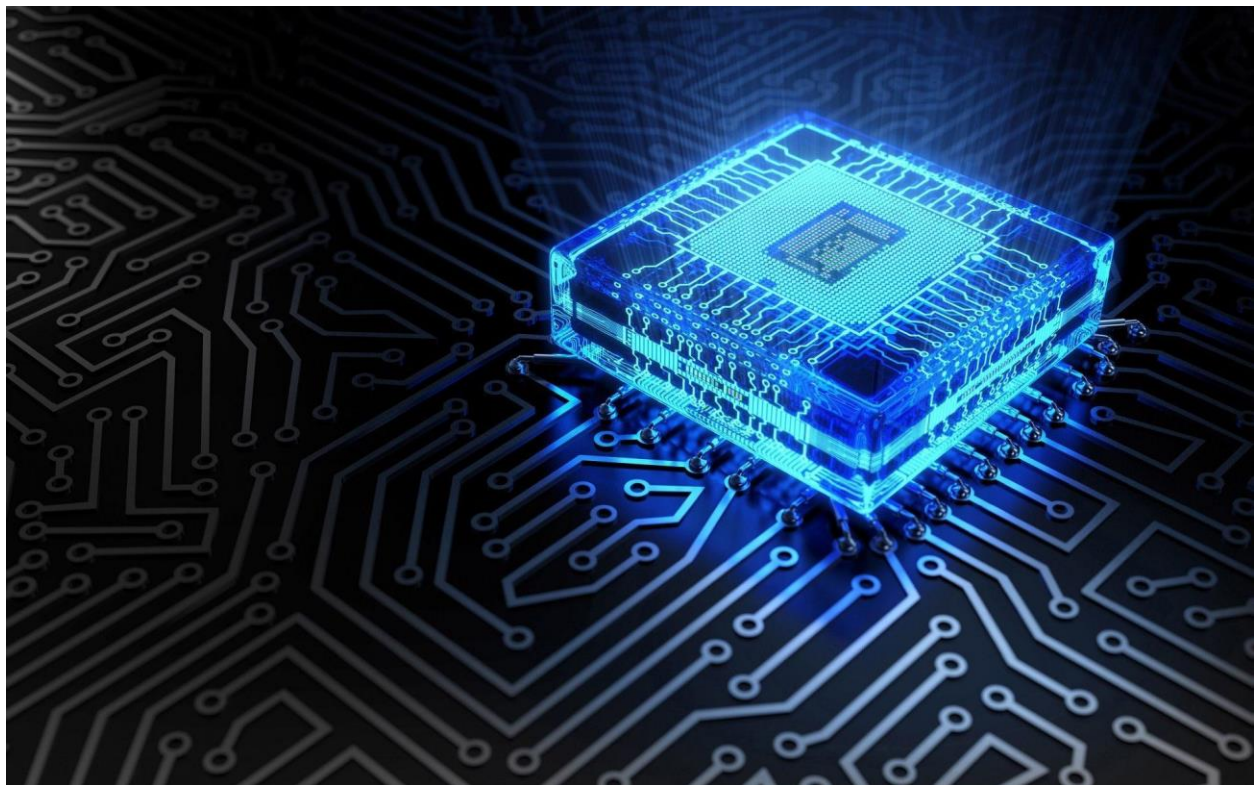


# گزارش تمرین چهارم



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گردآوری: روزبه غزوی

### Q2:

Let's take a 16 bit binary number. The output of our design will have a width of 5 bits, to include the maximum value of output, which is 16("10000").

For example,

Input = "1010\_0010\_1011\_0010" => Output = "00111" ( 7 in decimal)

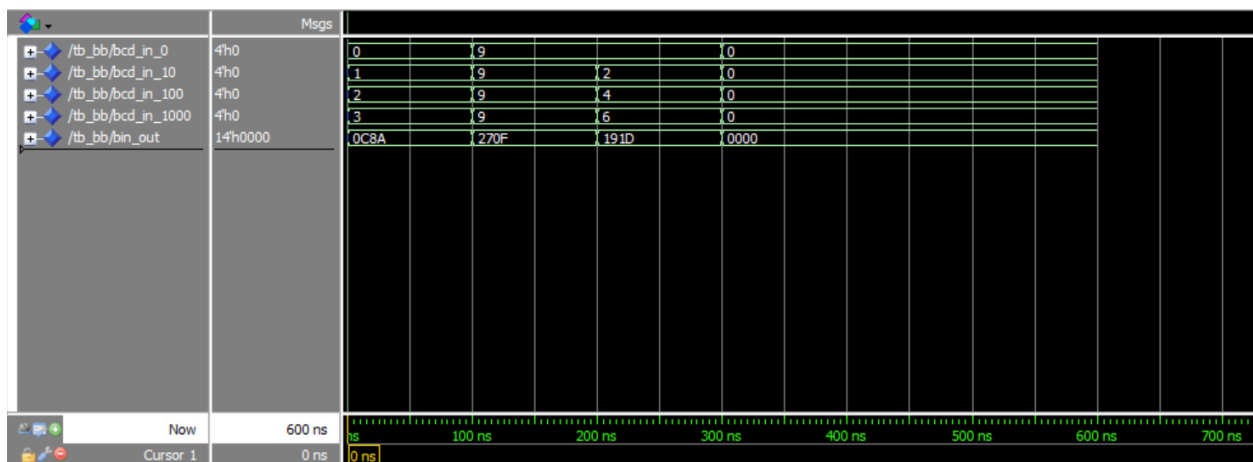
Input = "1110\_1010\_1001\_1010" => Output = "01001" ( 9 in decimal)



### Q3:

Steps

- **Step 1** -- Convert the BCD number to decimal.
- **Step 2** -- Convert decimal to binary.



Q4:

INPUT	: Three inputs (t_start) ,(t_stop) and (t_reset) are 1 bit binary .
OUTPUT :	(time_ms) := 8 bit bus. And 1Hz clock as input.

- Generated a 1ms clock from 10 ns clock by maintaining a counter.
- Used above 1 ms clock to synchronize the output of the stopwatch.
- Used four separate processes for FSM synchronizer logic, FSM combinational logic, 1ms clock logic and stopwatch logic.

**TIMING DIAGRAM:**

