$$y[0] = b[0] \cdot x[0]$$

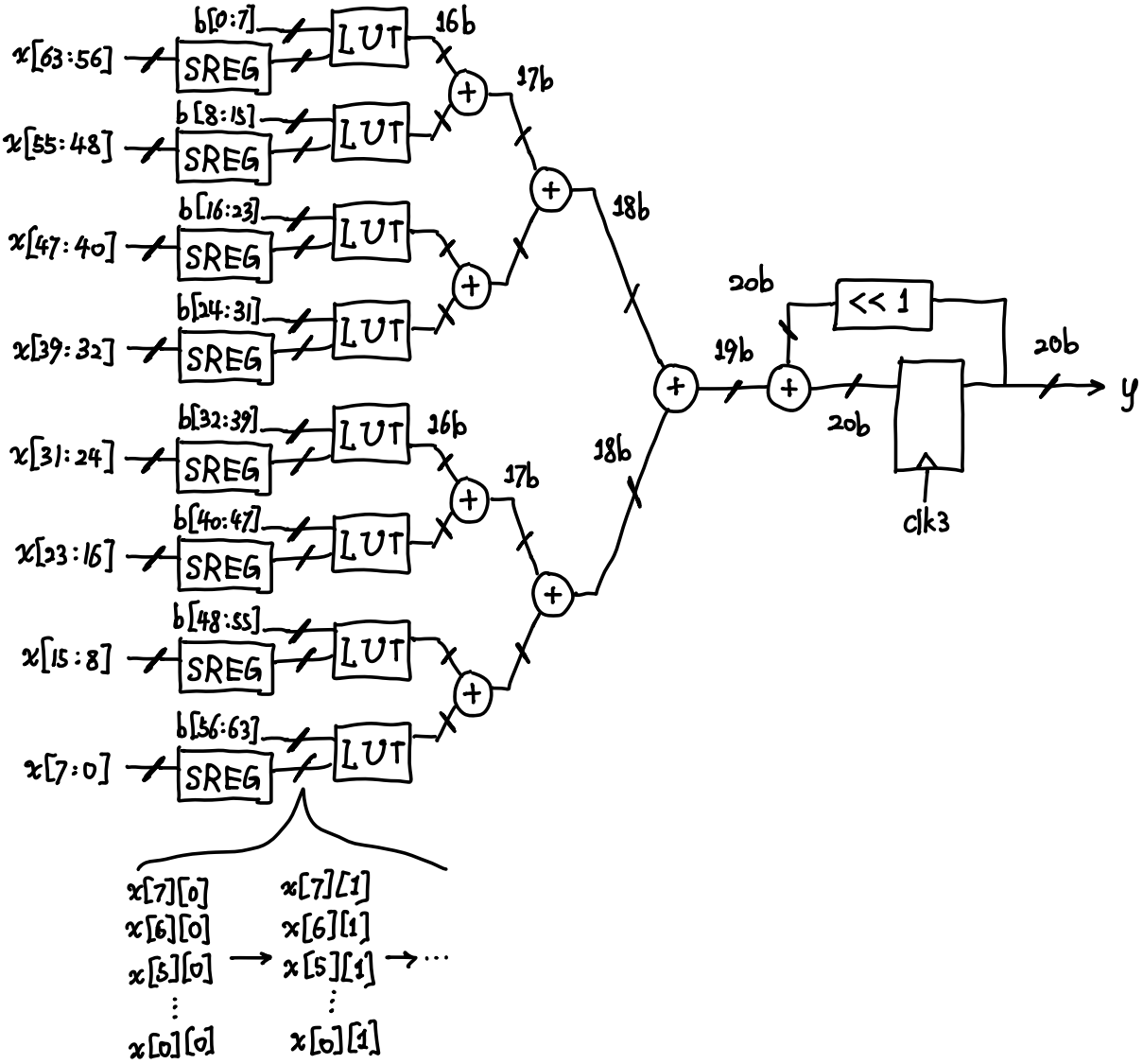
$$y[1] = b[0] \cdot x[1] + b[1] \cdot x[0]$$

