

MATRIX MULTIPLICATION

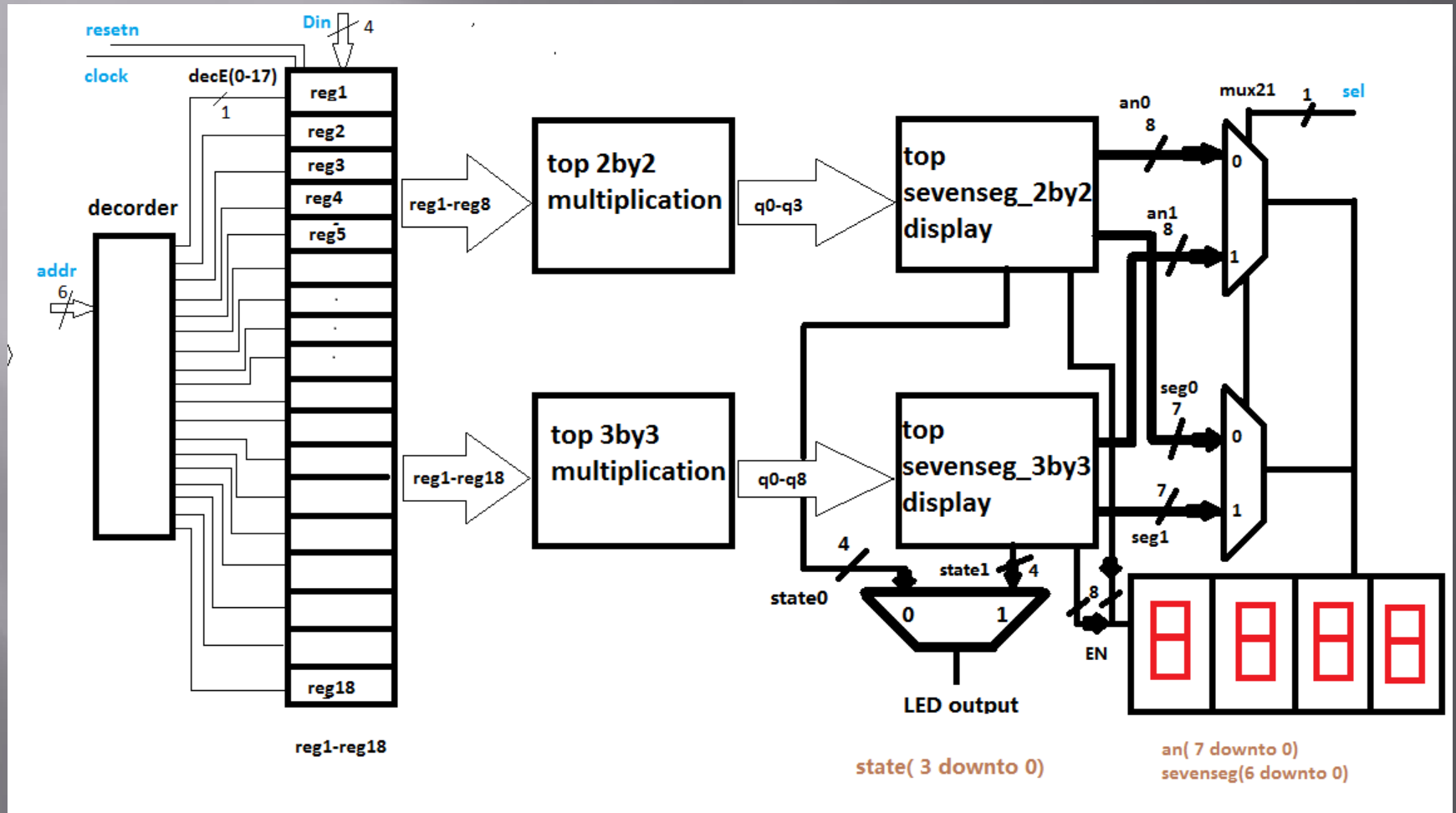
Raymond Benjamin

Swain Dakho

Tiantian Ma

Dominic Garmo

Matrix Multiplication Top

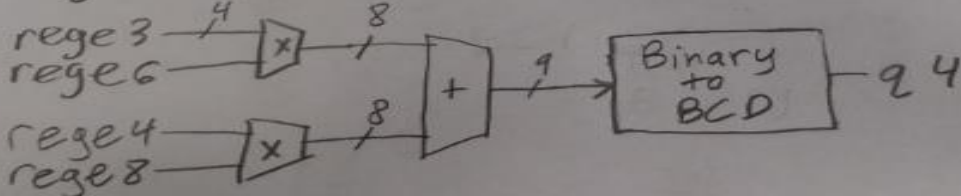
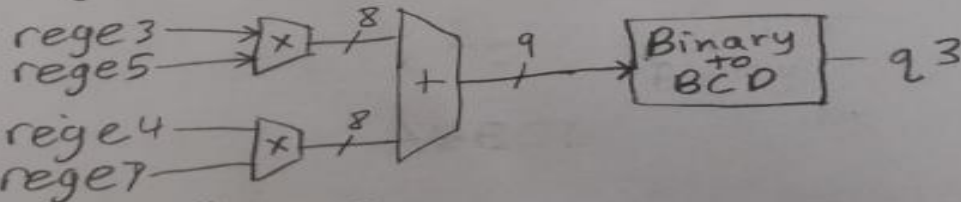
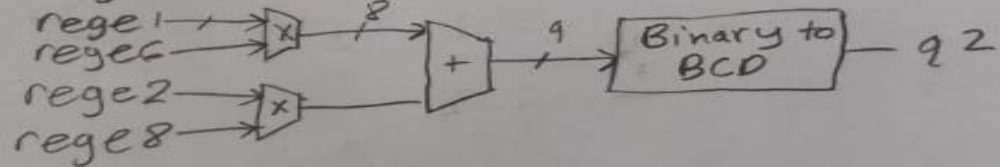
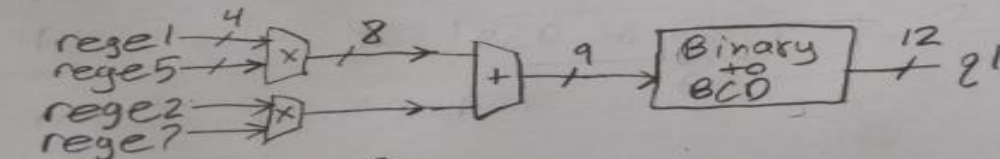


Top 2 x 2 Multiplication

top 2x2 Multiplication

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \times \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix} = \begin{bmatrix} 