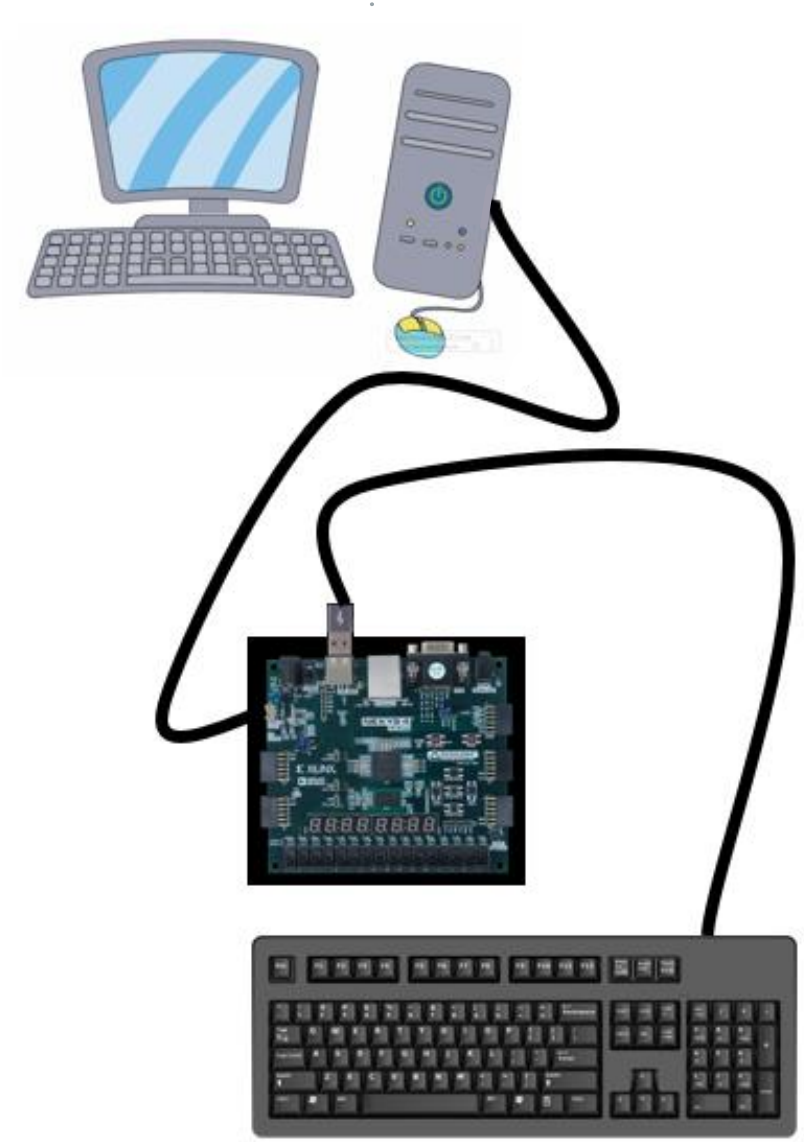
BCD TO BINARY/HEX CONVERTER

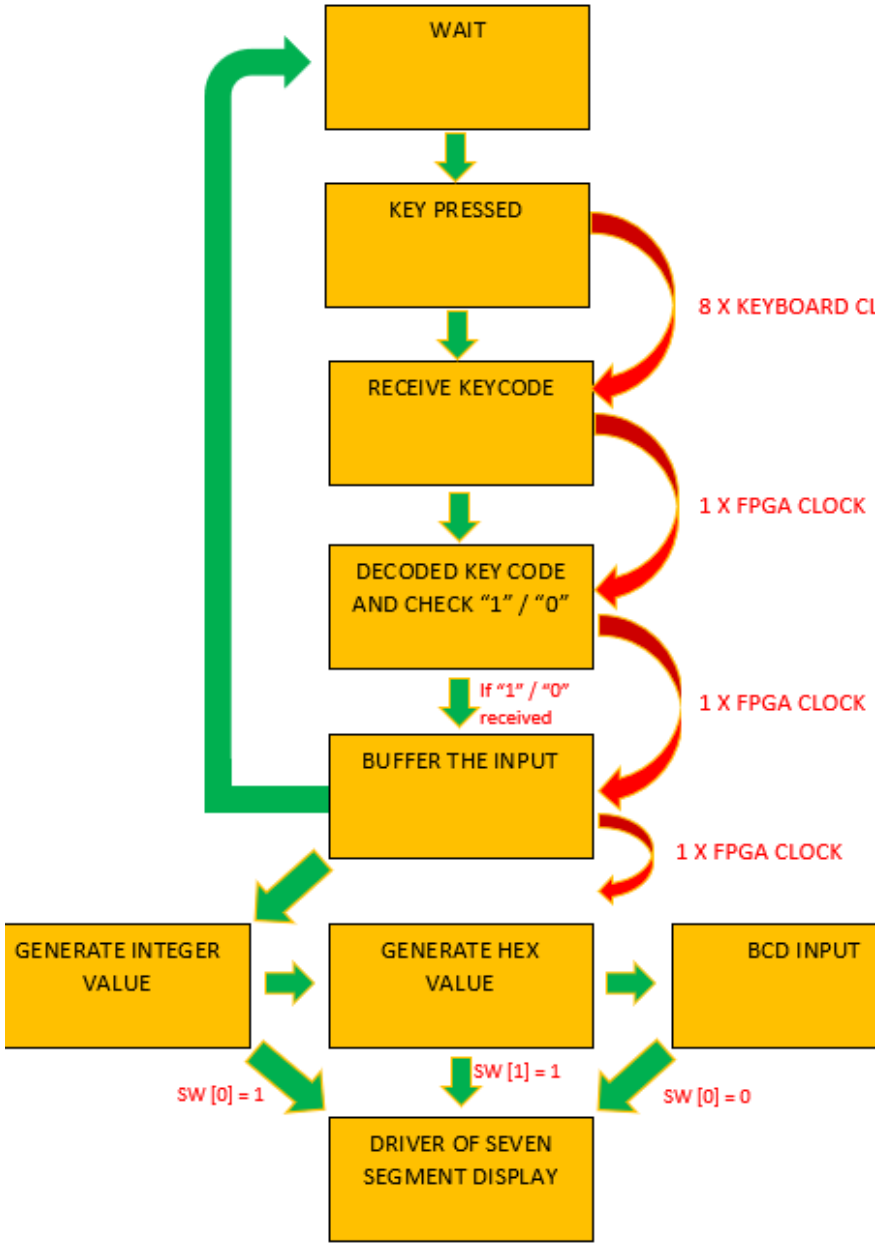
BY: RAMI SULAIMAN
ANDROW ATTYA
RACHELLE GALAN
JOSH BIRIIAC

OVERVIEW

- Keyboard is connected to a FPGA board via USB port, and entering a BCD number using the keyboard.
- Using VHDL code to convert the input BCD code to Binary and Hex
- A Seven Segment Display is used to display the BCD number inputted, result of Binary, and Hex
- Switch 0 is used to display Binary, Switch 1 is used to display Hex, and Switch 2 to rest.

