

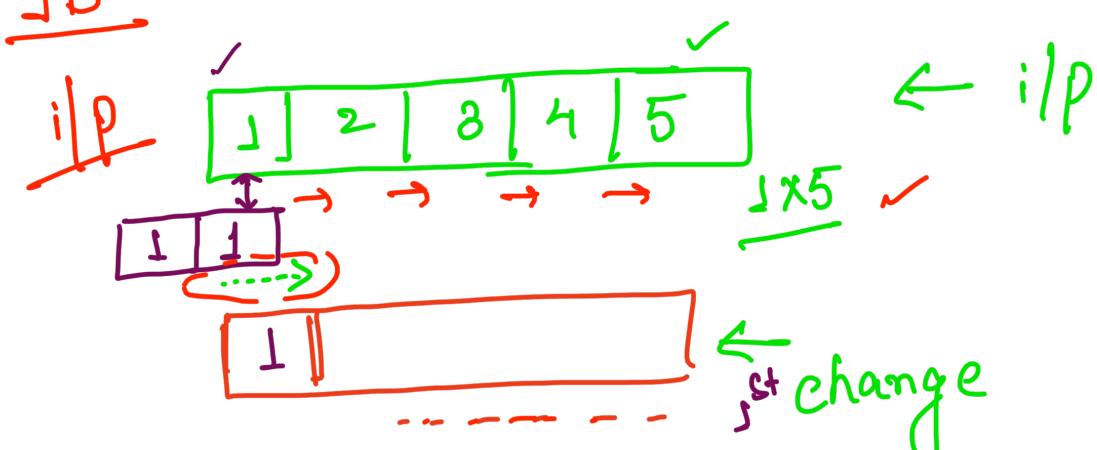
Convolutional Network (N|w)

1. Convolution ✓
 2. Stride ✓
 3. Pooling
 4. Activation Function
 5. Fully Connected Layers
 6. Padding ✓

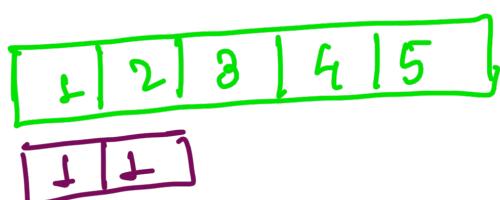
Convolution

C: ✓

10



」△ = 1



$$|x+2| = 3$$



1	2	3	4	5
上	上			

$$2x + 3y = 5$$



1	3	5	7	9	5
.....	<u>6 X 1</u>

while ending what
will be the size of this
array?

General formula:

i/p: $m \times 1$

c : $n \times 1$

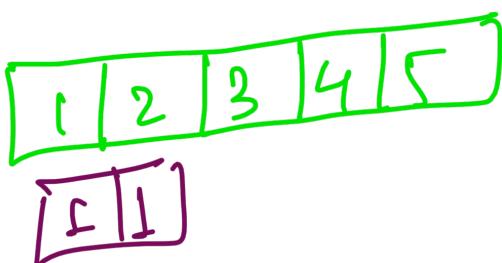
o/p: $m+n-1$

↳ Size

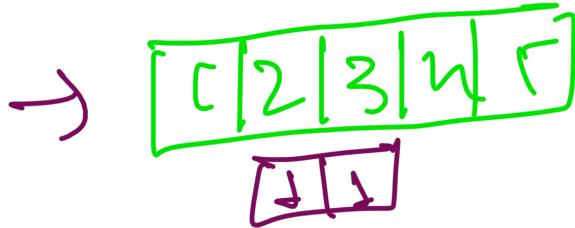
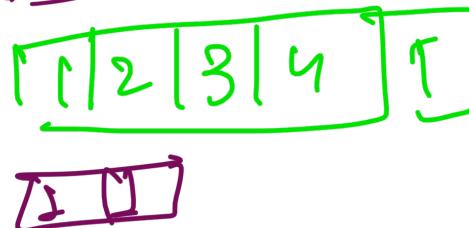
Movement:

Slide

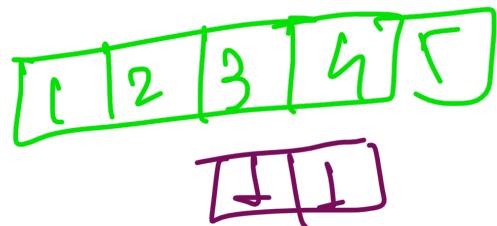
$S = 1$



$S = 2$



⋮ →

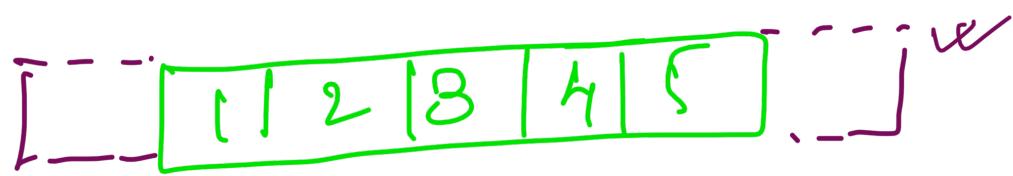


$\frac{2 \times 1}{df}$

Based on value of slide the
output size change

Padding ✓

$5 \times 1 \rightarrow 7 \times 1$



Add elements \rightarrow Size of the original array changes.

2D

Matrix

0

4×5

Resolution

What is the resolution
of the image?

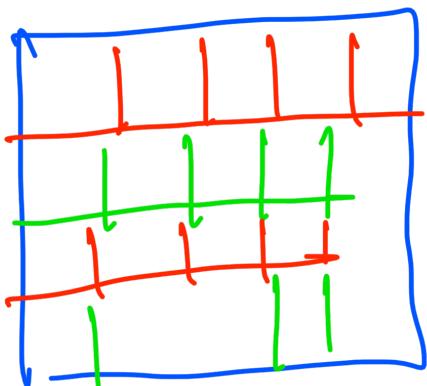
• \leftarrow pixel

Image

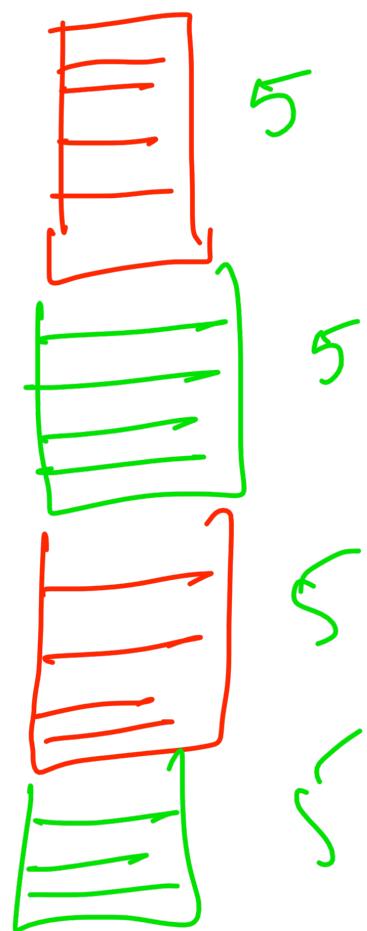
Matrix \rightarrow Array ~~Array~~

4×5

20 pixel



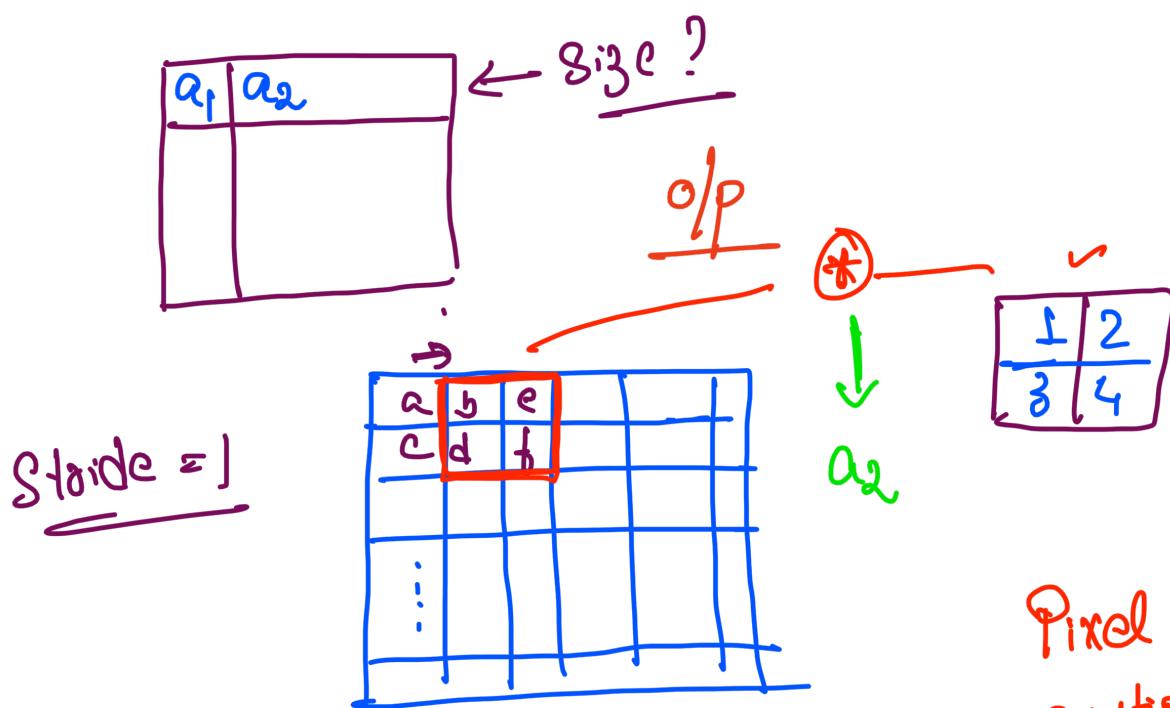
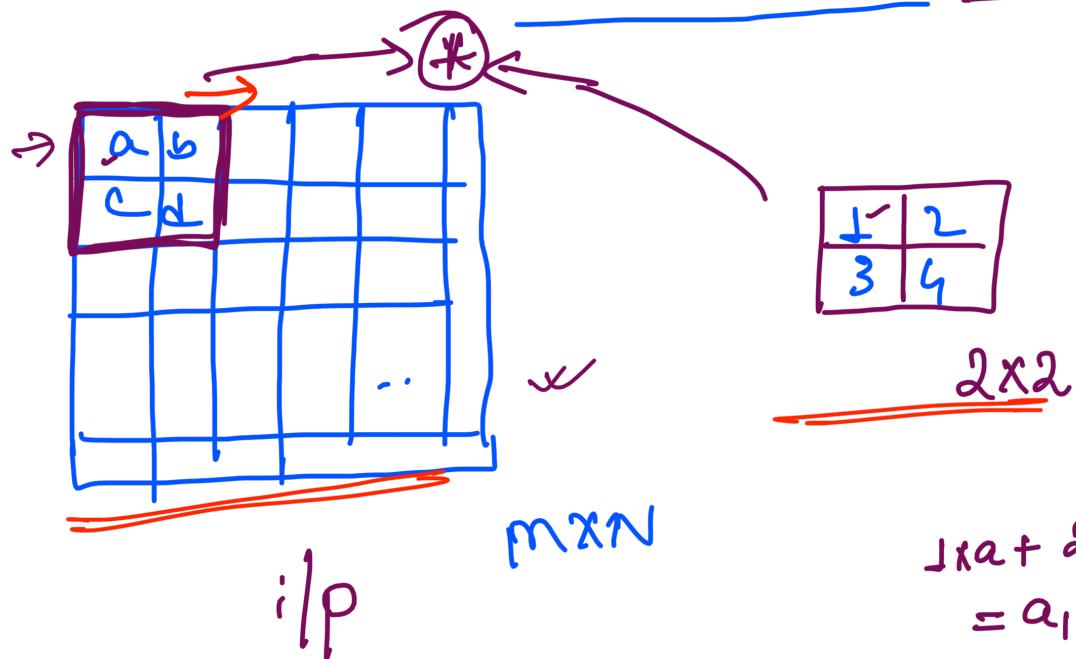
1D



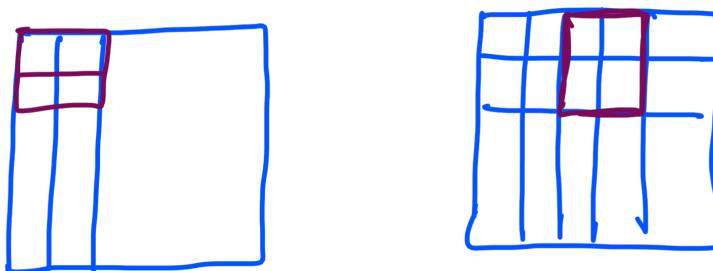
$$4 \times 5 = 20$$



Convolutional

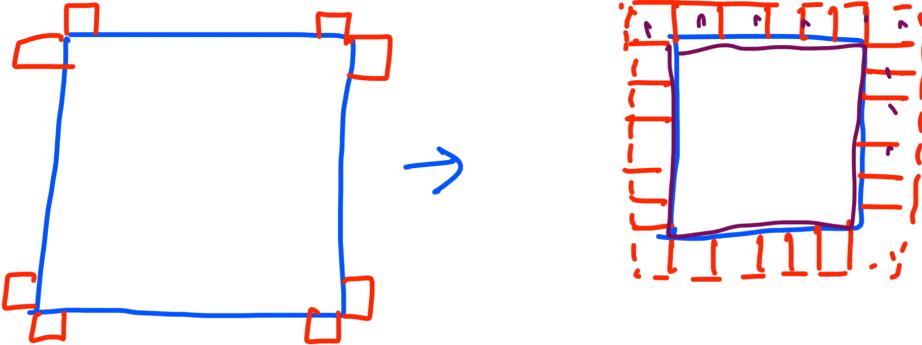


Pixel wise multiplication addition

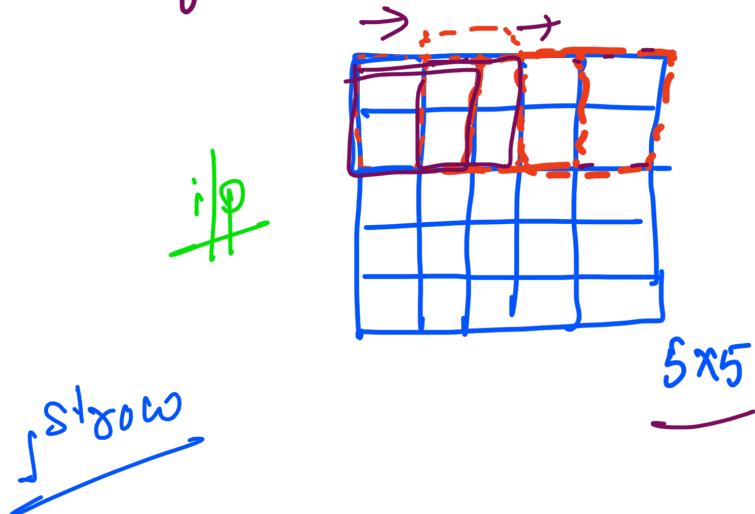


Stride = 2

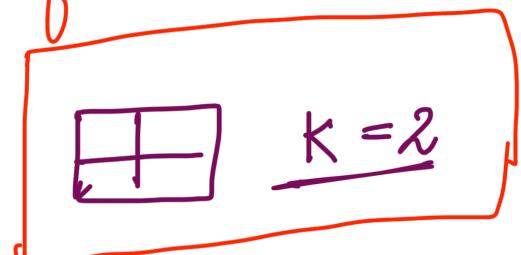
