Assignment 1

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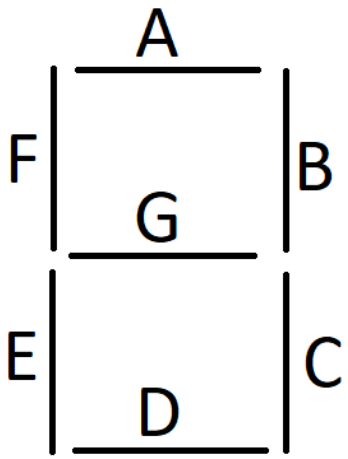
Steps to make Seven Segment Display in Vivado are following:

1. Create a Vhdl file in “design Sources” and write vhdl code of Seven Segment Display.
2. In Vhdl code the inputs will be B0,B1,B2,B3 and Outputs will be A,B,C,D,E,F,G.
   B0 → Switch one
   B1 → Switch two
   B2 → Switch three
   B3 → Switch four

LED With and Outputs



If Output is 0 then that part of Led will glow.
For input B0,B1,B2,B3 the output is (B0’+B1’*2+B2’*4+B3’*8).
(number greater than 9 will be in alphabet)

Truth Table For Seven Segment Display:

B3	B2	B1	B0	A	B	C	D	E	F	G
0	0	0	0	0	0	0	0	0	0	1
0	0	0	1	1	0	0	1	1	1	1
0	0	1	0	0	0	1	0	0	1	0
0	0	1	1	0	0	0	0	1	1	0
0	1	0	0	1	0	0	1	1	0	0
0	1	0	1	0	1	0	0	1	0	0
0	1	1	0	0	1	0	0	0	0	0
0	1	1	1	0	0	0	1	1	1	1
1	0	0	0	0	0	0	0	0	0	0
1	0	0	1	0	0	0	1	1	0	0
1	0	1	0	0	0	0	1	0	0	0
1	0	1	1	1	1	0	0	0	0	0
1	1	0	0	0	1	1	0	0	0	1
1	1	0	1	1	0	0	0	0	1	0
1	1	1	0	0	1	1	0	0	0	0
1	1	1	1	0	1	1	1	0	0	0

Boolean Logic From Truth Table

A = (B2’B0’+B3’B1+B2B1+B3B0’+B3’B2B0+B3B2’B1’)’
B = (B3’B2’+B2’B0’+B3’B1’B0’+B3’B1B0+B3B1’B0)’
C = (B3’B1’+B3’B0+B1’B0+B3’B2+B3B2’)’
D = (B3’B2’B0’+B2’B1B0+B2B1’B0+B2B1B0’+B3B1’B0’)’
E = (B2’B0’+B1B0’+B3B1+B3B2)’
F = (B1’B0’+B2B0’+B3B2’+B3B1+B3’B2B1’)’
G = (B2’B1+B1B0’+B3B2’+B3B0+B3’B2B1’)’

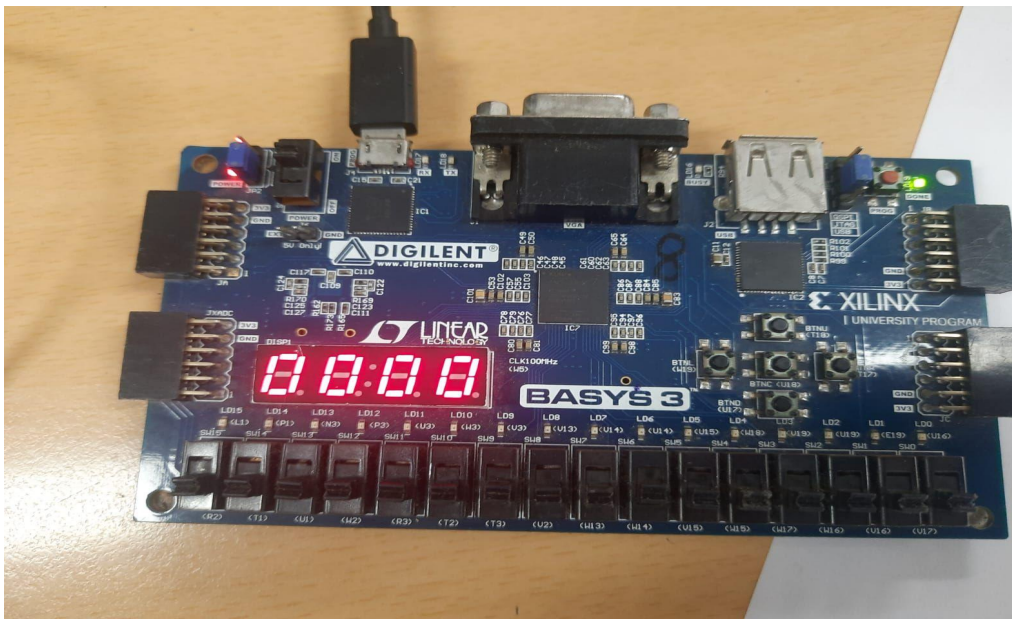
3. Create a Xdc file in “Constraints” and write Constraint of Seven Segment Display.
4. Create a Vhdl file in “Utility Sources” and write testbatch of of Seven Segment Display.
5. Run Simulation

