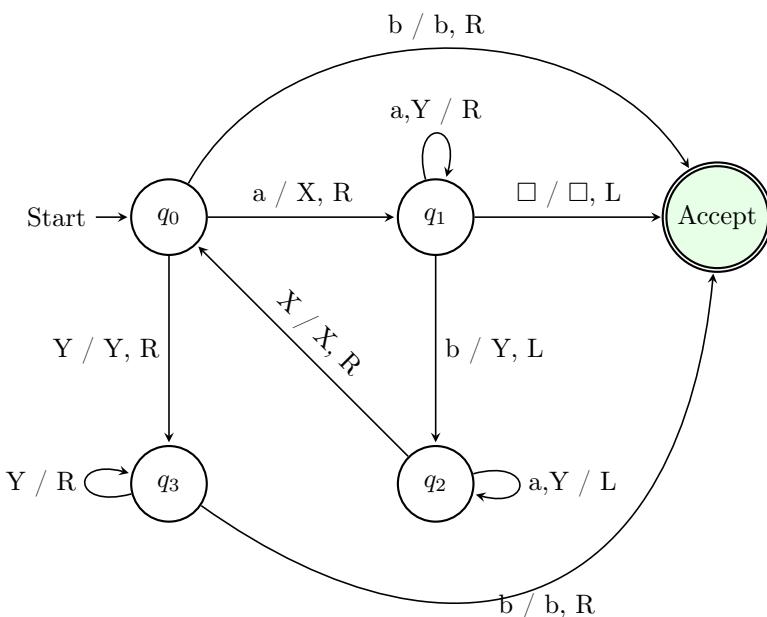
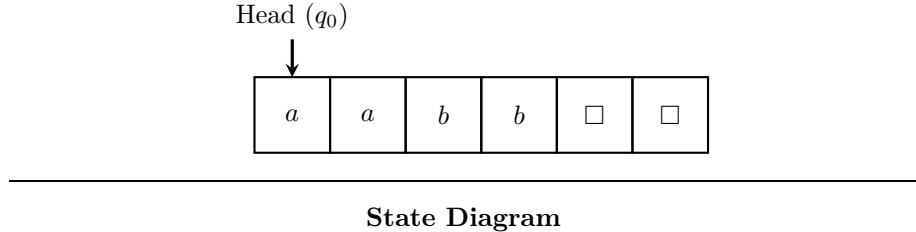


## Decider TM for $L = \{a^n b^n \mid n \geq 0\}$

Execution Example (Initial Tape)



**Machine Strategy**

1.  $q_0$ : Mark an 'a' as X, move right to find 'b'.
  2.  $q_1$ : Skip a's and Y's, mark 'b' as Y, go left.
  3.  $q_2$ : Return left to X, restart from  $q_0$ .
  4.  $q_3$ : Verify remaining Y's after all a's marked.
  5. Accept if all a's matched with b's.
- Alphabet:  $\Sigma = \{a, b\}$  | Tape:  $\Gamma = \{a, b, X, Y, \square\}$