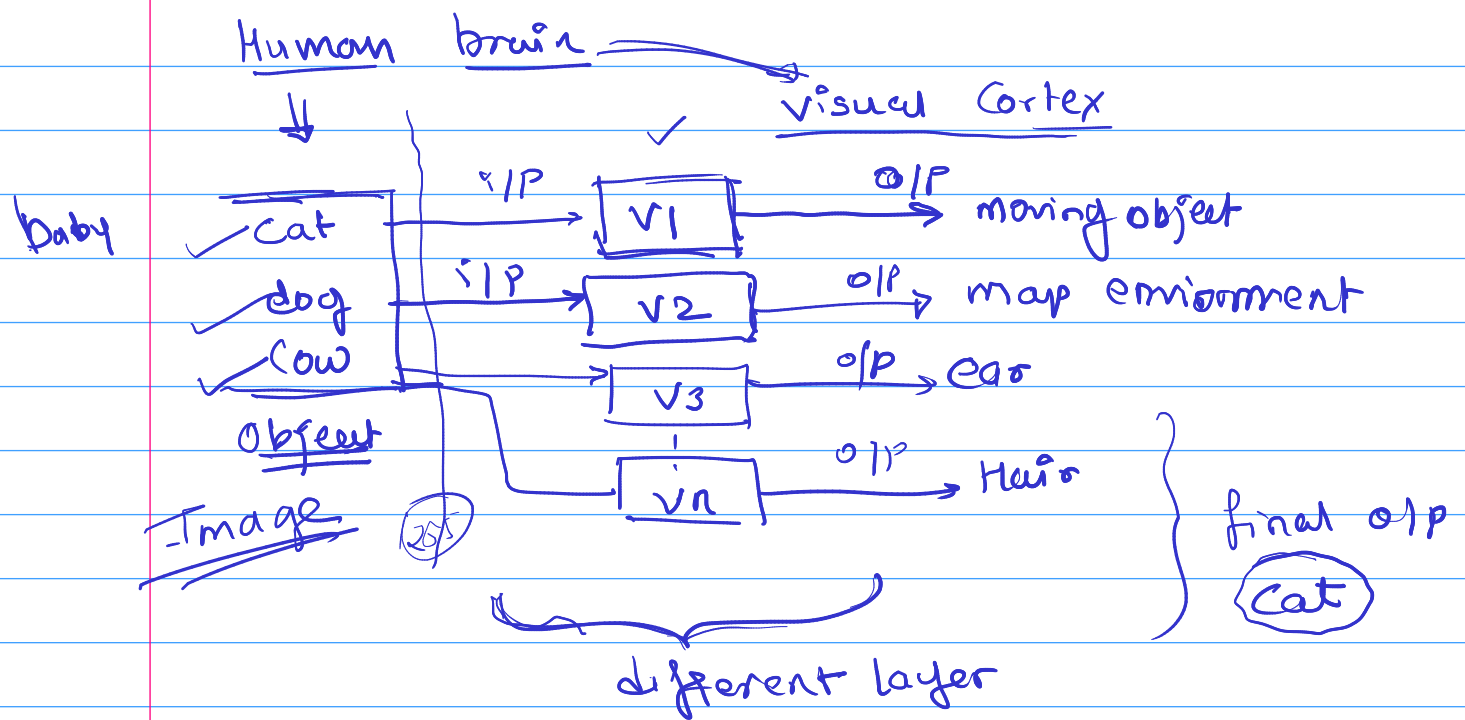


CNN → Convolutional Neural Network (Image & video)



Convolutional (Image)

$\text{BIN} \Rightarrow 1 \text{ channel}$
 Image

0	122	0	1	2
0	143		0	3
0	200	155	130	240
0	203	260	0	0
0	0	0	0	0

5x5 pixel image.

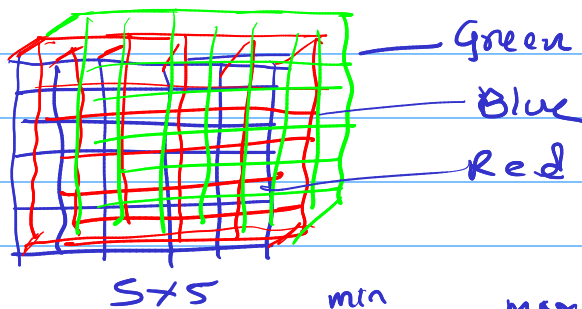
$5 \times 5 \times 1 \rightarrow 1 \text{ channel}$

pixel range

0-255

white black

RGB
3 channel
Images:

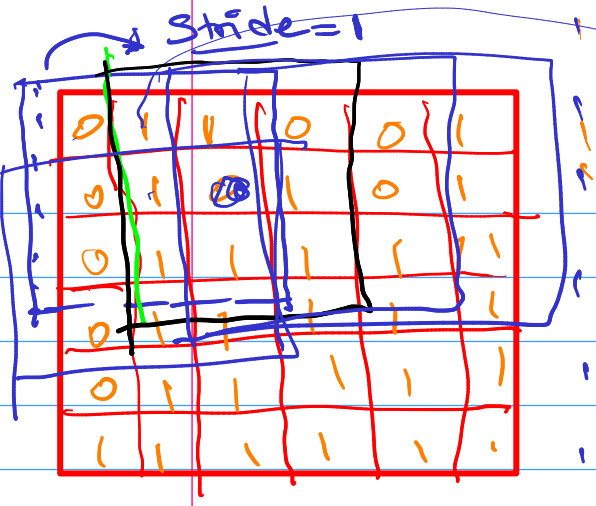


0-255

$$5 \times 5 \times 3$$

5x5 min max
0 -255
min-max scaling = every pixel / 255

$$0 + 0 + (-1) + 0 + 0 + 0 + 0 + 0 + (-1)$$



6x6x1
object

1	0	1
2	0	2
1	0	-1

3x3

Horizontal
edge layer

-1	1	2
0	0	0
1	1	1

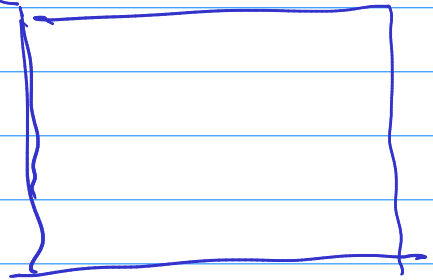
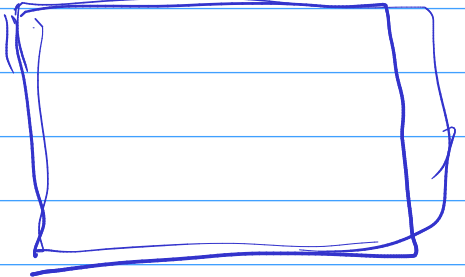
Vertical

Round object layer
straight object layer

multiple layers.

1. o/p = 4x4

-2	0	0	1
0	-2	0	1
0	2	3	1
0	0	1	0



original image

6x6 \rightarrow filter 3x3 $\xrightarrow{\text{o/p}}$ 4x4 \leftarrow information miss

$$\text{o/p image} = \frac{n - f + 1}{s} = \frac{6 - 3 + 1}{1}$$

$$= 3 + 1 = 4$$

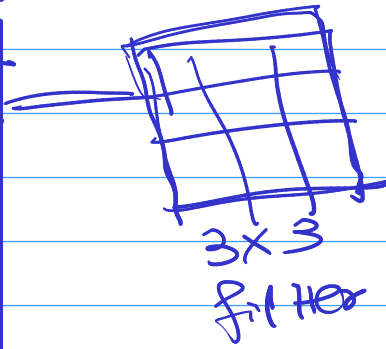
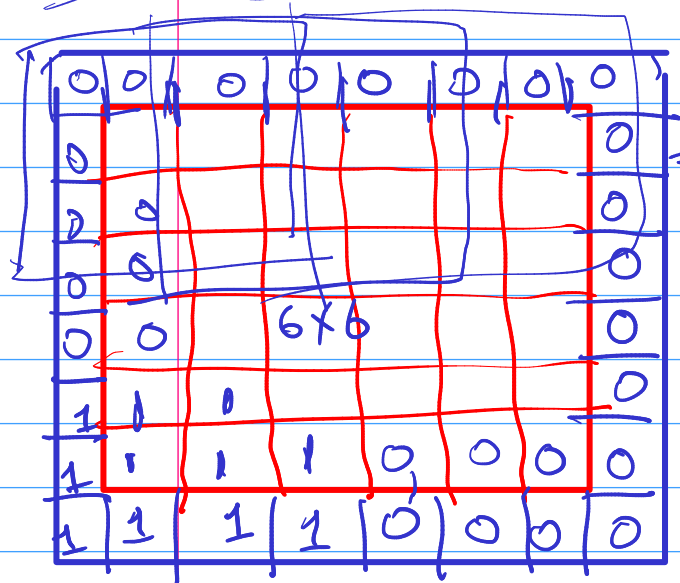
s \rightarrow Stride = 1

