

Ans. to the Ques. No. 3

input -  $(64 \times 64)$   
 filters - 7,  $(5 \times 5)$   
 stride - 2  
 no padding of 0  
 max pool -  $(2 \times 2)$

# 1st set of convolution and max pooling

$$\begin{aligned} \text{width} &= [(W + 2P - F) / s] + 1 \\ &= [(64 + 0 - 5) / 2] + 1 \\ &= 30.5 \sim 30 \end{aligned}$$

$$\begin{array}{l} W = 64 \\ P = 0 \\ s = 2 \\ F = 5 \\ H = 64 \end{array}$$

$$\begin{aligned} \text{height} &= [(H + 2P - F) / s] + 1 \\ &= [(64 + 0 - 5) / 2] + 1 \\ &= 30.5 \sim 31 \end{aligned}$$

tensor  $(31 \times 31)$

after convolution, feature map value =  $7 \times 31 \times 31$

$$\frac{31}{2} = 15.5 \sim 16$$

Max pooling =  $7 \times 16 \times 16$

# 2nd set of convolution and max pooling

$$\begin{aligned} \text{width} &= [(W + 2P - F) / s] + 1 \\ &= [(16 + 0 - 5) / 2] + 1 \\ &= 6.5 \sim 7 \end{aligned}$$

$$\begin{array}{l} W = 16 \\ P = 0 \\ s = 2 \\ F = 5 \\ H = 16 \end{array}$$

$$\begin{aligned}\text{height} &= [(H + 2P - F) / s] + 1 \\ &= [(16 + 0 - 5) / 2] + 1 \\ &= 6.5 \sim 7\end{aligned}$$

tensor (7x7)

after convolution, feature map value = 7x7x7

$$\frac{7}{2} = 3.5 \sim 4$$

Max pooling = 7x4x4

#3rd set of convolution and max pooling

$$\begin{aligned}\text{width} &= [(W + 2P - F) / s] + 1 \\ &= [(4 - 5) / 2] + 1 \\ &= 0.5 \sim 1\end{aligned}$$

$$\begin{array}{|l} W = 4 \\ s = 2 \\ F = 5 \\ P = 0 \\ H = 4 \end{array}$$

$$\begin{aligned}\text{height} &= [(H + 2P - F) / s] + 1 \\ &= [(4 - 5) / 2] + 1 \\ &= 0.5 \sim 1\end{aligned}$$

tensor (1x1)

after convolution, feature map value = 7x1x1

$$\frac{1}{2} = 0.5 \sim 1$$

Max pooling = 7x1x1

$\therefore$  number of nodes in flattening layer =  $7 \times 1 \times 1$   
= 7

[here, the filters were fixed]

