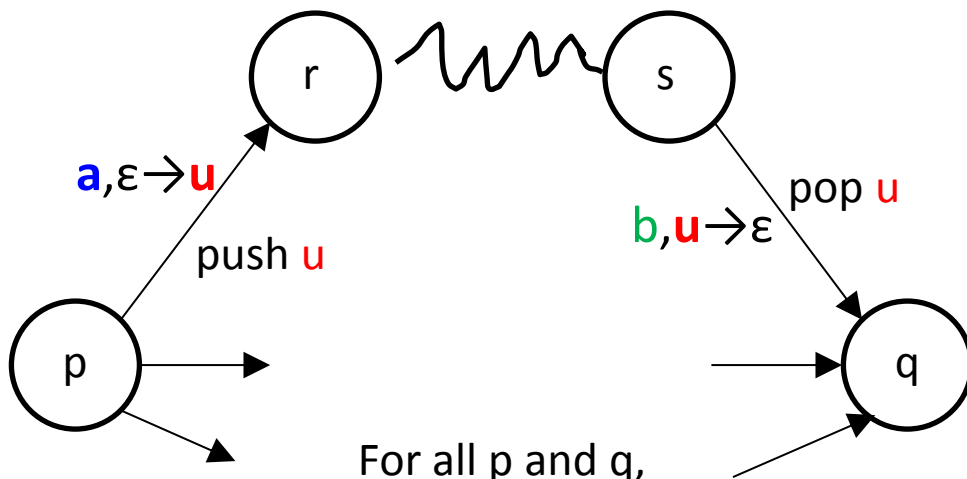Preparation
Step 1: if multiple accept states. add new accept state
Step 2: add extra transitions (and states) if necessary
         to ensure empty stack at accept
Step 3: ensure each transition is either a push or a pull

Rule Generation Step 1

a,ε→**u**

push u

b,**u**→ε

pop u

For all p and q,
and where there is a ***push*** of some u leaving p
and a ***pop*** of that <u>same</u> u leaving some s

add rule A_{pq} -> aA_{rs}b
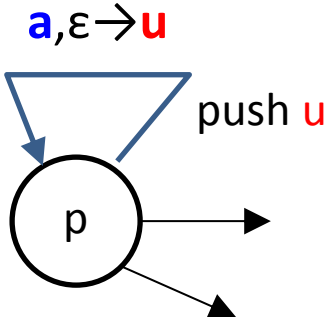
Note: you can skip all states s that clearly <u>do</u>
<u>not</u> have a path from r, as that A_{rs} is φ

Rule Generation Step 2: For all p,q,r add A_{pq}->$A_{pr}A_{rq}$

Note: again skip any combination where there
is clearly no path, as that is φ

Rule Generation Step 3: For all p add A_{pp}-> ε

What About Self Loops that Push?

$a, \varepsilon \rightarrow u$

push u

p

Answer: make state r = state p

r=p

s

$a, \varepsilon \rightarrow u$

push u

$b, u \rightarrow \varepsilon$

pop u

p

q

add rule $A_{pq} \rightarrow a A_{ps} b$