

COL215L: Digital Logic & System Design

Lecture 15: Binary Arithmetic (Cont.)



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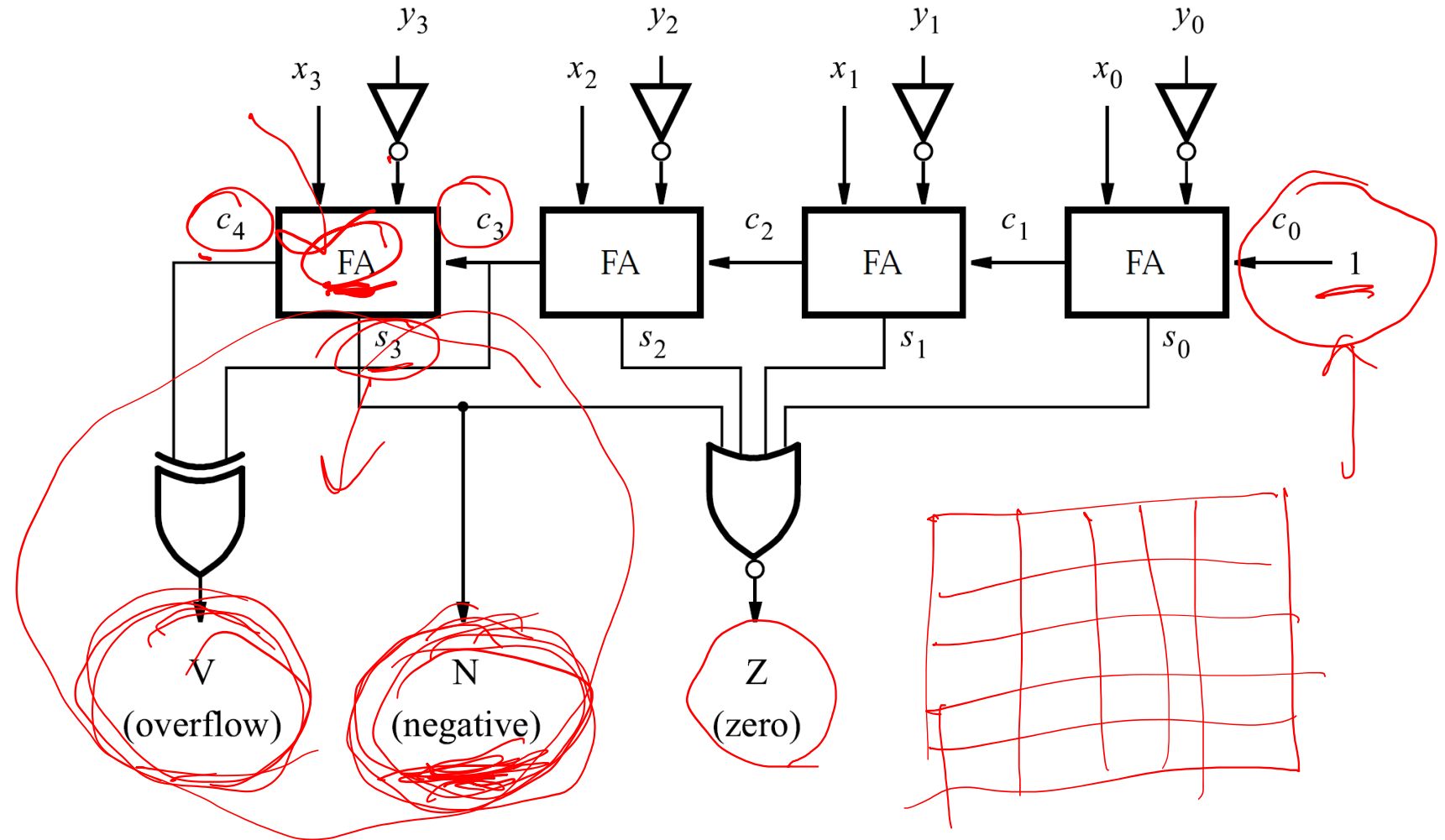
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Comparator

