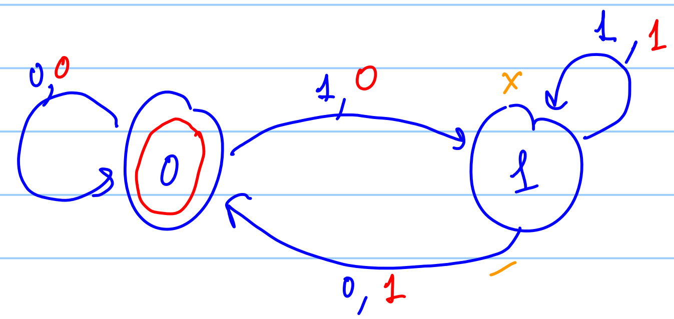
Note Title 12/4/2013

Input: $q_1 q_2 \cdots q_k$ $\qquad I = \{0, 1\}$

Output: $0\, q_1 q_2 \cdots q_{k-1}$ $\qquad O = \{0, 1\}$



1 1 0 1 input

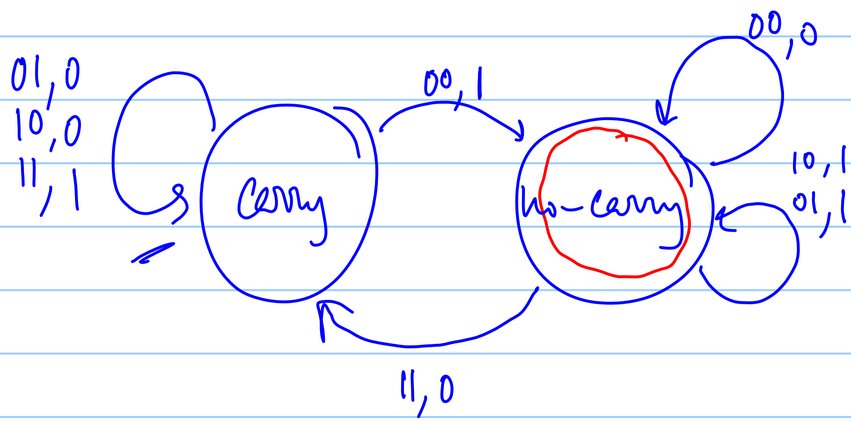
0 1 1 0 output

0 1 1 0

$$\begin{array}{r} 0\,1\,1\,0\,1 \\ 0\,0\,1\,1\,0 \\ \hline 1\,0\,0\,1\,1 \end{array}$$

$I = \{00, 01, 10, 11\}$

$O = \{0, 1\}.$



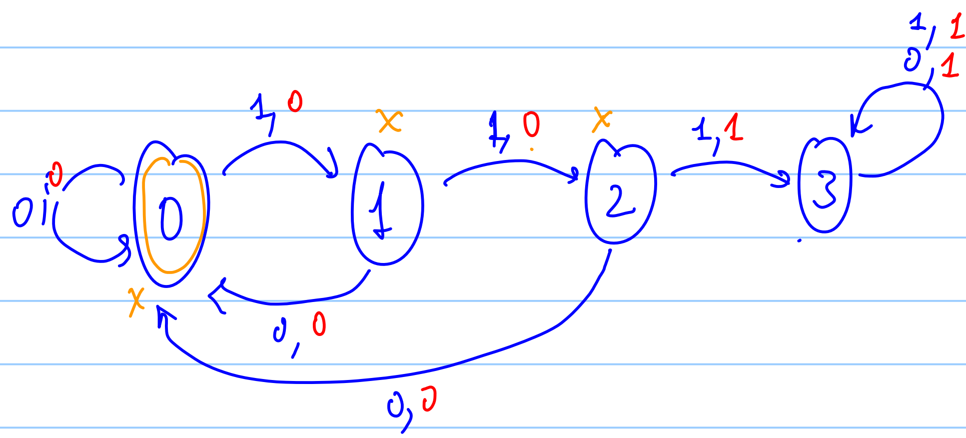
Input: binary string

Output: last bit is 1 iff '111' occurs in the input string.

$I = O = \{0,1\}$

0 1 0 1 0 1 1 0 1
x x x . . . . x 0

0 1 1 1 0 1 0 1 1
x x x . . . x 1



length of string of 1's.

0 1 1 0

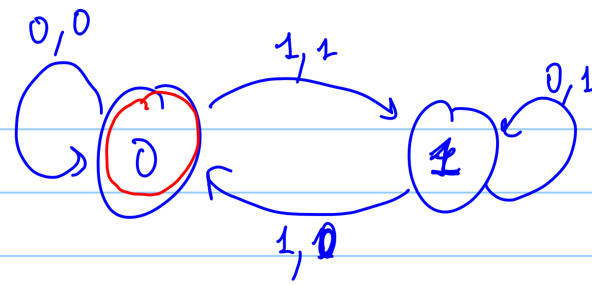
0 1 1 1
0 0 0 1

Parity of String = 1 if # 1's is odd
0 if # 1's is even.