1 \cdot 5 + 2 \cdot 7 & 1 \cdot 6 + 2 \cdot 8 \\ 3 \cdot 5 + 4 \cdot 7 & 3 \cdot 6 + 4 \cdot 8 \end{bmatrix} = \begin{bmatrix} q1 & q2 \\ q3 & q4 \end{bmatrix}$$

register position



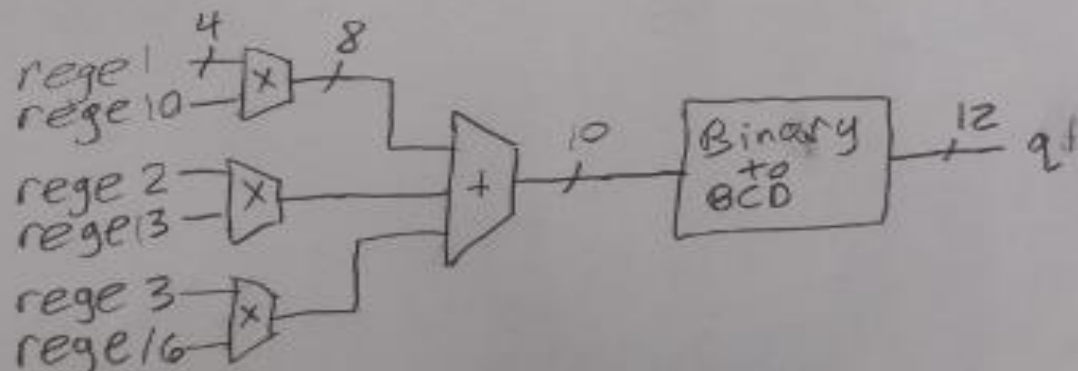
Top 3 x 3 Multiplication

top 3 by 3 Multiplication

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix} \times \begin{bmatrix} 10 & 11 & 12 \\ 13 & 14 & 15 \\ 16 & 17 & 18 \end{bmatrix} = \begin{bmatrix} q1 & q2 & q3 \\ q4 & q5 & q6 \\ q7 & q8 & q9 \end{bmatrix}$$

