BUBT | BANGLADESH UNIVERSITY OF BUSINESS AND TECHNOLOGY

# ASSIGNMENT

**ASSIGNMENT NO** - 02

Course NO : CSE 477

Course Name : Neural Network and Fuzzy Systems

Submission Date : 02/12/2023

| **Submitted To** |
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# Ans to the Q.No : 1

Given,

Stride = 1

Padding = 1

Max Polling = (2,2)

Input

| | | | | |
|---|---|---|---|---|
| 0 | 1 | 1 | 0 | 1 |
| 0 | 1 | 1 | 0 | 1 |
| 0 | 1 | 1 | 0 | 1 |
| 0 | 1 | 1 | 0 | 1 |
| 0 | 1 | 1 | 0 | 1 |

Filter 1

| | | |
|---|---|---|
| 1 | 0 | 1 |
| 1 | 1 | 1 |
| 0 | 0 | 1 |

Filter 2

| | | |
|---|---|---|
| 0 | 0 | 1 |
| 1 | 0 | 0 |
| 0 | 1 | 1 |

Let's perform the convolution for each filter,

Convolution with Filter 1 –

| | | | | |
|---|---|---|---|---|
| 0 | 2 | 4 | 2 | 1 |
| 1 | 4 | 7 | 4 | 2 |
| 1 | 4 | 7 | 4 | 2 |
| 1 | 4 | 7 | 4 | 2 |
| 0 | 2 | 4 | 2 | 1 |

Now, convolution with Filter 2 –

| | | | | |
|---|---|---|---|---|
| 0 | 1 | 3 | 3 | 1 |
| 1 | 2 | 4 | 3 | 1 |
| 1 | 3 | 6 | 4 | 2 |
| 1 | 3 | 5 | 3 | 1 |
| 0 | 1 | 2 | 1 | 0 |

After convolving with each filter, you see that the output sizes are the same as the input size due to the chosen padding and stride.

Next, we will implement max pooling using a 2×2 window on each of these outputs, effectively reducing their size by half.

Max Pooling (2x2) for Filter 1 output –

| | |
|---|---|
| 4 | 4 |
| 4 | 4 |

Max Pooling (2x2) for Filter 2 output –

| | |
|---|---|
| 2 | 3 |
| 3 | 3 |