Screenshots of our Simulations

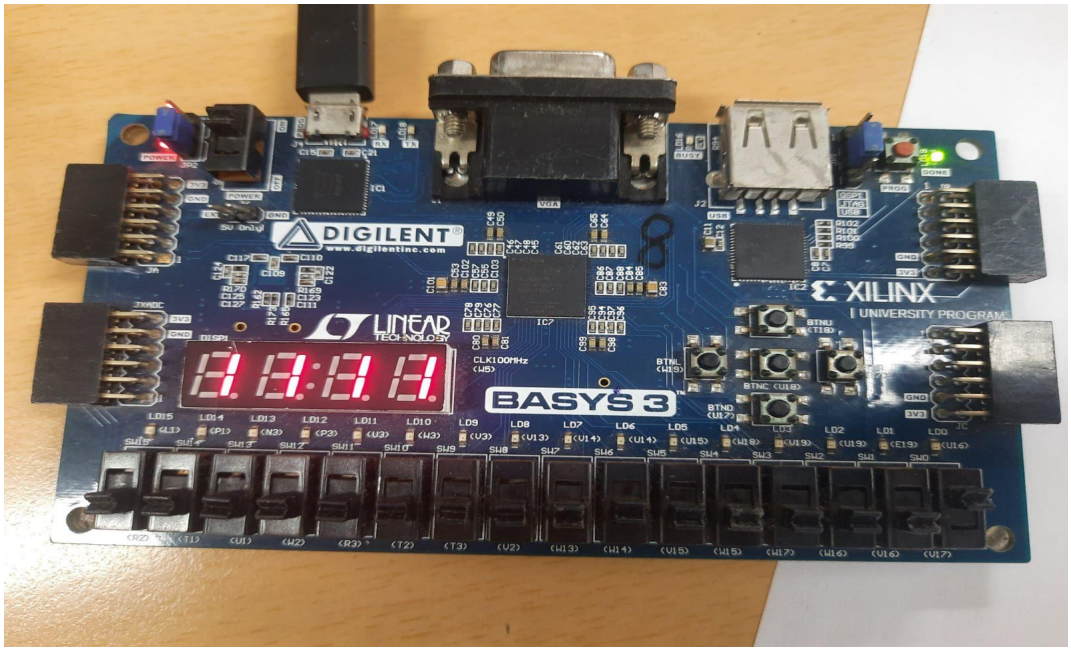
6. Run Synthesis
7. To get bit file press on genterate generate bitstream.
8. Press on Hardware Manager and click program Device and check in fpga that Seven Segment Display is working fine.

Photo of FPGAS

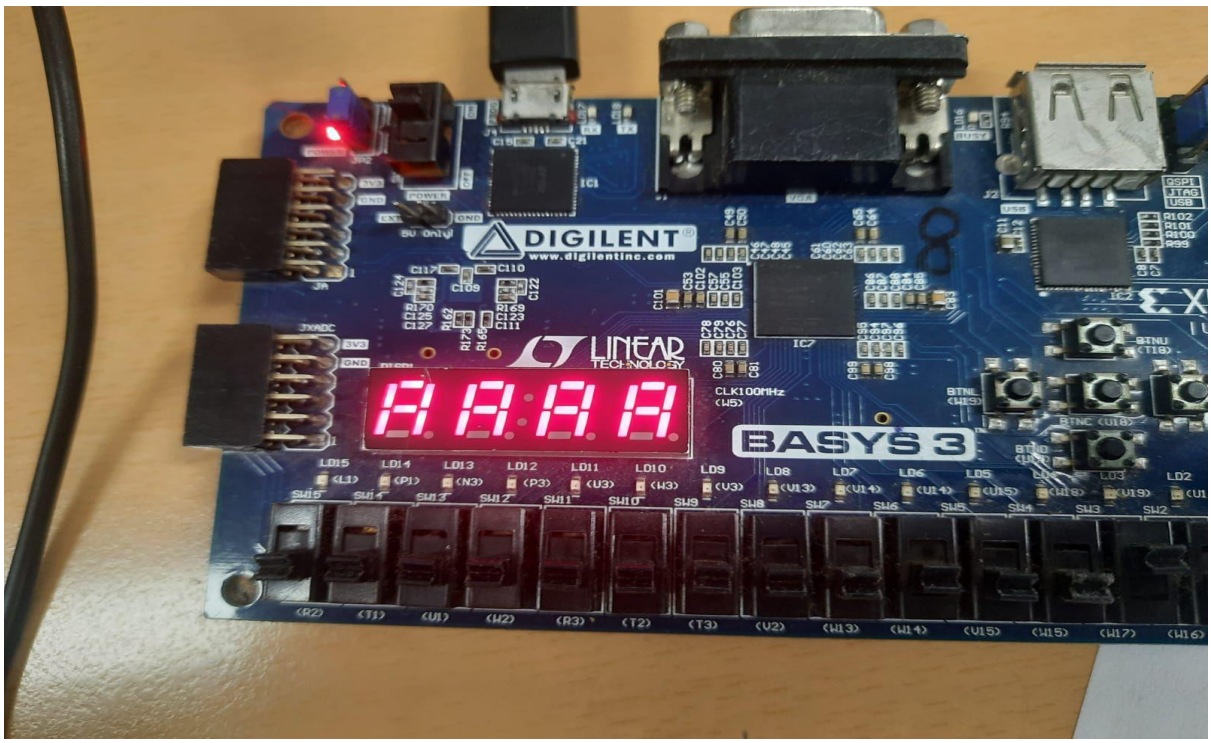
For Input = 0



For Input = 1



For Input = 10



For Input = 15