n = 6

f = 3

\rightarrow o/p
4x4

Padding layer - zero padding
- nearest padding



= o/p 6x6

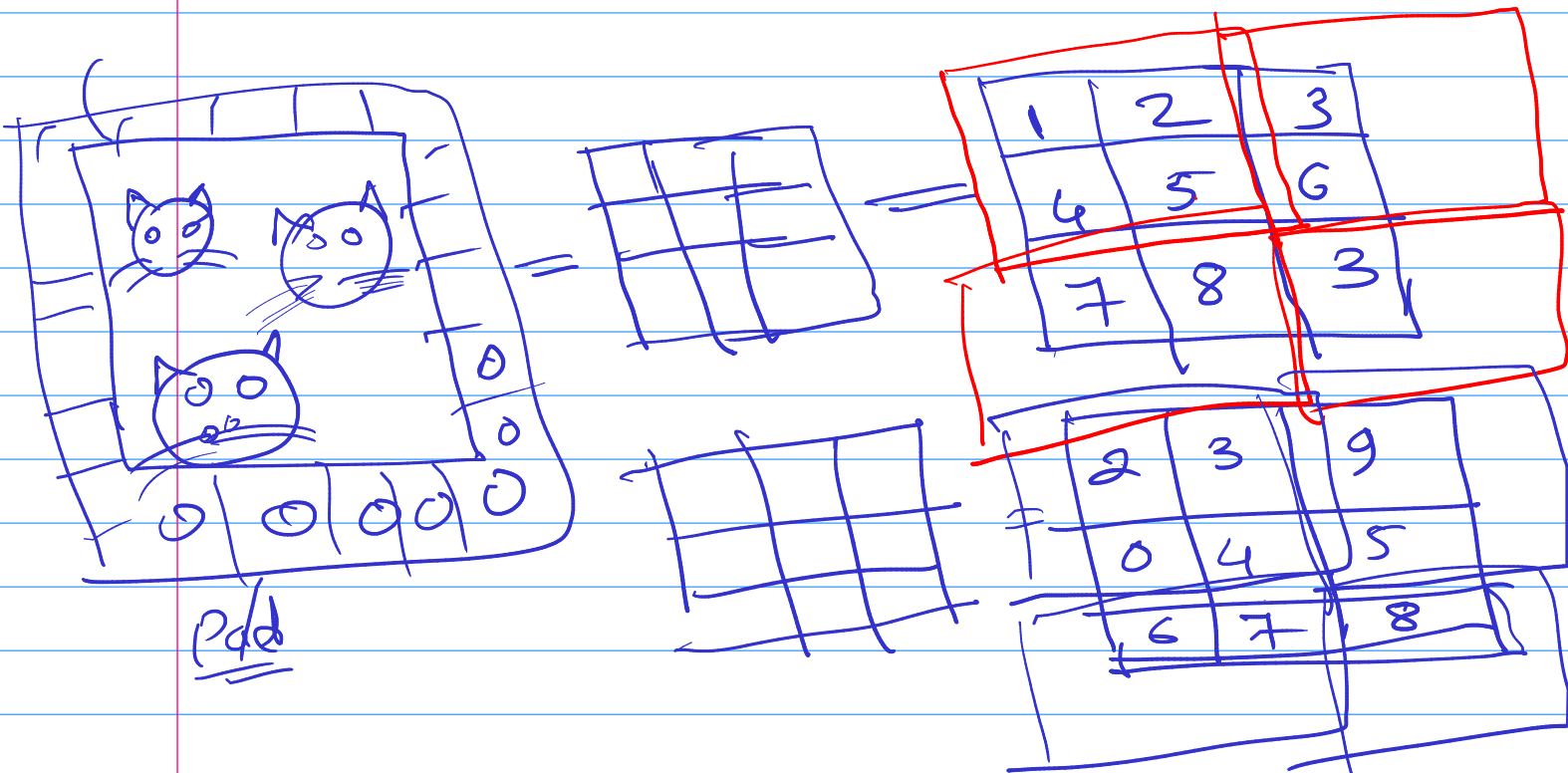
$$\text{o/p layer pixels} = \frac{n - f + 1}{s}$$

$$= \frac{8 - 3 + 1}{1} = 5 + 1 = 6$$

s → stride

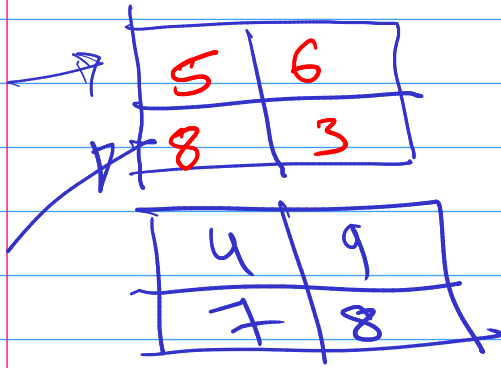
i/p

Pooling layer



① max pooling (2x2)

→ strid = 2



② min pooling

③ Avg - pooling

↓
flattening layer

