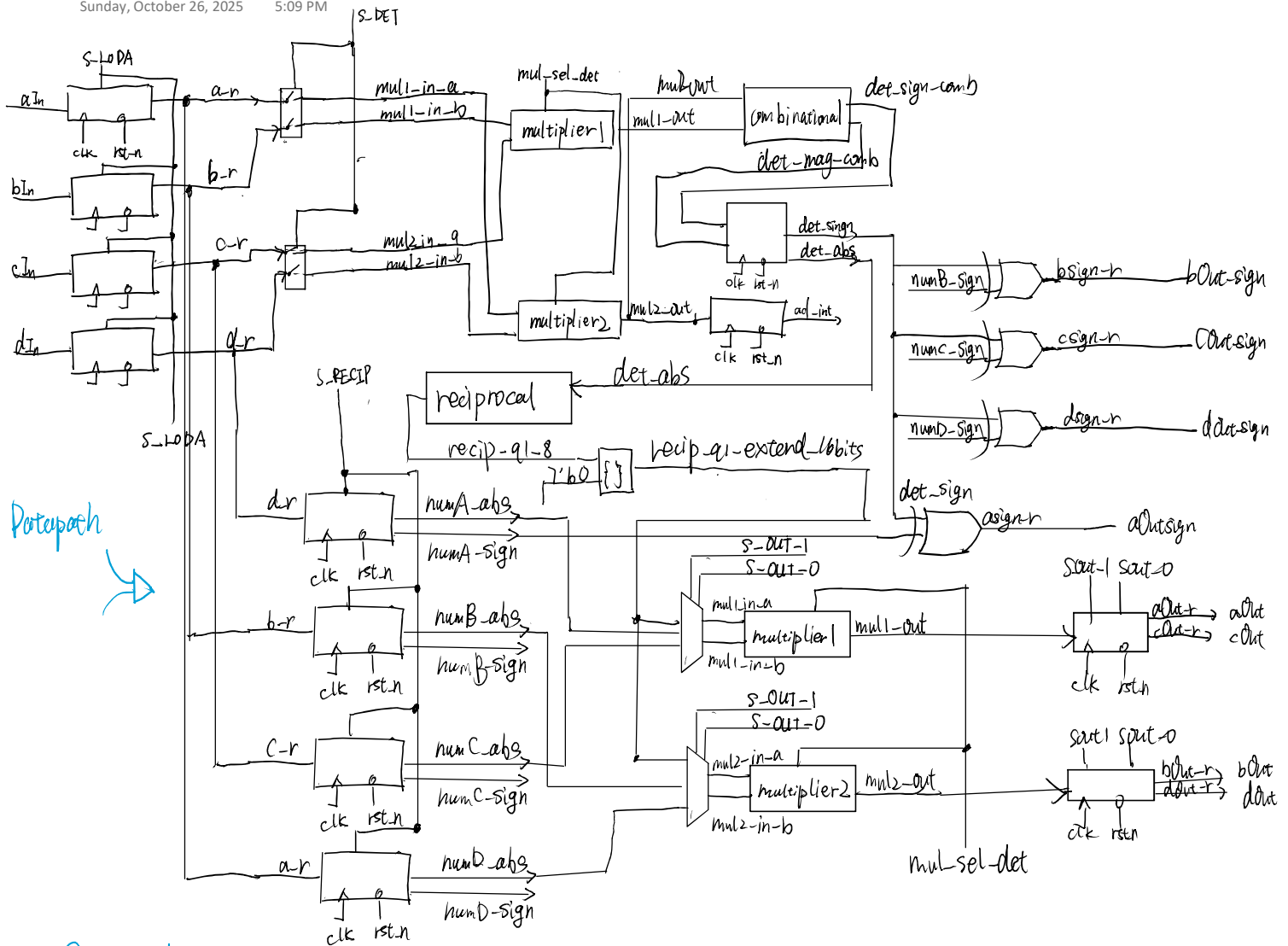
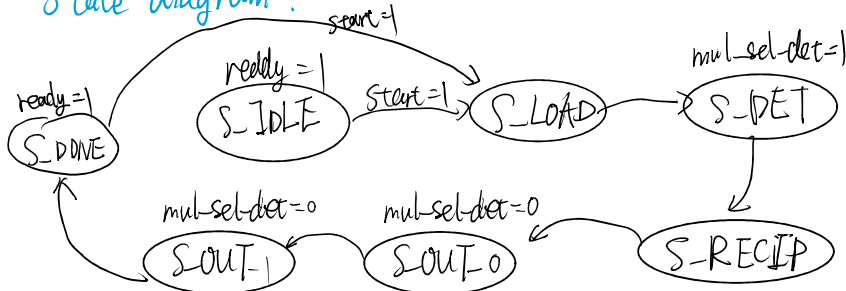


# H4q1

Sunday, October 26, 2025 5:09 PM



State diagram:



Test bench:

test 1:

$$\begin{bmatrix} 1 & 1 \\ 1 & 2 \end{bmatrix} \quad \text{expected} \quad \begin{bmatrix} 1 & 1 \\ 1 & 2 \end{bmatrix}^{-1} = \begin{bmatrix} 2 & -1 \\ -1 & 1 \end{bmatrix} \quad \begin{array}{c|c|c} & \text{Out} & \text{sign} \\ \hline a & 2 & 0 \\ b & -1 & 1 \\ c & -1 & 1 \\ d & 1 & 0 \end{array}$$

test 2:

$$\begin{bmatrix} 2 & 0 \\ 0 & 3 \end{bmatrix}^{-1} = \frac{1}{6-0} \begin{bmatrix} 3 & 0 \\ 0 & 2 \end{bmatrix} = \begin{bmatrix} 0.5 & 0 \\ 0 & 0.33 \end{bmatrix} \quad \begin{array}{c|c|c} & \text{Out} & \text{sign} \\ \hline a & 0.5 & 0 \\ b & 0 & 0 \\ c & 0 & 0 \\ d & 0.33 & 0 \end{array}$$

test 3

$$\begin{bmatrix} 2 & 5 & 7 \end{bmatrix}^{-1} = \frac{1}{2-25} \begin{bmatrix} 3 & -5 \end{bmatrix} = \begin{bmatrix} -0.2 & 0.357 \end{bmatrix}$$

$$\begin{bmatrix} 2 & 5 \\ 4 & 3 \end{bmatrix}^{-1} = \frac{1}{6-20} \begin{bmatrix} 3 & -5 \\ -4 & 2 \end{bmatrix} = \begin{bmatrix} -0.2 & 0.357 \\ 0.285 & -0.142 \end{bmatrix}$$

outcomes

```

# CASE 1
# aOut = 0200 (sign=0)
# bOut = 0100 (sign=1)
# cOut = 0100 (sign=1)
# dOut = 0100 (sign=0)

# === CASE 2 ===
# aOut = 007e (sign=0)
# bOut = 0000 (sign=0)
# cOut = 0000 (sign=0)
# dOut = 0054 (sign=0)

# === CASE 3 ===
# aOut = 0036 (sign=1)
# bOut = 005a (sign=0)
# cOut = 0048 (sign=0)
# dOut = 0024 (sign=1)

```

0.54  
 0.33  
 0.24  
 0.35  
 0.28  
 0.14

Waves:

