Description

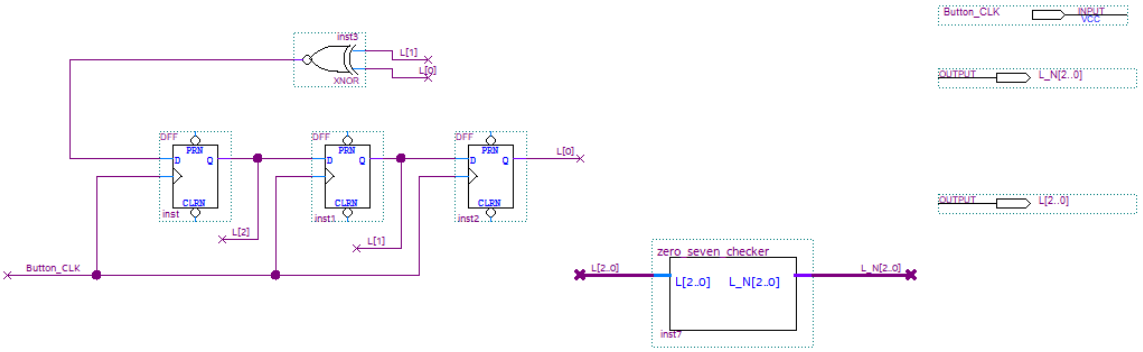
This Dice uses a binary display system (red LEDs) and a linear feedback regression system to simulate randomness. This is done through the use of 3 D flip flops and an XNOR. Additionally, the circuit uses a binary decoder created through NANDs, NORs and NOT gates to filter out unwanted output values (0, 7) which would not normally be seen on a regular 6-sided die.

NOTE - This system was originally intended to have a seven-segment display and decoder to display decimal values rather than binary.

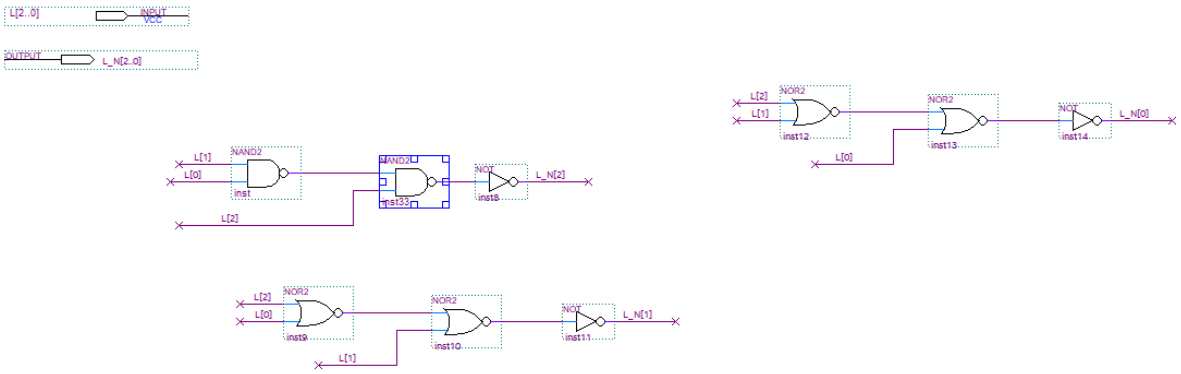
Necessary Components:

Name	Quantity	Function
IC 7486	**1**	Quad 2-input XOR gate used for 3-bit LFSR
IC 74175	**1**	4-channel D FlipFlop
IC 7402	**1**	4-channel NOR Gates
IC 7400	**1**	4-channel NAND Gates
IC 7404	**1**	8-channel NOT Gates
7-segment Display	**1**	7-segment display
IC 7447	**1**	7-segment display decoder

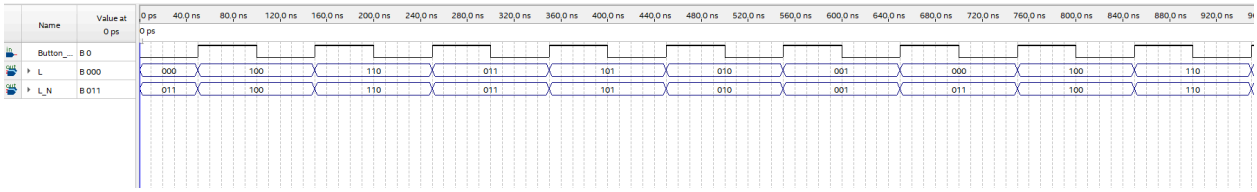
Main Mapping



0/7 Checker


L[2..0]
INPUT
VCC
OUTPUT
L_N[2..0]
L[1]
L[0]
NAND2
inst1
NAND2
inst33
NOT
inst8
L_N[2]
L[2]
L[2]
NOR2
inst12
NOR2
inst13
NOT
inst14
L_N[0]
L[0]
L[2]
L[0]
NOR2
inst9
NOR2
inst10
NOT
inst11
L_N[1]
L[1]

Quartus Simulation



Voltage Divider