

### Example 6.4.1

An NFA  $M$  is given, along with three distinct computations for the string  $ababb$ .

$$M : Q = \{q_0, q_1, q_2\}$$

$$\Sigma = \{a, b\}$$

$$F = \{q_2\}$$

$\delta$	$a$	$b$
$q_0$	$\{q_0\}$	$\{q_0, q_1\}$
$q_1$	$\emptyset$	$\{q_2\}$
$q_2$	$\emptyset$	$\emptyset$

$[q_0, ababb]$   
 $\vdash [q_0, babb]$   
 $\vdash [q_0, abb]$   
 $\vdash [q_0, bb]$   
 $\vdash [q_0, b]$   
 $\vdash [q_0, \lambda]$

$[q_0, ababb]$   
 $\vdash [q_0, babb]$   
 $\vdash [q_1, abb]$

$[q_0, ababb]$   
 $\vdash [q_0, babb]$   
 $\vdash [q_0, abb]$   
 $\vdash [q_0, bb]$   
 $\vdash [q_1, b]$   
 $\vdash [q_2, \lambda]$

The second computation of the machine  $M$  halts after the execution of three instructions since no action is specified when the machine is in state  $q_1$  scanning an  $a$ . The first computation processes the entire input and halts in a rejecting state while the final computation halts in an accepting state.  $\square$