x_1 y_1 -
 $x = y$
 $x > y$
 $x < y$

$$x - y$$

2^i complement
 $x + (-y)$



Parity Generation

- Even parity bit
 - 1 if number of 1's in the data bits is even

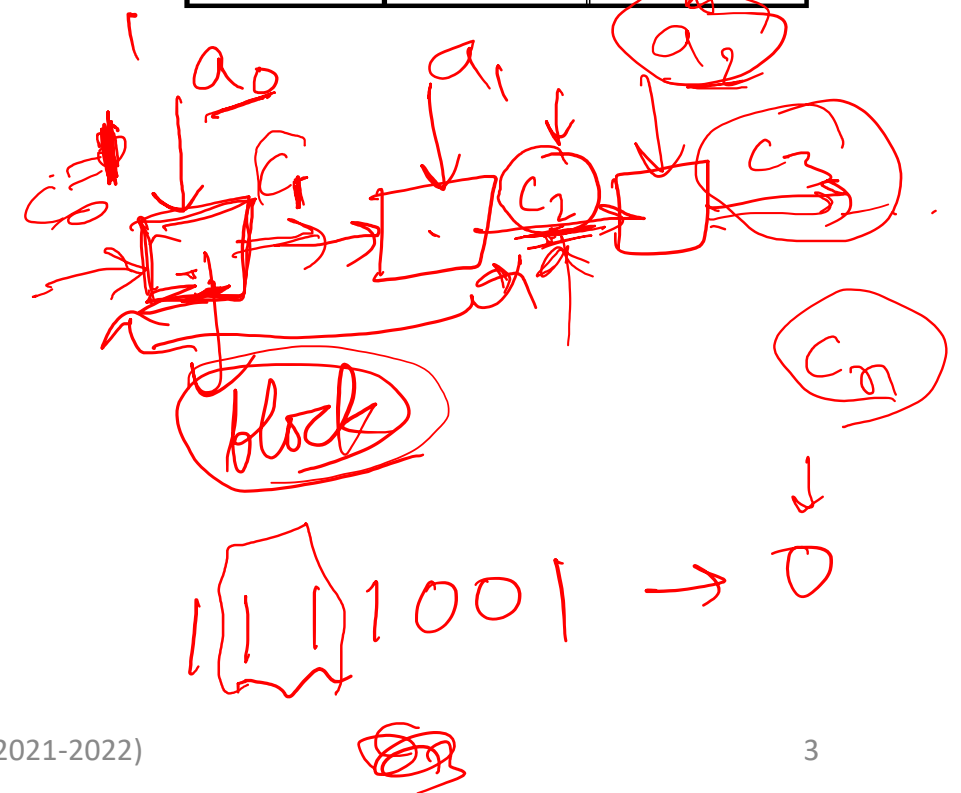
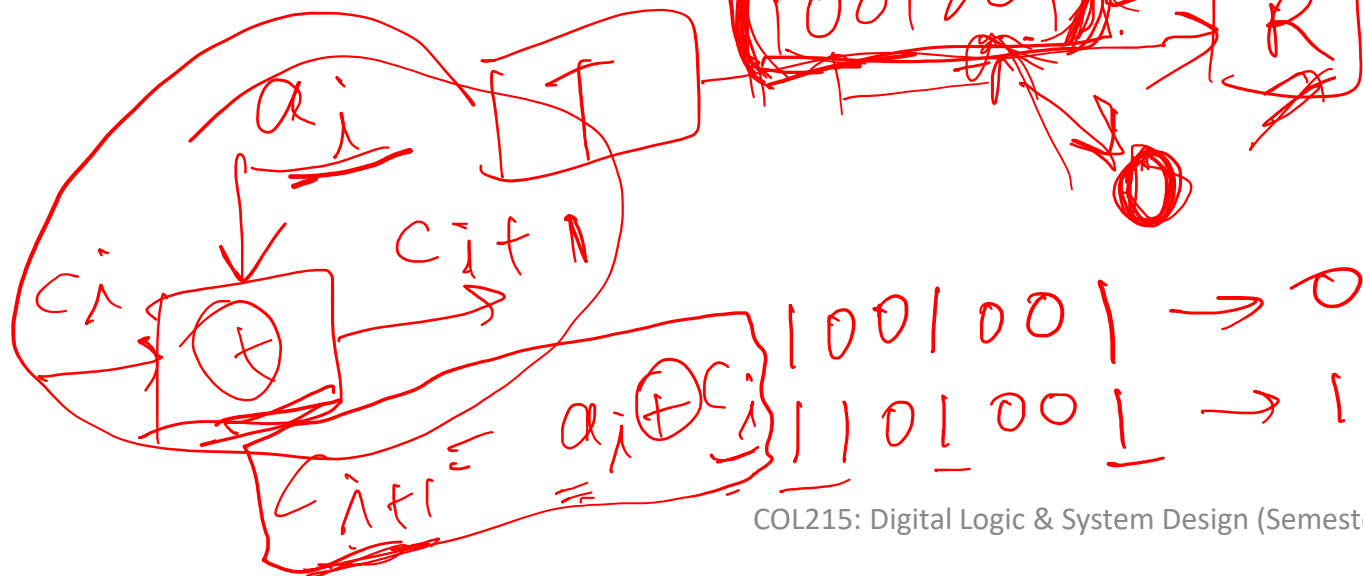


