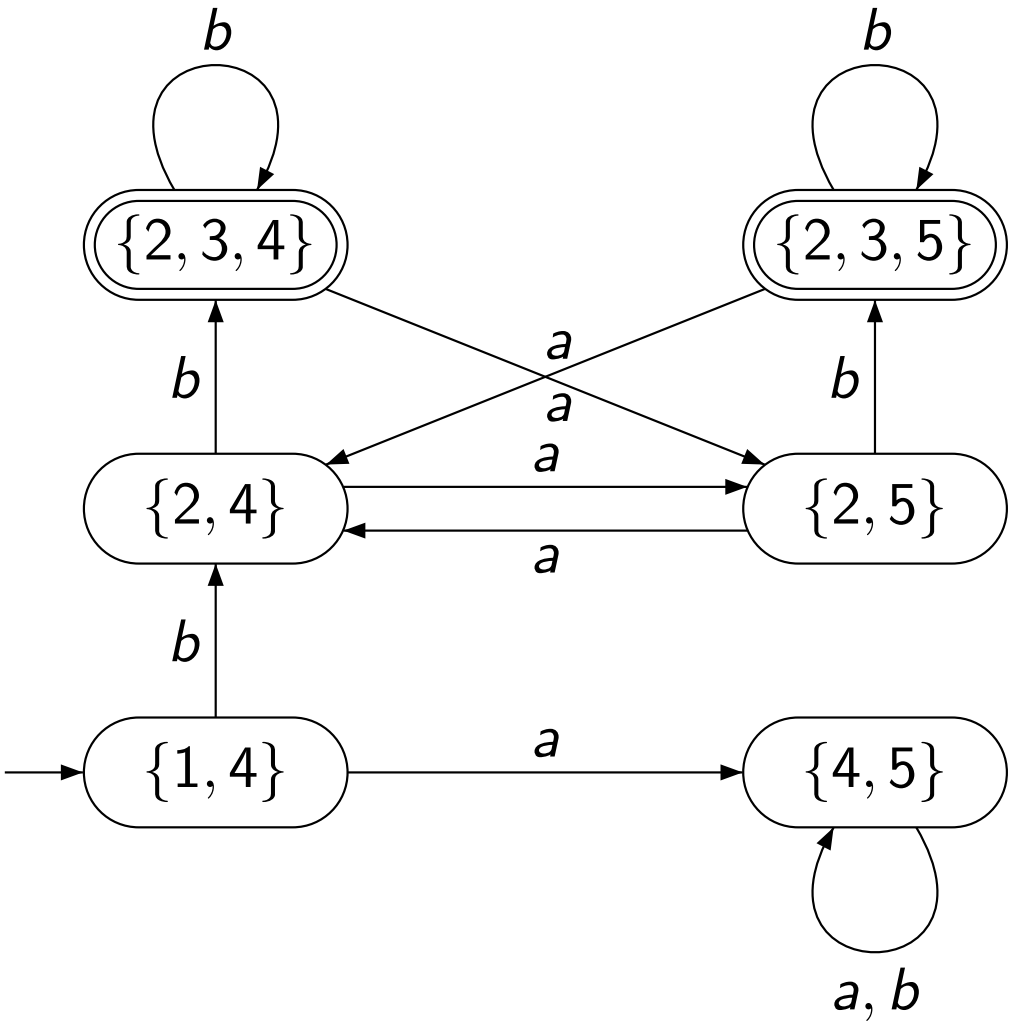
- If language A is regular, prove A^R is regular.
- Given DFA M which recognizes A, construct DFA or NFA M_1 which recognizes A^R.
- Remember to prove both ways:
  - Given $w \in A$, show M_1 accepts w^R, and given $w \notin A$, show w^R not accepted by M_1.
  - -or- Given $w \in A$, show M_1 accepts w^R, and given w accepted by M_1 show $w^R \in A$.

$$1 \cup (01^*0) = (1) \cup (0(((1)^*)0))$$



Remove R_1 and R_3 and replace R_4 with $R_1 R_2^* R_3 \cup R_4$.


a, b
b
2
b
3
b
1
a, ϵ
a
4
5
a
b
b


b
b
{2, 3, 4}
{2, 3, 5}
a
b
b
a
a
{2, 4}
{2, 5}
a
b
{1, 4}
a
{4, 5}
a, b