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CSC 211

<u>Project 1 - Report</u>

a[7:4]\a[3:0]	0000	0001	0011	0010	0110	0111	0101	0100	1100	1101	1111	1110
0000	0	0	0	0	0	0	0	0	0	0	0	0
0001	0	0	0	0	0	0	0	0	0	0	0	0
0011	1	1	1	1	1	1	1	1	1	1	1	1
0010	1	1	1	1	1	1	1	1	1	1	1	1
0110	1	0	0	0	0	0	0	0	0	0	0	0
0111	0	0	0	0	0	0	0	1	1	1	1	0
0101	0	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0
1100	0	0	0	0	0	0	0	0	0	0	0	0
1101	0	0	0	0	0	0	0	0	0	0	0	0
1111	1	1	1	1	1	1	1	1	1	1	1	1
1110	1	1	1	1	1	1	1	1	1	1	1	1
1010	1	1	1	1	1	1	1	1	1	1	1	1
1011	1	1	1	1	1	1	1	1	1	1	1	1
1001	0	0	0	0	0	0	0	0	0	0	0	0
1000	0	0	0	0	0	0	0	0	0	0	0	0

Project is meant to make any ascii uppercase. The lower and upper differ by 1 bit in the 5th position. Non letters stay the same.

The Kmap shows 1 when it is a lowercase. Thus we have

- $a_7 a_5$
- $a_7' a_6' a_5$
- $a_7' a_6 a_5 a_4 a_3 a_2$

- $a_7' a_6 a_5 a_4 a_3 a_2' a_1 a_0$
- $a_7' a_5 a_4' a_3' a_2' a_1' a_0'$

All have a5 as 1.
- Our equation can then be simplified.

- Minimum input delay after testing is ~15ns.

```
(base) apostolitsano@Apostolis-MacBook-Air-3 csc 211  % gtkwave toUp
per.vcd

GTKWave Analyzer v3.4.0 (w)1999-2022 BSI

[0] start time.
[335000000000000] end time.
```

Time				
	0	100 ns	200 ns	300 ns	400
a[7:0] =28	28			
b[7:0] =xx	X8	28		

Time				
0		100 ns		200 ns	300

a[7:0] =28 28

b[7:0] =xx + X8 28

From: 0 sec   To: 15 ns

Time															
	0	1 ns	2 ns	3 ns	4 ns	5 ns	6 ns	7 ns	8 ns	9 ns	10 ns	11 ns	12 ns	13 ns	14 ns	15 ns

a[7:0] =28   28

b[7:0] =X8   xx   X8