

$A = (\{\#, a, b\}, \{q, v\}, \{a, b, \varepsilon\}, \delta, \#, q, \{v\})$

1.  $\#qa \rightarrow \#aq$

2.  $\#qb \rightarrow \#bq$

3.  $aq a \rightarrow aaq$

4.  $bqb \rightarrow bbq$

5.  $aqb \rightarrow q$

6.  $bqa \rightarrow q$

7.  $\#q\varepsilon \rightarrow \#v$