1 bit odd
even

C_i	a_i	C_{i+1}
0	0	0
0	1	1
1	0	1
1	1	0

$A = a_{n-1} a_{n-2} \dots a_1 a_0$

parity bit



Pattern Recognition

- Example

- Detect 1011

- Basic Method

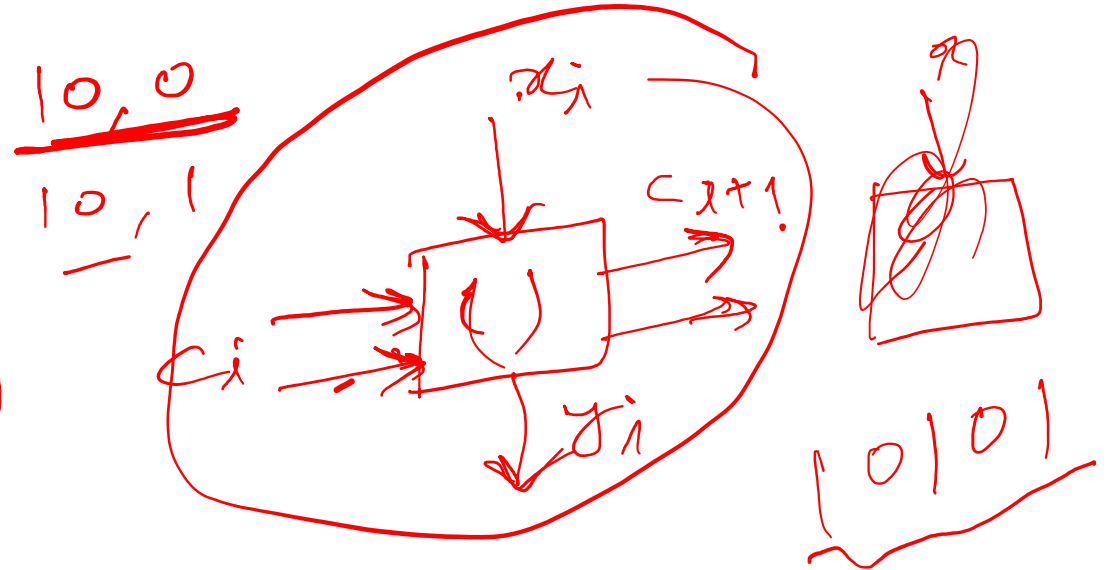
- Input: 101101101010
 - Output: 00010010000

- Another Method (Define c_i)

- 00 (if no bit match till now)
 - 01 (if one-bit match till now)
 - 10 (if two-bit match till now)
 - 11 (if three-bit match till now)

$\log n$

5 bit



c_i	x_i	c_{i+1}	y_i
00	0	00	0
00	1	01	0
01	0	10	0
01	1	01	0
10	0	00	0
10	1	11	0
11	0	10	0
11	1	01	1