Cascaded Decade Counters to count 0-99

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B.C.S.E - II

Hardware Design Lab.

Cascade two Decade Counters so that it can count through 0-99.

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the decade counters are designed in the previous assignment.

Logic for cascading:

the flipflops in the counters are falling edge triggered.

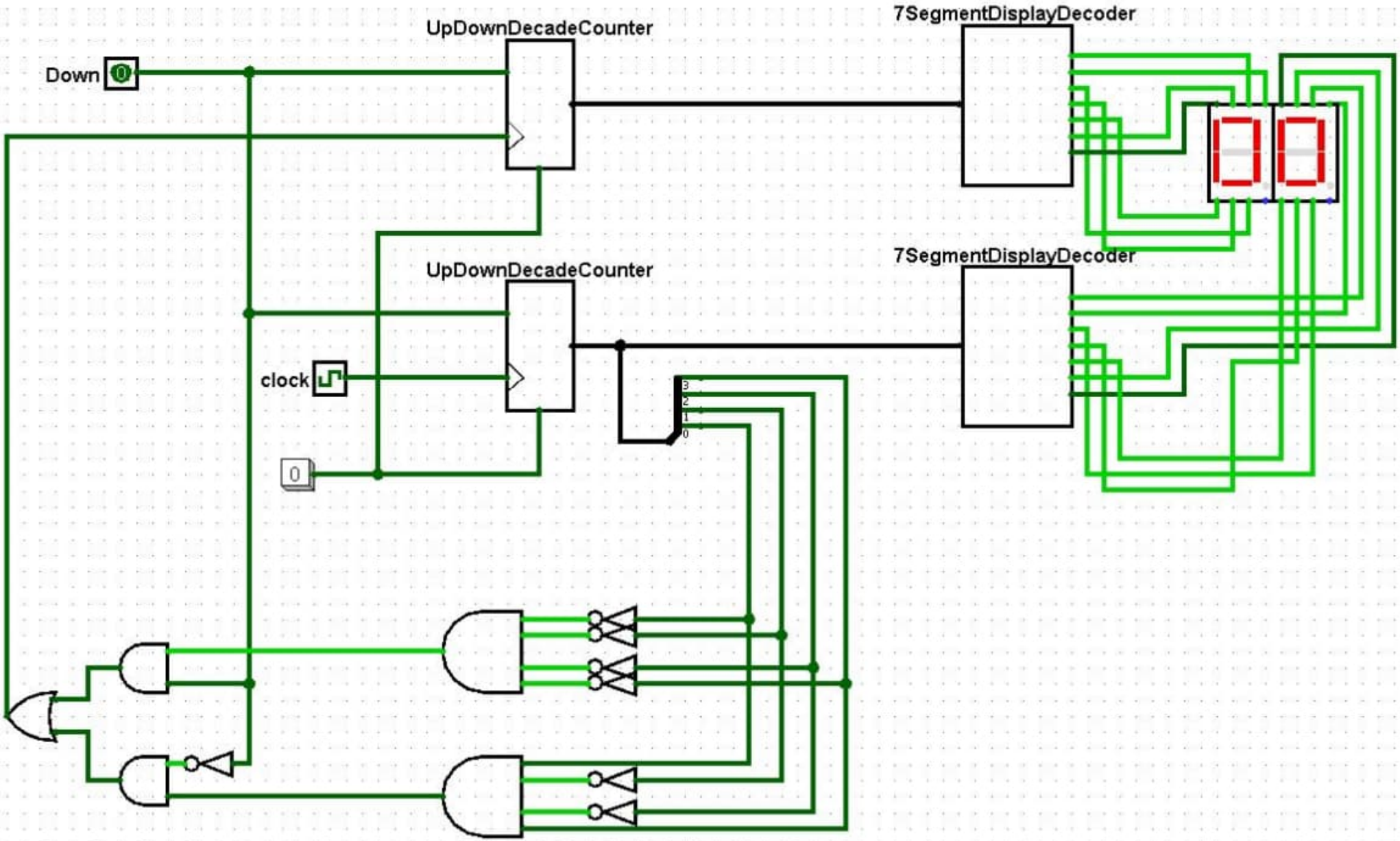
when upcounting, the clock input of the 2nd counter (10's place) should be high only when the 1st counter (1's place) gives an output of 9 (1001 in binary). So that when 1's place changes to 0, the 10's place is incremented.

when down counting, instead of 9, the clock input should be high at output 0 from the 1st counter.

let A be high when 1's place is 9 and B be high when 1's place is 0. If C is the control input, for which the counter toggles between upcounting (C=0) and down counting (C=1), then →

C \ AB	00	01	11	10
0	0	0	1	1
1	0	1	1	0

$\bar{C}A + CB$ = clock of 10's place


UpDownDecadeCounter
7SegmentDisplayDecoder
Down
UpDownDecadeCounter
7SegmentDisplayDecoder
clock
0
3
2
1
0