↑
register position

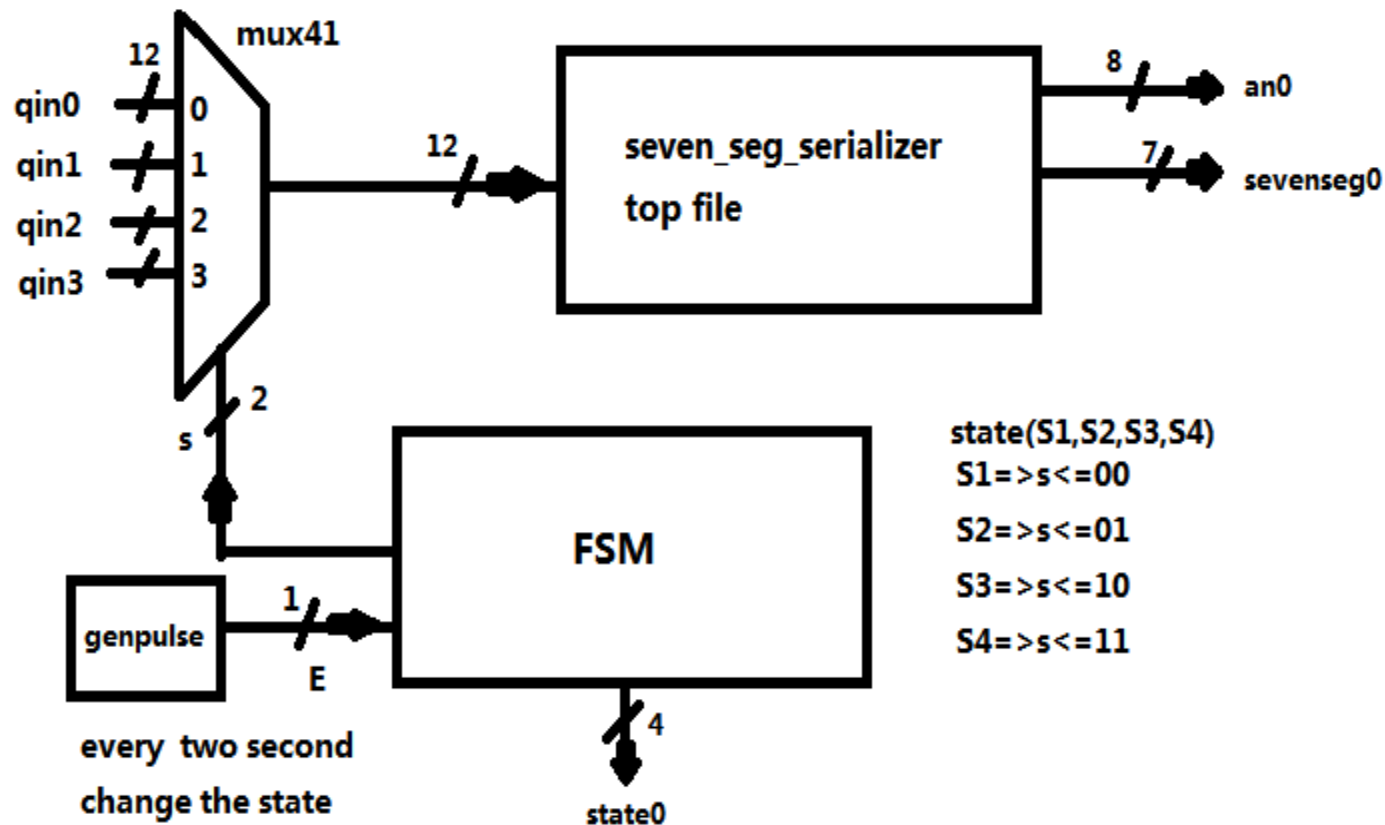
$$\begin{bmatrix} 1 \cdot 10 + 2 \cdot 13 + 3 \cdot 16 & 1 \cdot 11 + 2 \cdot 14 + 3 \cdot 17 & 1 \cdot 12 + 2 \cdot 15 + 3 \cdot 18 \\ 4 \cdot 10 + 5 \cdot 13 + 6 \cdot 16 & 4 \cdot 11 + 5 \cdot 14 + 6 \cdot 17 & 4 \cdot 12 + 5 \cdot 15 + 6 \cdot 18 \\ 7 \cdot 10 + 8 \cdot 13 + 9 \cdot 16 & 7 \cdot 11 + 8 \cdot 14 + 9 \cdot 17 & 7 \cdot 12 + 8 \cdot 15 + 9 \cdot 18 \end{bmatrix}$$