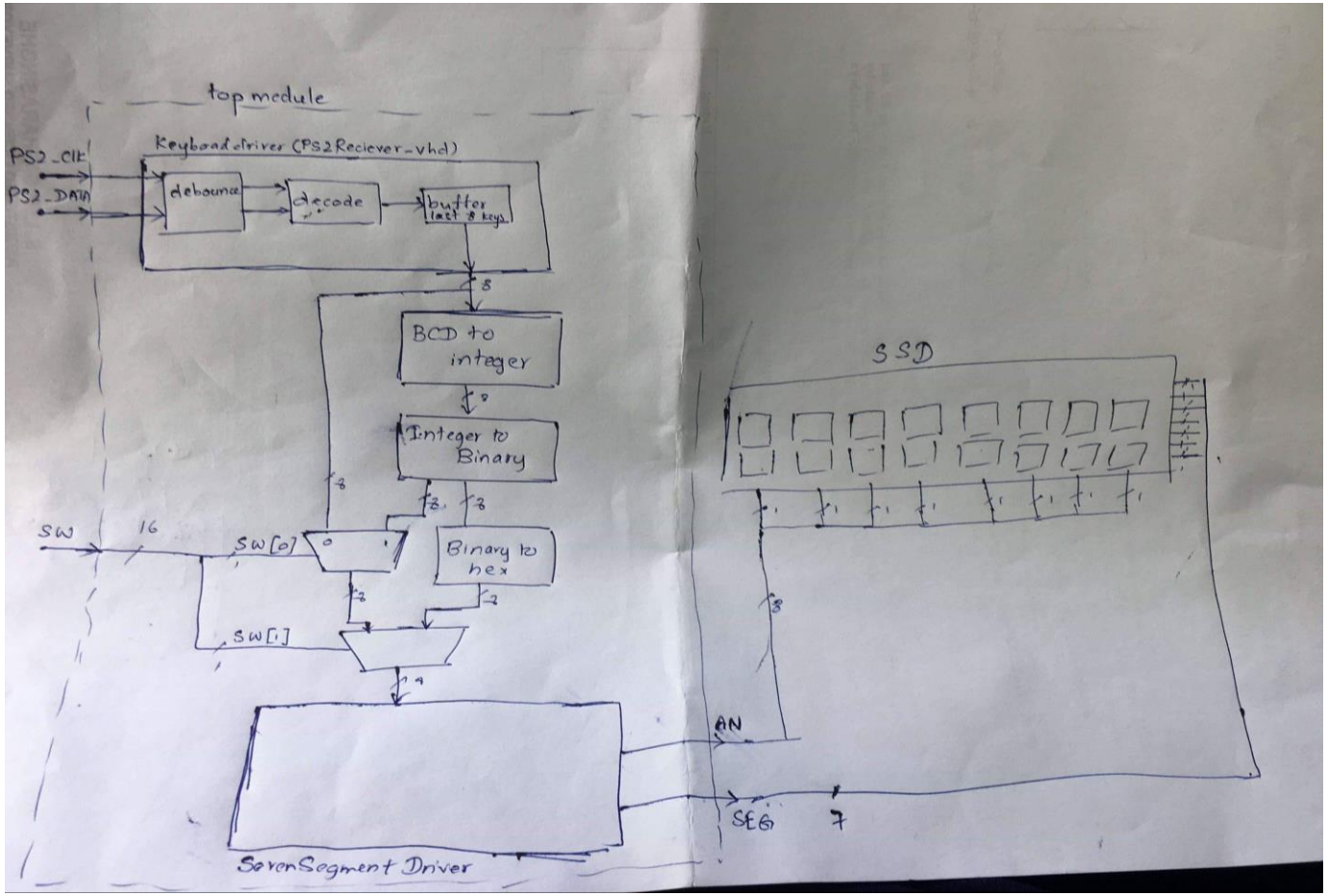


TOP LEVEL BLOCK DIAGRAM

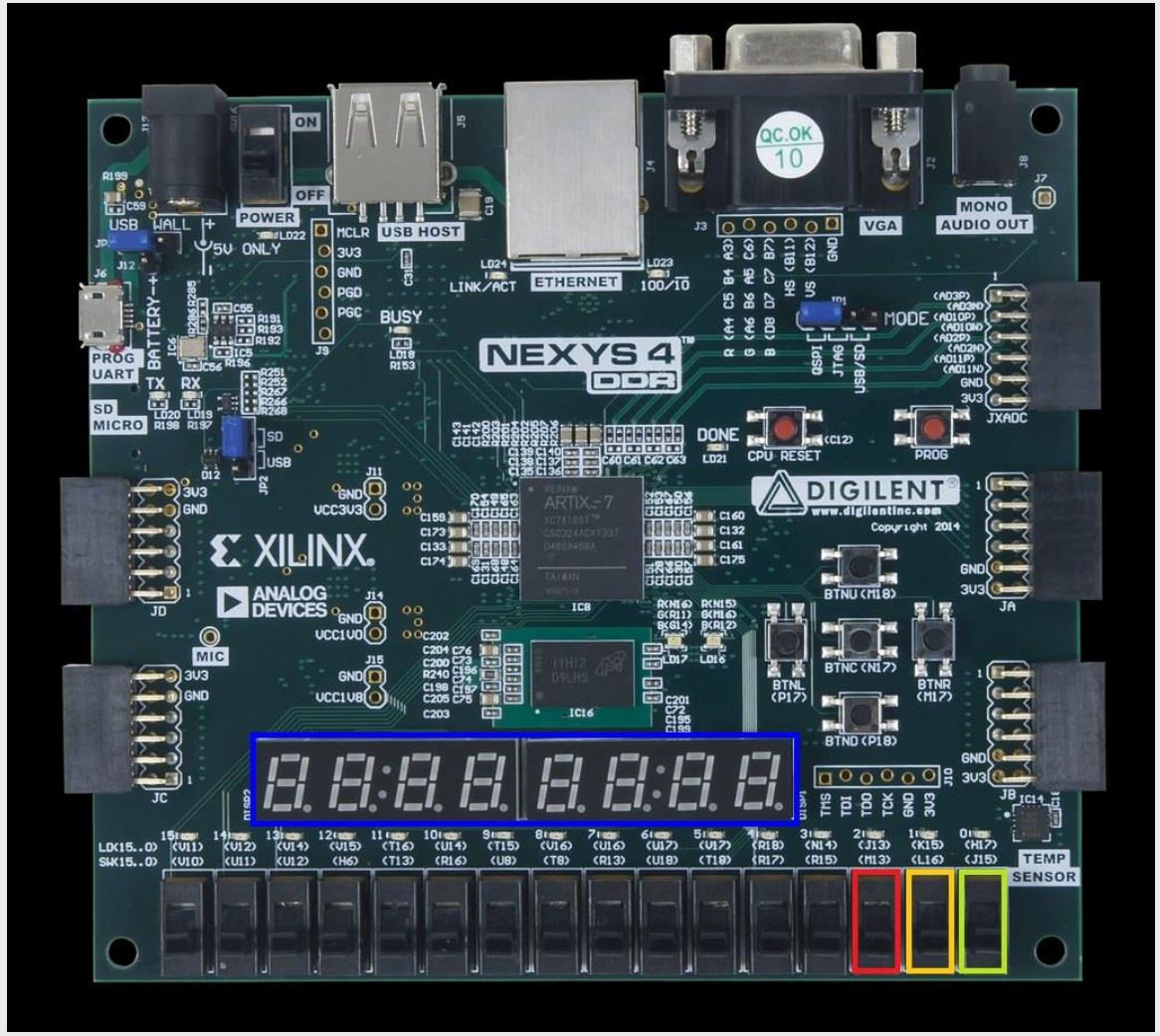


PROCESS BLOCK DIAGRAM

DATA PATH SCHEMATICS



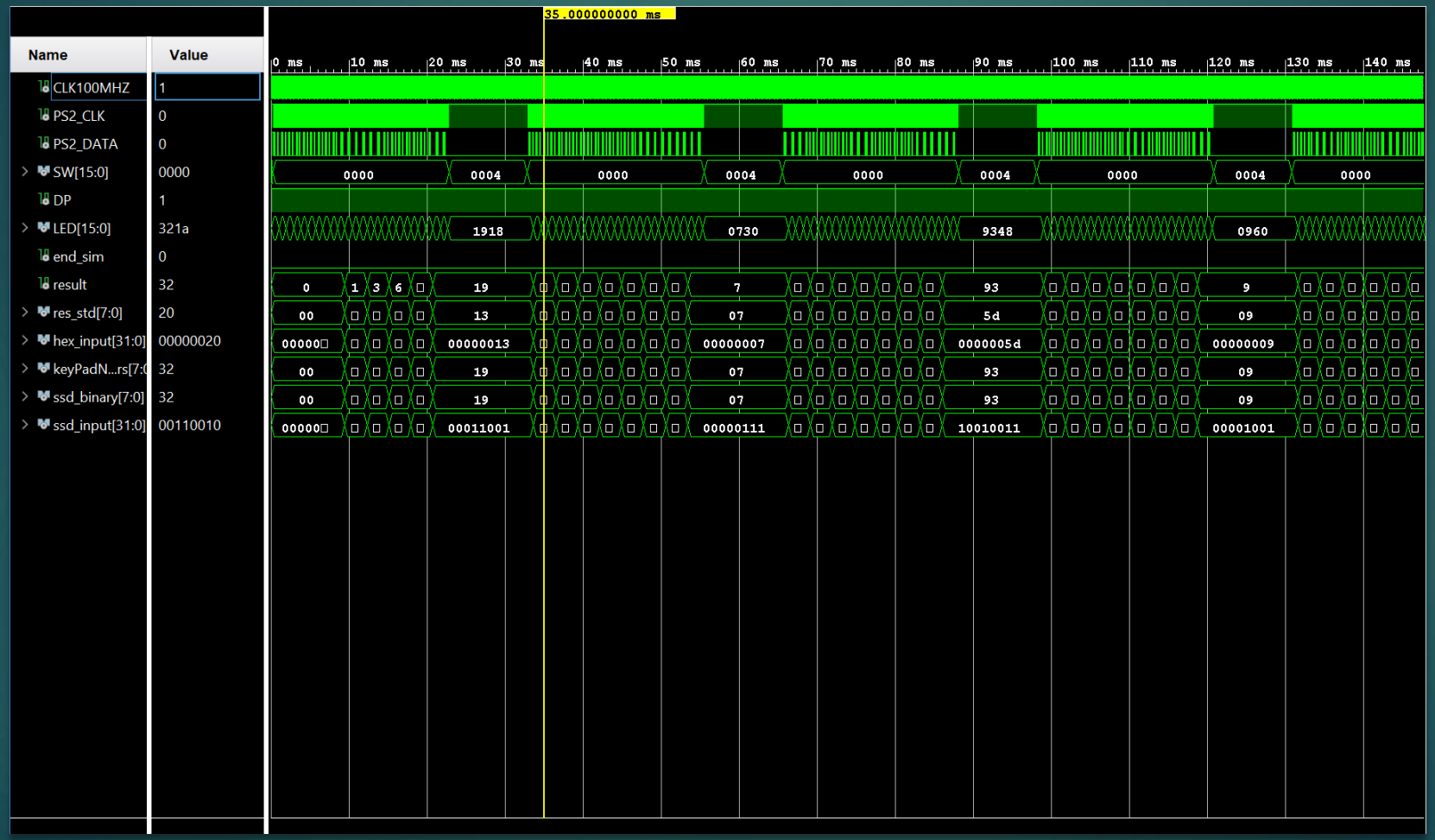
- BINARY
- HEX
- RESET
- SEVEN SEGMENT DISPLAY



EXPERIMENTAL SETUP

TRIAL #	DECIMAL #	INPUT (BCD)	OUTPUT (BINARY)	OUTPUT (HEX)
1	19	0001-1001	00010011	13
2	7	0000-0111	00000111	7
3	93	1001-0011	01011101	5D
4	9	0000-1001	00001001	9
5	48	0100-1000	00110000	30

SIMULATION


35.000000000 ms
Name
Value
0 ms
10 ms
20 ms
30 ms
40 ms
50 ms
60 ms
70 ms
80 ms
90 ms
100 ms
110 ms
120 ms
130 ms
140 ms
CLK100MHZ
1
PS2_CLK
0
PS2_DATA
0
SW[15:0]
0000
0000 0004 0000 0004 0000 0004 0000 0004 0000
DP
1
LED[15:0]
321a
1918 0730 9348 0960
end_sim
0
result
32
0 1 3 6 19 7 93 9
res_std[7:0]
20
00 13 07 5d 09
hex_input[31:0]
00000020
00000013 00000007 0000005d 00000009
keyPadN...rs[7:0]
32
00 19 07 93 09
ssd_binary[7:0]
32
00 19 07 93 09
ssd_input[31:0]
00110010
00011001 00000111 10010011 00001001

CONCLUSION

- The process of converting BCD to binary and hex was successfully implemented on an FPGA along with connecting a Keyboard via USB
- Connecting a keyboard to a Nexys Board was more difficult then expected especially as the user enters the BCD number, the numbers must shift to the left every time the user enters a new number “0 or 1”.

ANY QUESTIONS