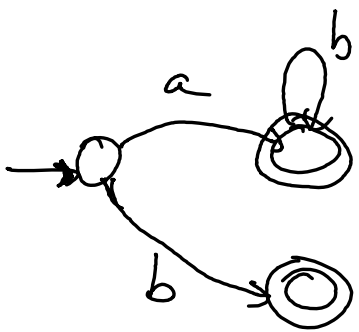
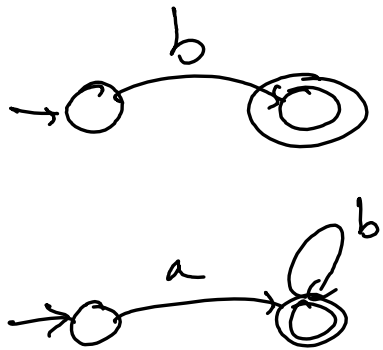
$(a|ba)^*$ = { a, aa, aaa, aaaa, ε, ba, baba, aba, aaba, baa, baba, abaa ... }

~~aaab~~

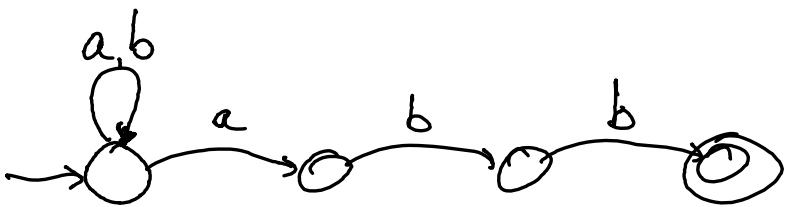
$ab^*|b$ = { b, abb, abbb, ab, a }





$(a|b)^*|abb = \{aabb, babb, abb\}$

aa abb
ab abb
⋮
~~abbb~~



$(a|\varepsilon)^* \, d \, d^* = \{d, aaad, dddd, aadd, ad, add, addd \ldots$
$d, dd, ddd,$

$(a|\varepsilon)^* = \{\varepsilon, a, aa, \cancel{a\varepsilon}, \cancel{aad}, aaa \ldots\} = a^*$

$a|\varepsilon = \{a, \varepsilon\}$

$\underbrace{(a|\varepsilon)^*}\ \underbrace{d}\ \underbrace{d^*}$

$d = \{d\}$

$d^* = \{\varepsilon, d, dd, ddd \ldots\}$

$(xd \mid \varepsilon)^* d^* = \{xdd, xddd, dddd, ddd, dd, d,$
$\cancel{xxdd}, xd, xdxd, \varepsilon\}$

$a^*(b|c)d^* = \{b, c, ab, ac, bd, cd,$
$abd, acd, aab, aac,$
$bdd, cdd,$
$aaab, aaac, bddd, cddd,$
$aabd, aacd, abdd, acdd\}$

Ex 5

a. $va(is|s|\varepsilon) = va(is|s)^* = \{va, vas, vais, vasis, vassis, vasissis \dots\}$

$(va(is|s))^* = \{vasvas, vavais, \dots\}$

$va(is|s^*) = \{vais, va, vas, vas, vas \dots\}$?

$va(i^*s) = \{vas, vais, vaais, vaiis \dots\}$?

→ $v(a|ais|as)$

→ $(va|vais|vas)$

b. (H|h)ouse

$\equiv$ boo*m, bo+m $\longmapsto$

$r^+ \equiv rr^*$

f. SnCf

g. (a|b|c|d|e...|z)*ing

extensions: [a-z]*ing

letter $\in \{a, b \ldots z\}$

$r^+ = rr^*$

$r^? = (r|\varepsilon)$

interest $(s|(ed|ing)(ly)^?)^?$

interest $\emptyset$

interest
- s
  - ed ~~(ly)~~ X
  - ing ~~(ly)~~