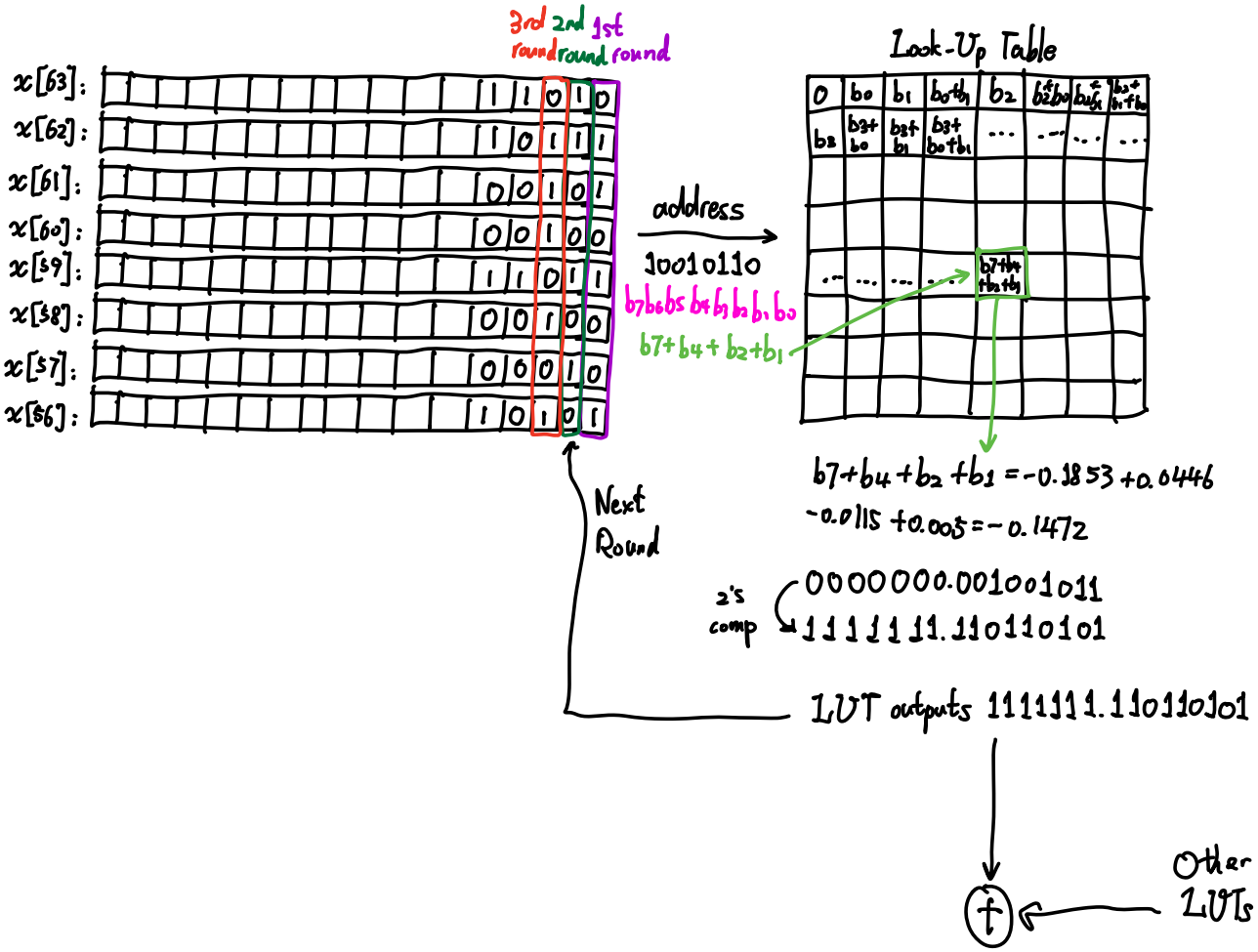
$$y[2] = b[0] \cdot x[2] + b[1] \cdot x[1] + b[2] \cdot x[0]$$

$$\vdots$$

$$y[63] = b[0] \cdot x[63] + b[1] \cdot x[62] + b[2] \cdot x[61] + \cdots + b[62] \cdot x[1] + b[63] \cdot x[0]$$

2^{64} is horrendously large, need multiple LUTs. A good balance is to partition 64 inputs into 8 adder trees of 8 inputs.




3rd round
2nd round
1st round
x[63]:
x[62]:
x[61]:
x[60]:
x[59]:
x[58]:
x[57]:
x[56]:
address
10010110
b7 b6 b5 b4 b3 b2 b1 b0
b7+b4+b2+b1
Look-Up Table
Next Round
b7+b4+b2+b1 = -0.3853 + 0.0446
-0.0115 + 0.005 = -0.1472
2's comp
00000000.001001011
11111111.110110101
LUT outputs 11111111.110110101
Other LUTs