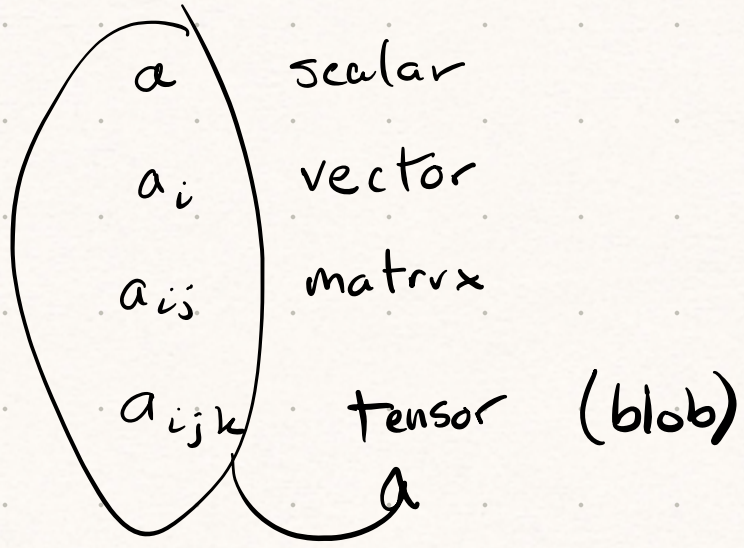
CS: How many indices?



order 4
[N, C, H, W]

P05 #3,4

a)
$$\begin{bmatrix} 2 & 2 & 2 \\ 2 & 2 & 2 \\ 0 & 0 & 0 \end{bmatrix}$$

b)
$$\begin{bmatrix} 0 & 2 & 2 \\ 0 & 2 & 2 \\ 0 & 0 & 0 \end{bmatrix}$$

c)
$$\begin{bmatrix} 2 & 2 & 2 \\ 0 & 2 & 2 \\ 0 & 0 & 2 \end{bmatrix}$$

Use this differentiation filter: $[-1 \ 0 \ 1]$

cross correlate in x, again in y

based on the problem desc. I'd also take $\frac{1}{2}[-1 \ 0 \ 1]$

padding?

$$\begin{matrix} 2 & 2 & 2 & 2 & 2 \\ 2 & & & & 2 \\ 2 & & & & 2 \\ 0 & & & & 0 \\ 0 & 0 & 0 & 0 & 0 \end{matrix}$$
$$\begin{bmatrix} 2 & 2 & 2 \\ 2 & 2 & 2 \\ 0 & 0 & 0 \end{bmatrix} \times [-1 \ 0 \ 1] = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix} = I_x$$

$$\begin{matrix} 2 & 2 & 2 & 2 & 2 \\ 2 & 2 & 2 & 2 & 2 \\ 2 & 2 & 2 & 2 & 2 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{matrix} \times \begin{bmatrix} -1 \\ 0 \\ 1 \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 \\ 2 & 2 & 2 \\ 2 & 2 & 2 \end{bmatrix} = I_y$$

$$\begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix} = I_x \qquad \begin{bmatrix} 0 & 0 & 0 \\ 2 & 2 & 2 \\ 2 & 2 & 2 \end{bmatrix} = I_y$$

$$I_x^2 \qquad I_{xy} \qquad I_y^2$$

$$I_x^2 = I_x \cdot I_x = 0$$

$$I_{xy} = I_x \cdot I_y = 0$$

$$I_y^2 = \begin{bmatrix} 0 & 0 & 0 \\ 2 & 2 & 2 \\ 2 & 2 & 2 \end{bmatrix} \cdot \begin{bmatrix} 0 & 0 & 0 \\ 2 & 2 & 2 \\ 2 & 2 & 2 \end{bmatrix} = 24$$

$$\begin{bmatrix} 0 & 0 \\ 0 & 24 \end{bmatrix} \quad \lambda = 0, 24$$