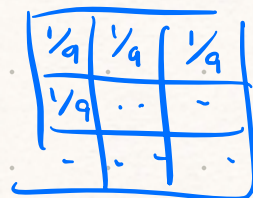
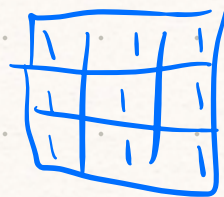
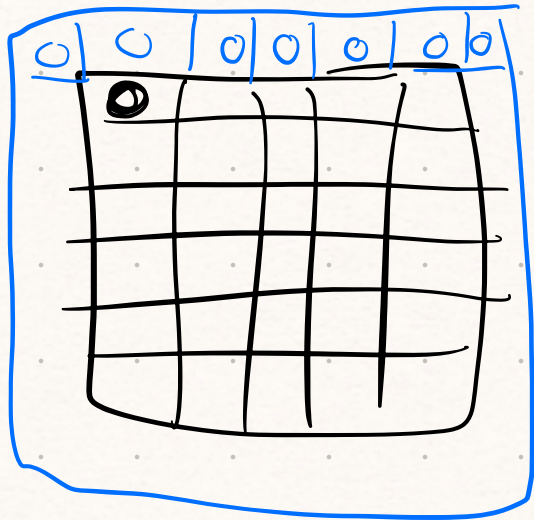


only collect
in range

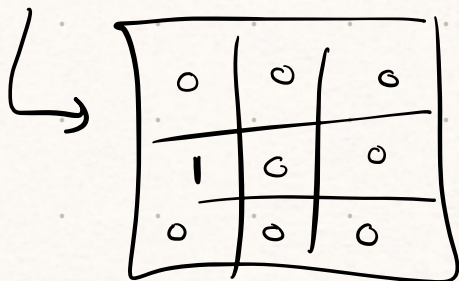
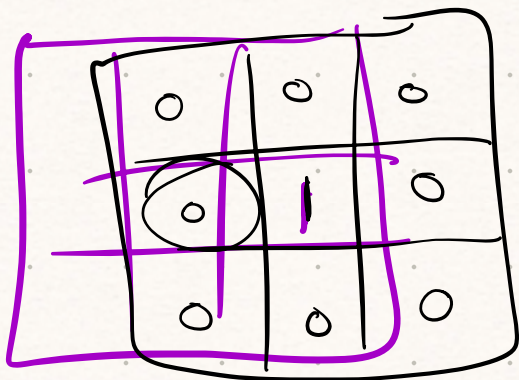
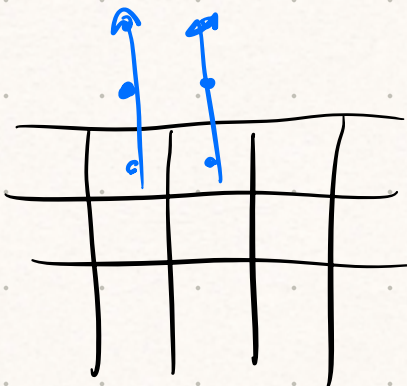
= zero
pad (#1)



repeat (#2)

cyclic

(#3)



shift to left

0	0	0
0	1	2
0	4	5

image

filter

filter \otimes image

1	2	3
4	5	6
7	8	9

output

image \otimes filter

9	8	7
6	5	4
3	2	1

output

? flip lr
flipud

$$f \otimes g = f * (\text{flip}(\text{flip}(g)))$$

Sharpening

$$D = \begin{bmatrix} 2 \end{bmatrix}$$

$$\begin{aligned}
 I' &= I + (I - I * G) \\
 &= (I + I) - I * G \\
 &= (I * D) - I * G \\
 &= I * (D - G)
 \end{aligned}$$