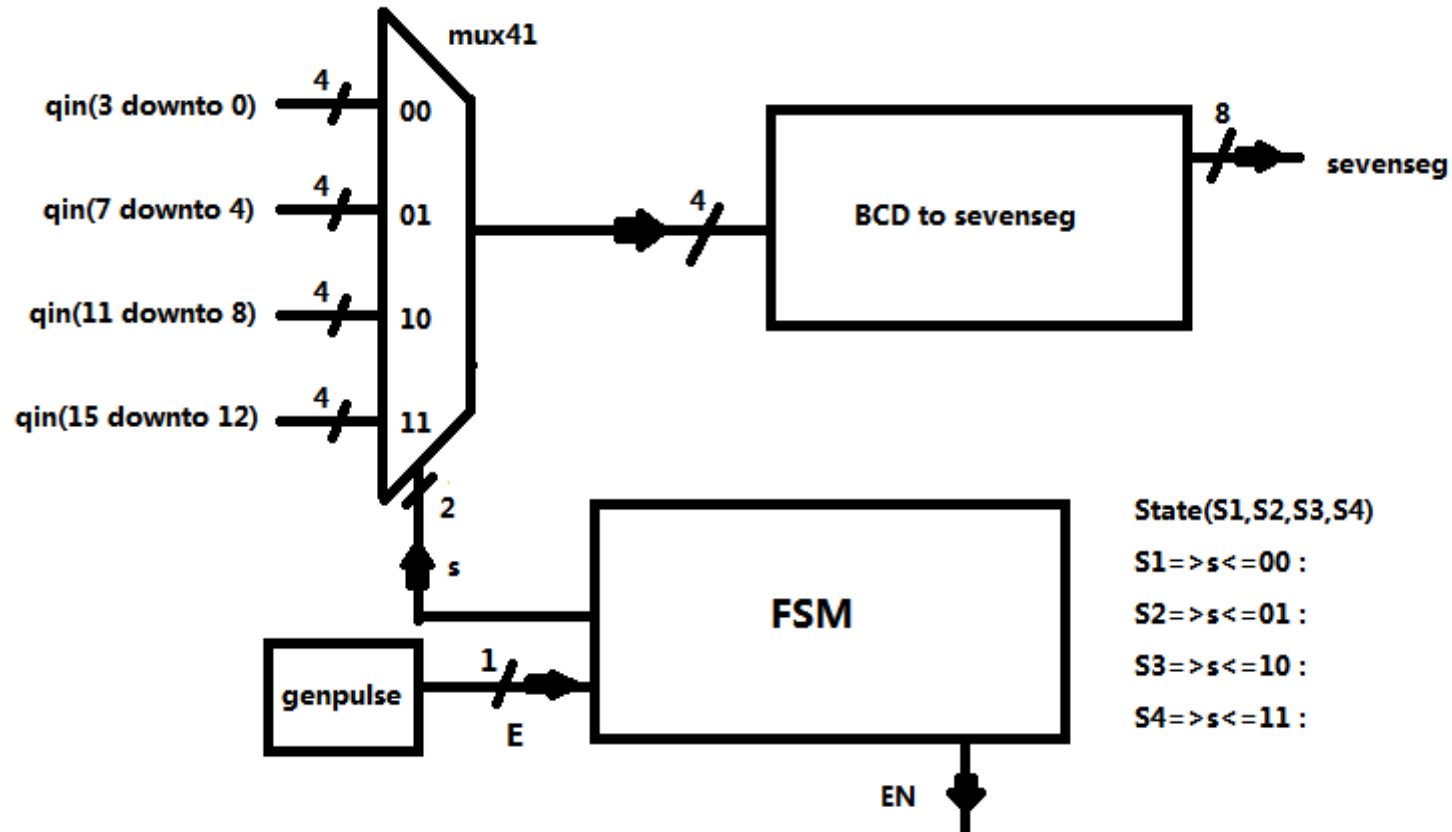
Top SevenSeg 2 x 2

qin0-qin3 is 4bit

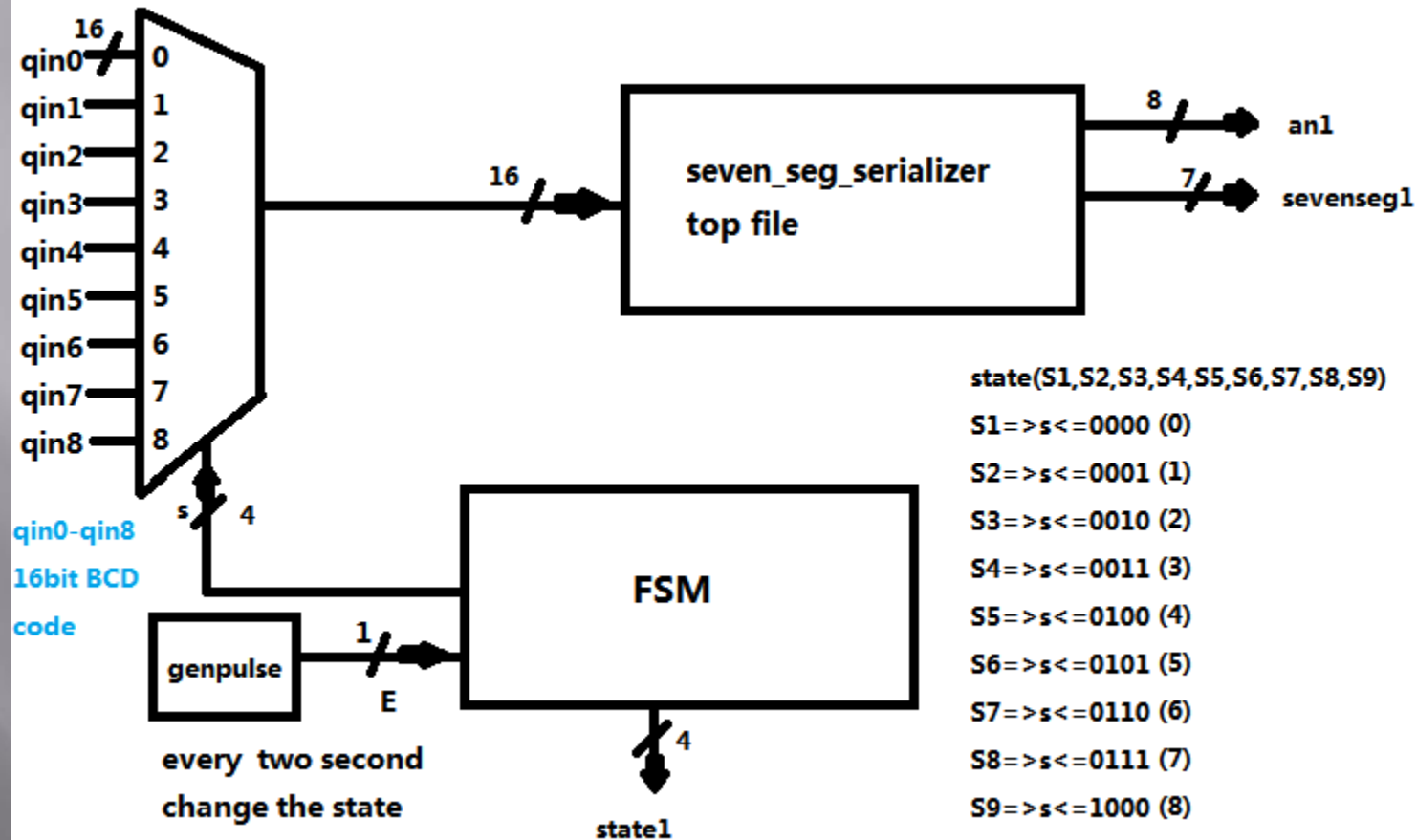
BCD code



Seven Seg Serializer



Top Seven Seg 3 x 3



Seven Seg Serializer