1 0 1 1 0 1 0 → 0
1 1 0 1 1 1 0 → 1

Last output bit is parity of ~~bits~~ input bits seen so far.

$I = O = \{0,1\}$

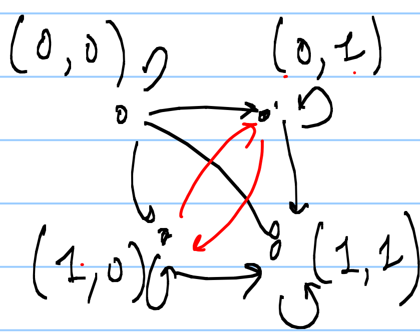


Quiz 7

SELECT[Day = "Thursday" $\wedge$ Dept = "Swimming"]

$\Rightarrow$ PROJECT[Course Name]

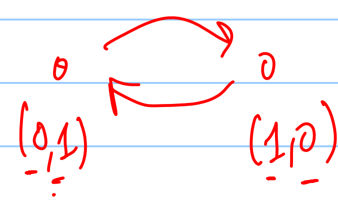
Quiz 6: ~~3~~ 4,



$a \le c \le e$

$b \le d \le f$

$(a,b) \le (c,d) \le (e,f)$.



x	y	$x \to y$
0	0	1
0	1	1
1	0	0
1	1	1

$\{\neg, \to\}$ functionally complete.

$\{\cdot, \neg\}$

$\{+, \neg\}$

$\{\downarrow\}$

$\{\uparrow\}$

- $x \rightarrow y \equiv \bar{x} + y$ Show $\bar{\ }$, $\cdot$ + can be expressed using $-$ $\rightarrow$

$\bar{x} \rightarrow y \equiv \bar{\bar{x}} + y \equiv x + y$

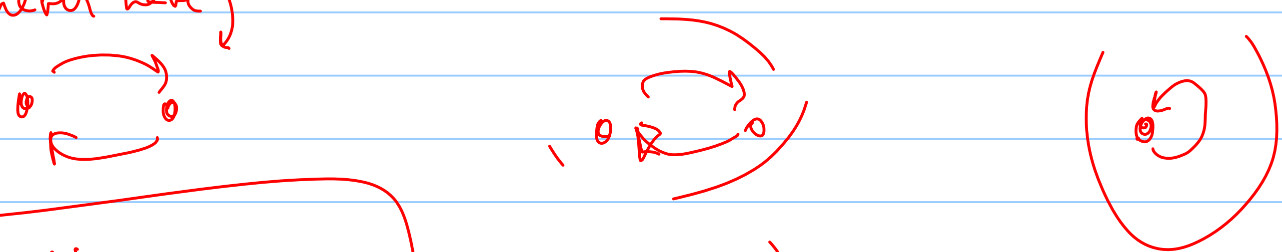
$x + y \equiv (\bar{x} \rightarrow y)$

uses only $\rightarrow$ $\cdot$ $-$

Anti-symmetric relation.

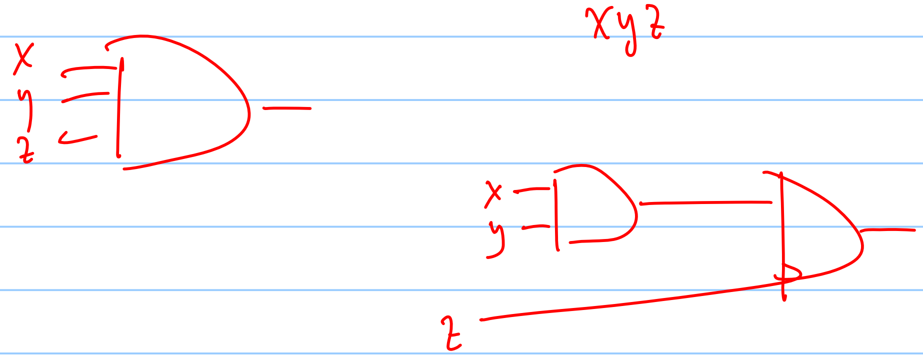
$\underbrace{xRy \wedge yRx}$ $\Rightarrow$ $x = y$.

never have



Symmetric

xyz



$r_0 = 30$

$r_1 = (30)(1.12)$

$r_2 = (30)(1.12)(1.12) = (30)(1.12)^2$

$\vdots$

$r_k = (30)(1.12)^k$

$$r_0 + r_1 + \cdots + r_9 = \sum_{k=0}^{9} \underline{(10)(30)}(1.12)^k$$

$$300 \frac{\left[(1.12)^{10} - 1\right]}{1.12 - 1}$$