Question 8:

apsara

Date: ___/___/___

Problem 2 →

Dimension of Convolution.

Assuming padding to be in each direction of size 'z'.

$$\text{Size of convolution} = \frac{(W-F+1+2z)}{S} \times \frac{(H-F+1+2z)}{S} \times \text{No. of channels.}$$

Recursively solving for n-convolutions.

$$\frac{W}{S^n} + \frac{(F-S-2z)\left(\frac{1}{S^n}-1\right)}{S-1} \times \frac{H}{S^n} + \frac{(F-S-2z)\left(\frac{1}{S^n}-1\right)}{S-1} \times \text{No. of channels}$$

Number of Addition and Multiplications.

For each point of the output,

$F^2 + F^2$

(Multiplication + Addition)

$$\text{Total} = \frac{(W-F+1+2z)}{S} \times \frac{(H-F+1+2z)}{S} \times 2F^2$$

For n convolutions.

$$\frac{W}{S^n} + \frac{(F-S-2z)\left(\frac{1}{S^n}-1\right)}{(S-1)} \times \frac{H}{S^n} + \frac{(F-S-2z)\left(\frac{1}{S^n}-1\right)}{S-1} \times F^2 \times \text{No. of Chan}$$

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