Given a wavelet transform with analysis matrix T_a, recall we may write

$$T_a x = \begin{bmatrix} u \\ \hline v \end{bmatrix} x = \begin{bmatrix} ux \\ \hline vx \end{bmatrix} = \begin{bmatrix} s \\ d \end{bmatrix}$$

If we consider the 2-d wavelet transform

$$T_a Z (T_a)^t = \begin{bmatrix} ss & sd \\ ds & dd \end{bmatrix}$$

how can we express the block entries in terms of Z, u, v, u^t, v^t?

Apply the 2-d Haar Wavelet transform to the signals

$$\begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix} \quad \text{and} \quad \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$