



10	10	10	0	0	0
10	10	10	0	0	0
10	10	10	0	0	0
10	10	10	0	0	0
10	10	10	0	0	0
10	10	10	0	0	0

filter / kernel

1	0	-1
1	0	-1
1	0	-1

0	30	30	0
0	30	30	0
0	30	30	0
0	30	30	0

$1 \times 10 + 1 \times 10 + 1 \times 10 + 0 + (-1 \times 0 - 1 \times 0 - 1 \times 0)$
 $30 + 0 - 30 = 0$

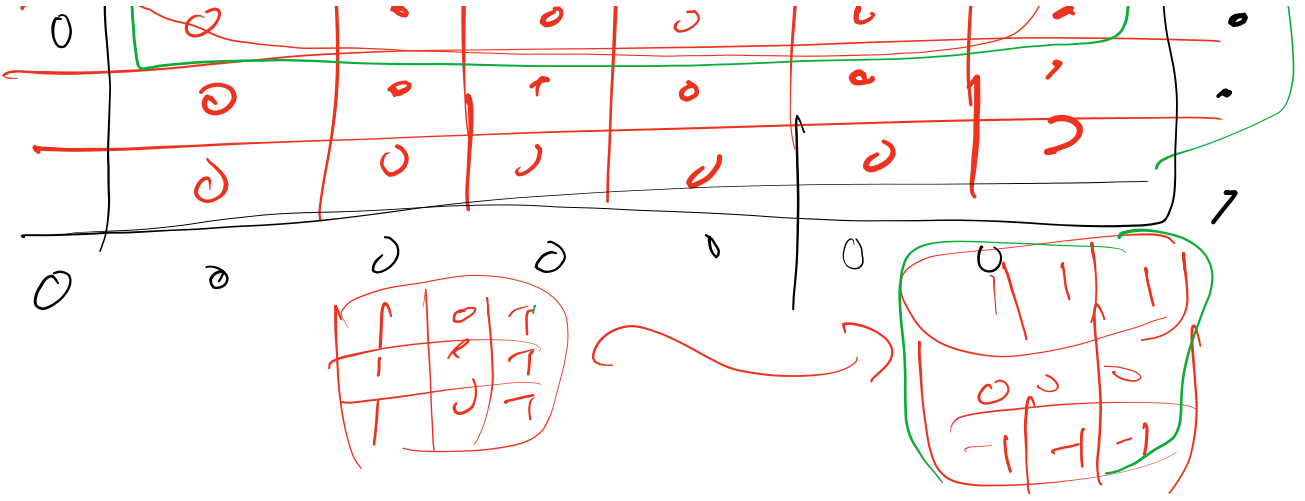
$1 \times 10 + 30 + 0 + 0 = 30$

$30 + 0 + 0 = 30$

output feature

0	30	30	0
0	30	30	0
0	30	30	0
0	30	30	0

0	10	10	10	10	10	0
0	10	10	10	10	10	0
0	10	10	10	10	10	0



6x6 input | $\frac{3 \times 3}{f/Kernel}$ \rightarrow 4x4 output

$$W - 3 + 1$$

$$6 - 3 + 1 =$$

4

no of input channels

CNNs.

$$(K_h \times K_w \times C_{in} + 1) C_{out}$$

$$(3 \times 3 \times 1 + 1) \times 1$$

$$= 9 + 1 = 10$$

NN
↳

6x6

1

⋮

36

1

2

⋮

9

hidden

1

2

⋮

16

16

36x

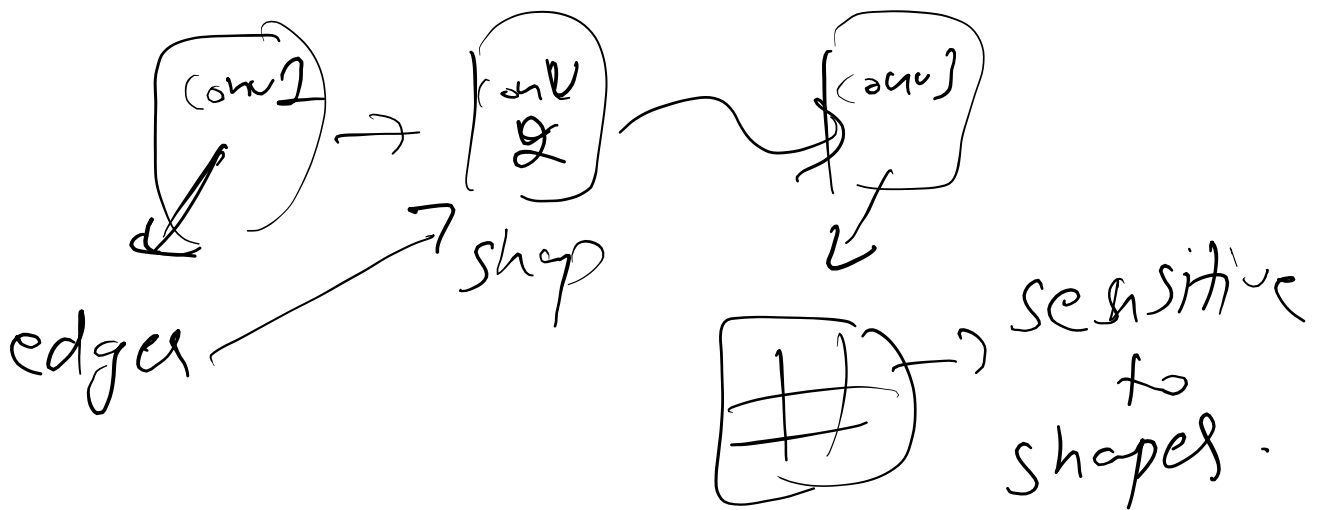
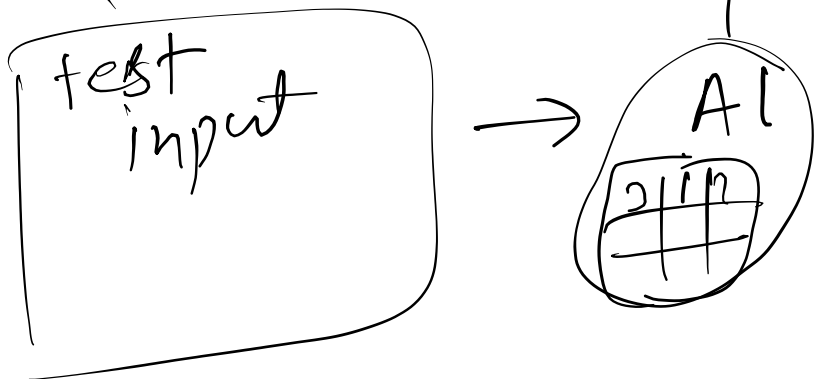
$$\underline{36 \times 9 + 9} + 9 \times 16 + 16 =$$

$$333 + 160 =$$

493

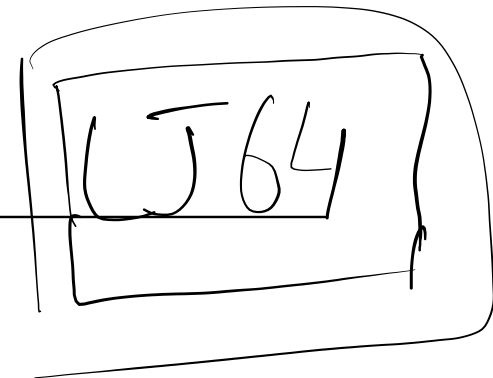
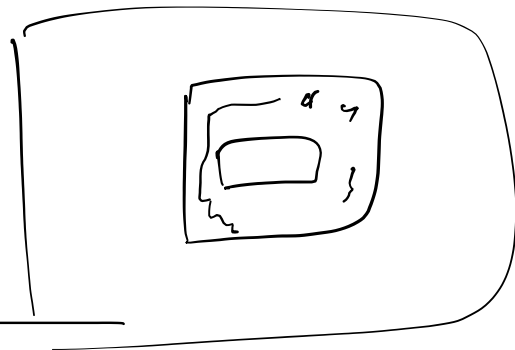
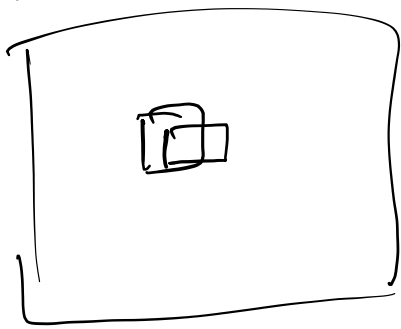
=> model.save('x72.pt')
m

$$\begin{bmatrix} 3 & 0 & 1 \\ 2 & 0 & 5 \\ 1 & 0 & 9 \end{bmatrix}$$



Page 5 Day 1

Sunday, 10 May 2026 14:01



6x6

$$\underline{W} - K + 1$$

$$6 - 3 + 1 = 4$$

padding 4x4

$$\textcircled{\underline{W}} + 2\textcircled{P} - \textcircled{K} + 1$$

$$6 + \underline{2(2)} - 3 + 1 = \textcircled{6}$$

$$6 + 2(2) - 3 + 1 =$$

$$\textcircled{7 \times 7} \text{ (image)} \quad \left| \quad \begin{matrix} k=0 \\ 5 \times 5 \end{matrix} \right.$$

$$w + 2p - k + 1$$

$$7 + 2(0) - 5 + 1$$

$$7 - 5 + 1 = \textcircled{3}$$

$$7 + 2(1) - 5 + 1 = \textcircled{5}$$

$$9 - 5 + 1 = \textcircled{5}$$

$$7 + 2(2) - 5 + 1$$

$$7 + 4 - 5 + 1 = \textcircled{7}$$

$$7 + 2(\textcircled{p}) - 5 + 1 = 7$$

Page 8 Day 1

Sunday, 10 May 2026

14:56

$$\frac{w + 2p + \cancel{k} + 1}{s}$$

$s > 1$

