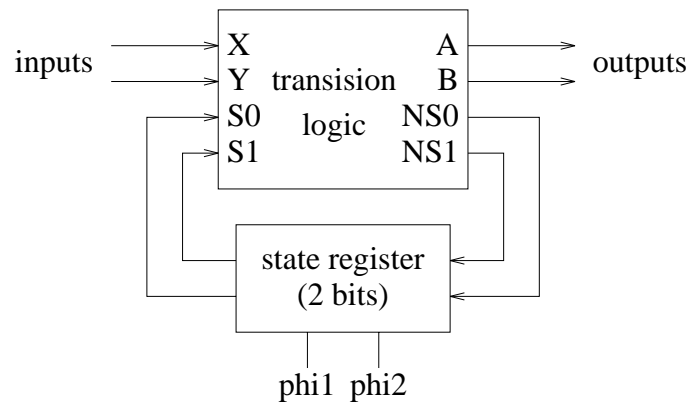


## Reverse Engineering a State Machine

A state machine implementation is shown below:



The simplified logical expressions for the transition logic are:

$$A = (X + \bar{Y}) S_0 S_1 \quad B = X S_0 \bar{S}_1 \quad NS_0 = \bar{X} (\bar{S}_0 + S_1) \quad NS_1 = X + Y S_0$$

**Part A** Derive the state transition table from this implementation (i.e., use the transition logic expressions above to complete this truth table.)

$S_1$	$S_0$	$Y$	$X$	$NS_1$	$NS_0$	$B$	$A$
0	0	0	0				
0	0	0	1				
0	0	1	0				
0	0	1	1				
0	1	0	0				
0	1	0	1				
0	1	1	0				
0	1	1	1				

$S_1$	$S_0$	$Y$	$X$	$NS_1$	$NS_0$	$B$	$A$
1	0	0	0				
1	0	0	1				
1	0	1	0				
1	0	1	1				
1	1	0	0				
1	1	0	1				
1	1	1	0				
1	1	1	1				

**Part B** Derive the state diagram from the state table for this implementation.