Padding



Size of the output



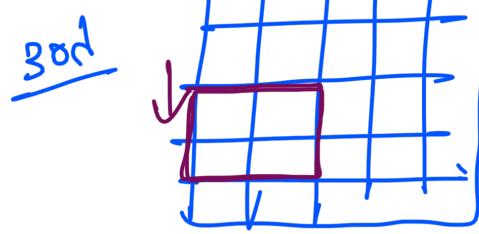
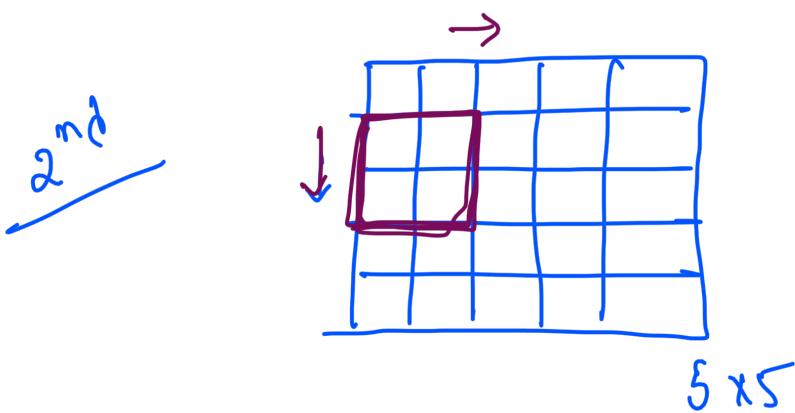
feature extractor

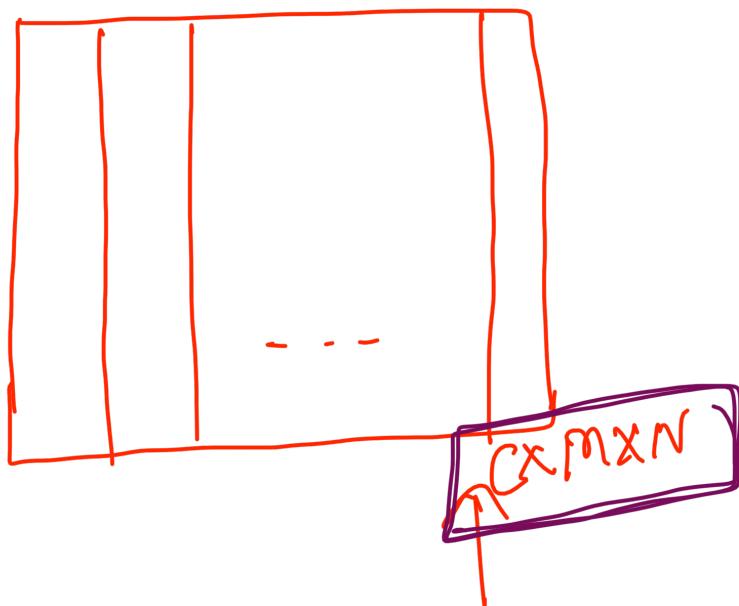
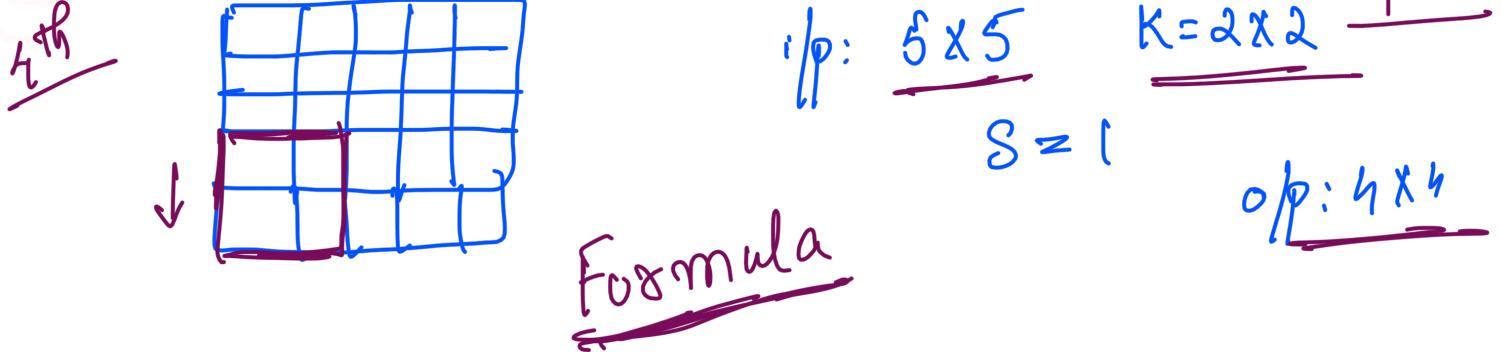


