COL215P: ASSIGNMENT 6

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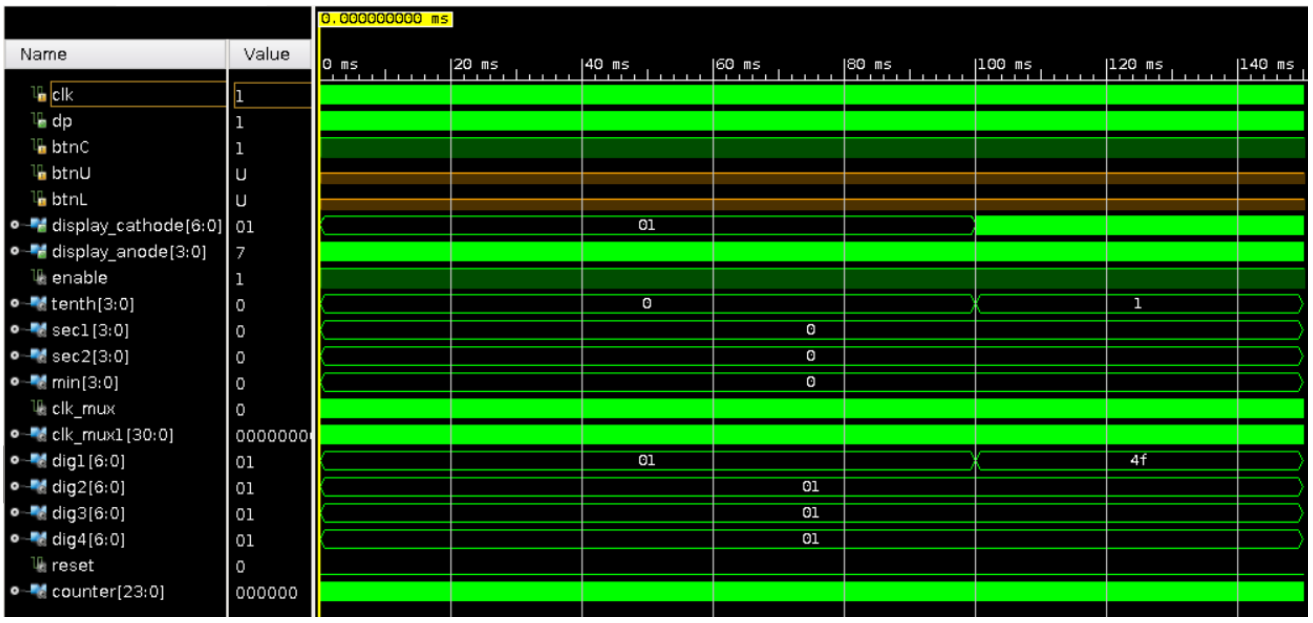
Objective:

- Using pre-designed circuit of Assignment 3 as a building block and creation of time reference.
- Design a stopwatch and implement it on BASYS 3 board, using its 7-segment display and push buttons.

Implementation Overview:

- We use the four-digit seven-segment display from Assignmen 3.
- Tenth, sec1, sec2, and min are the four variables. For one tenth of a second, tenth stores the digit. Sec1 holds the value of the second's unit digit. The value of the tenth digit of a second is stored in Sec2, and the value of minutes is stored in min.
- We use a 24 bit counter to measure time. When the counter becomes equal to 10^7 and then set the counter back to 0. Since the clock is 10^8 Hz, thus every 0.1 sec counter gets back to zero.
- The 0.1 second digit grows by one every 0.1 second. When the 0.1 second digit goes from 9 to 10, the unit digit of second increases. When the unit digit of second shifts from 9 to 0, the tens digit of second count increases. When the second count's tens digit changes from 5 to 6, the minute counting digit changes.

Simulation:

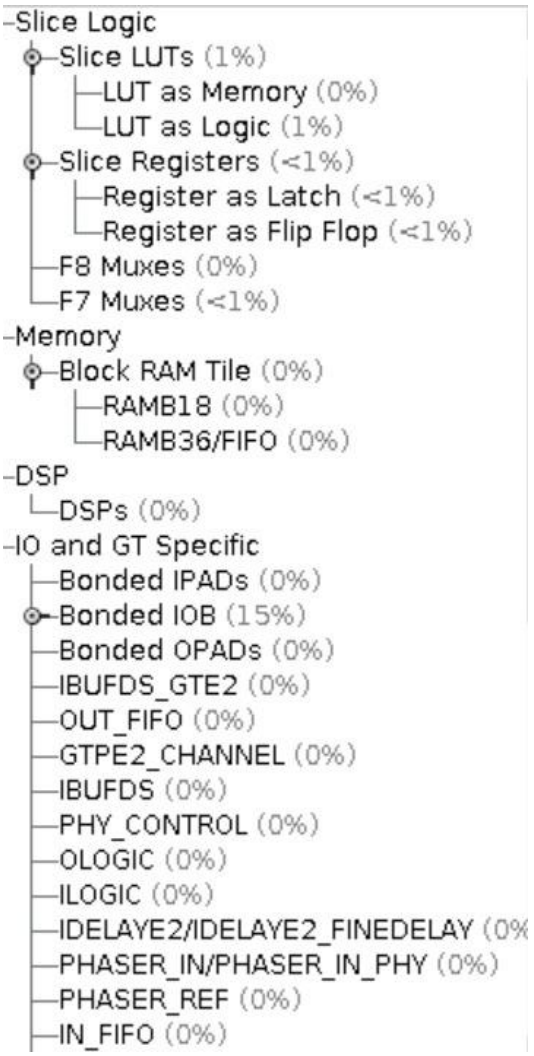


Resource utilisation:

Hierarchy

Name	Slice LUTs (20800)	Slice Registers (41600)	F7 Muxes (16300)	Bonded IOB (106)	BUFGCTRL (32)
main	91	60	7	16	2
create_mux_clock (ti...	35	17	7	0	0

Resource	Utilisation No.	Utilisation %
Slice LUTS	91	1
Slice Registers	60	< 1
F7 Muxes	7	< 1
BUFGCTRL	16	
Bonded IOBs	2	
DSP	0	



FPGA Observation: