

Question 1

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Given $\text{stride} = 1$
 $\text{padding} = 1$
 $\text{Max Polling} = (2, 2)$

After padding, the input will be like this.
0 is used for the padding.

0	0	0	0	0	0	0
0	0	1	1	0	1	0
0	0	1	1	0	1	0
0	0	1	1	0	1	0
0	0	1	1	0	1	0
0	0	1	1	0	1	0
0	0	0	0	0	0	0

Now

1	0	1
1	1	1
0	0	1

Filter 1

0	0	1
1	0	0
0	1	1

Filter 2

Now, we will use both filter with in-Input and add them to get final feature

Here, For 1st value, Using Filter 1:-

~~0x0 +~~

$$\underbrace{0 \times 1 + 0 \times 0 + 1 \times 0}_{\text{Row 1}} + \underbrace{1 \times 0 + 1 \times 0 + 1 \times 1}_{\text{Row 2}} + \underbrace{0 \times 0 + 0 \times 0}_{\text{Row 3}}$$

$$+ 1 \times 1 = 2$$

From filter 2:

$$0 \times 0 + 0 \times 0 + 0 \times 1 + 1 \times 0 + 0 \times 0 + 0 \times 1 + 0 \times 0 + 0 \times 1 + 1 \times 1 = 1$$

∴ First value will be = $2 + 1 = 3$

Like that we prepare this result.

3	5	4	5	2
5	7	5	8	2
5	7	5	8	2
5	7	5	8	2
3	4	4	6	1

Now we will Apply Max pooling -
 We know that max.pooling = (2, 2)

$$(i) \begin{bmatrix} 3 & 5 \\ 5 & 7 \end{bmatrix} = 7$$

$$(ii) \begin{bmatrix} 4 & 5 \\ 5 & 8 \end{bmatrix} = 8$$

$$(iii) \begin{bmatrix} 2 \\ 2 \end{bmatrix} = 2$$

$$(iv) \begin{bmatrix} 5 & 7 \\ 5 & 7 \end{bmatrix} = 7$$

$$(v) \begin{bmatrix} 5 & 8 \\ 5 & 8 \end{bmatrix} = 8$$

$$(vi) \begin{bmatrix} 2 \\ 2 \end{bmatrix} = 2$$

$$(vii) \begin{bmatrix} 3 & 4 \end{bmatrix} = 4$$

$$(viii) \begin{bmatrix} 4 & 6 \end{bmatrix} = 6$$

$$(ix) \begin{bmatrix} 1 \end{bmatrix} = 1$$

\therefore Final Result.

7	8	2
7	8	2
4	6	1