Stride = 1

a_1	a_2	a_3	a_4
b_1	b_2	b_3	b_4
c_1	c_2	c_3	c_4
d_1	d_2	d_3	d_4

$\overline{M} \times 4$



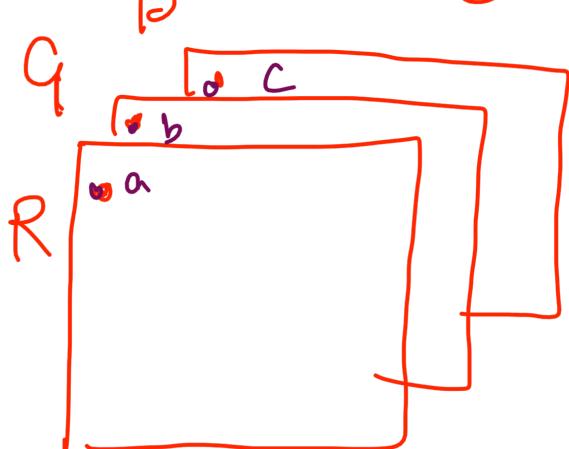


MNIST

digit recognition
dataset

gray channel
image

Channel = 1



Color image

RGB

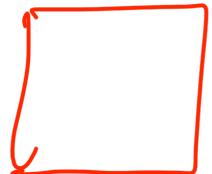
channel = 3

(a, b, c)

Gray Channel

$C \times M \times N$

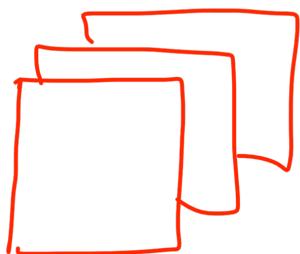
$C=1$



RGB Image

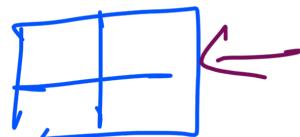
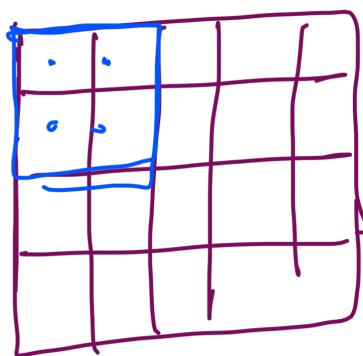
$C \times M \times N$

$C=3$



Kernal

feature
extractor



$0+0+0+0$ → 0

$J \times M \times N$

