

$\Rightarrow$  7 states (3 bits register)

$\Rightarrow a$  is input. ( $a_2, a_1, a_0$ )

$\Rightarrow$  outputs  $\rightarrow xyz$  ( $n_2, n_1, n_0$ )

	$a_2$	$a_1$	$a_0$	$a$	$n_2$	$n_1$	$n_0$	$x$	$y$	$z$
$S_0$	0	0	0	0	0	0	0	0	0	0
	0	0	0	1	0	0	1	0	0	1
$S_1$	0	0	1	0	0	0	1	0	1	1
	0	0	1	1	0	1	0	1	1	1
$S_2$	0	1	0	0	0	1	0	1	1	1
	0	1	0	1	0	1	1	1	1	0
$S_3$	0	1	1	0	1	0	0	0	1	0
	0	1	1	1	1	0	0	0	0	1
$S_4$	1	0	0	0	1	0	1	0	0	1
	1	0	0	1	1	0	1	1	0	1
$S_5$	1	0	1	0	1	1	0	1	0	1
	1	0	1	1	1	1	0	1	0	0
$S_6$	1	1	0	0	1	1	0	1	0	0
	1	1	0	1	0	0	0	1	0	0
undf. (000)	1	1	1	0	0	0	0	0	0	0
	1	1	1	1	0	0	0	0	0	0



States	$a_2$	$a_1$	$a_0$
$S_0$	0	0	0
$S_1$	0	0	1
$S_2$	0	1	0
$S_3$	0	1	1
$S_4$	1	0	0
$S_5$	1	0	1
$S_6$	1	1	1

for  $x$ :

$a_2 a_1$	$a_0 = 00$	$01$	$11$	$10$
$00$				
$01$	1	1		
$11$	1	1		
$10$			1	1

$$x = a_1 a_0' + a_2' a_1' a_0$$

for  $y$ :

$a_2 a_1$	$a_0 = 00$	$01$	$11$	$10$
$00$			1	1
$01$	1	1	1	1
$11$				
$10$				

$$y = a_2' a_0 + a_2' a_1$$

for  $n_2$ :

$a_2 a_1$	$a_0 = 00$	$01$	$11$	$10$
$00$			1	
$01$				
$11$	1			
$10$	1	1	1	1

$$n_2 = a_2' a_1 a_0 a' + a_2 a_1' + a_2 a_0' a'$$

for  $n_1$ :

$a_2 a_1$	$a_0 = 00$	$01$	$11$	$10$
$00$			1	
$01$	1	1		1
$11$	1			
$10$			1	

$$n_1 = a_1' a_0 a + a_2' a_1 a_0' + a_2 a_1 a' + a_1 a_0' a'$$

for  $z$ :

$a_2 a_1$	$a_0 = 00$	$01$	$11$	$10$
$00$			1	1
$01$	1	1		
$11$				
$10$	1	1	1	1

$$z = a_1' a_0 + a_2' a_1 a_0' + a_2 a_1'$$

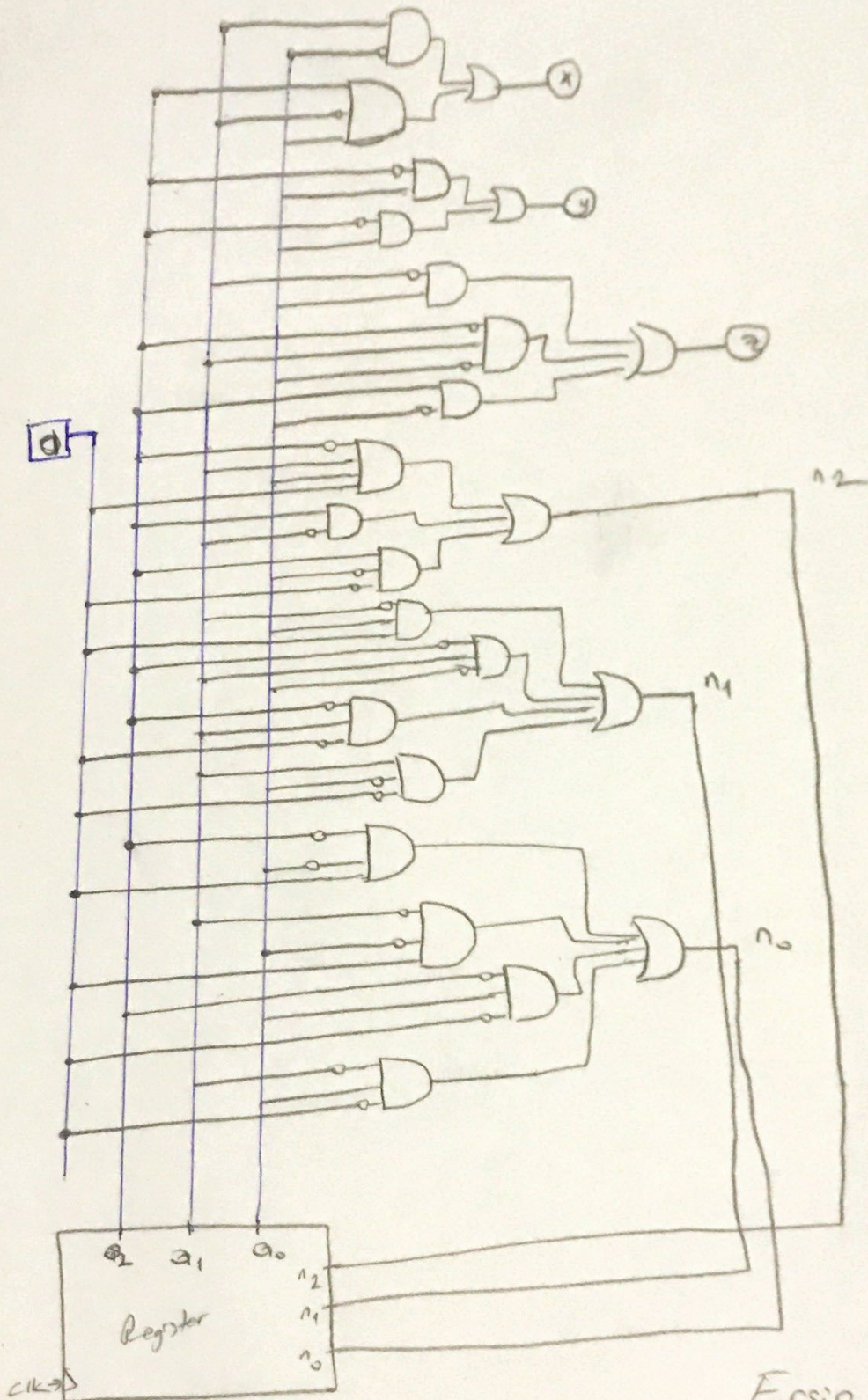
for  $n_0$ :

$a_2 a_1$	$a_0 = 00$	$01$	$11$	$10$
$00$	1			1
$01$		1		
$11$				
$10$	1			1

$$n_0 = a_1' a_0' a + a_1' a_0 a' + a_2' a_0' a + a_2' a_0 a'$$



# Combinational Circuit



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