$X_{6\times6} = \begin{bmatrix} 7 & 5 & 0 & 0 & 3 & 2 \\ 6 & 4 & 5 & 1 & 4 & 8 \\ 9 & 0 & 2 & 2 & 5 & 4 \\ 6 & 3 & 4 & 7 & 9 & 8 \\ 5 & 7 & 5 & 6 & 9 & 0 \\ 7 & 9 & 0 & 8 & 2 & 3 \end{bmatrix}$ $F_{3\times3} = \begin{bmatrix} 1 & 0 & -1 \\ 2 & 0 & -2 \\ 1 & 0 & -1 \end{bmatrix}$

3.1) Dimensions of input: $6 \times 6 \times 1$
Dimensions of kernel: 3×3.
parameters = ((Kernel width)^2 × (# input channels) × (# kernels)) + (# biases)
Kernel width = 3
input channels = 1
kernels = 1
biases = # kernels = 1

So, # parameters = $(3^2 \times 1 \times 1) + 1$
= 10 parameters in kernel f

3.2) $(1\times7)+(0\times5)+(-1\times0)$
$+(2\times6)+(0\times4)+(-2\times5)$
$+(1\times9)+(0\times0)+(-1\times2) = 16$

$(1\times5)+(0\times0)+(-1\times0)$
$+(2\times4)+(0\times5)+(-2\times1)$
$+(1\times0)+(0\times2)+(-1\times2) = 9$

$(1\times0)+(6\times6)+(-1\times3)$
$+(2\times5)+(0\times1)+(-2\times4)$
$+(1\times2)+(0\times2)+(-1\times5) = -4$

$(1\times6)+(0\times3)+(-1\times2)$
$+(2\times1)+(0\times4)+(-2\times8)$
$+(1\times2)+(0\times5)+(-1\times4) = -18$

next row

$(1\times6)+(0\times4)+(-1\times9)$
$+(2\times9)+(0\times0)+(-2\times2)$
$+(1\times6)+(0\times3)+(-1\times4) = 17$

$$X = \begin{bmatrix} 7 & 5 & 0 & 0 & 3 & 2 \\ 6 & 4 & 5 & 1 & 4 & 8 \\ 9 & 0 & 2 & 2 & 5 & 4 \\ 6 & 3 & 4 & 7 & 9 & 8 \\ 5 & 7 & 5 & 6 & 9 & 0 \\ 7 & 9 & 0 & 8 & 2 & 3 \end{bmatrix} \qquad F = \begin{bmatrix} 1 & 0 & -1 \\ 2 & 0 & -2 \\ 1 & 0 & -1 \end{bmatrix}$$

$$(1\times4)+(0\times5)+(-1\times1)$$
$$+(2\times0)+(0\times2)+(-2\times2)$$
$$+(1\times3)+(0\times4)+(-1\times7) = -5$$

$$(1\times5)+(0\times1)+(-1\times4)$$
$$+(2\times2)+(0\times2)+(-2\times5)$$
$$+(1\times4)+(0\times7)+(-1\times9) = -10$$

$$(1\times1)+(0\times4)+(-1\times8)$$
$$+(2\times2)+(0\times5)+(-2\times4)$$
$$+(1\times7)+(0\times9)+(-1\times8) = -12$$

next row

$$(1\times9)+(0\times0)+(-1\times2)$$
$$+(2\times6)+(0\times3)+(-2\times4)$$
$$+(1\times5)+(0\times7)+(-1\times5) = 11$$

$$(1\times6)+(0\times2)+(-1\times2)$$
$$+(2\times3)+(0\times4)+(-2\times7)$$
$$+(1\times7)+(0\times5)+(-1\times6) = -9$$

$$(1\times2)+(0\times2)+(-1\times5)$$
$$+(2\times4)+(0\times7)+(-2\times9)$$
$$+(1\times5)+(0\times6)+(-1\times9) = -17$$

$$(1\times2)+(0\times5)+(-1\times4)$$
$$+(2\times7)+(0\times9)+(-2\times8)$$
$$+(1\times6)+(0\times9)+(-1\times0) = 2$$

next row

$(1\times6)+(0\times3)+(-1\times4)$
$+(2\times5)+(0\times7)+(-2\times5)$
$+(1\times7)+(0\times9)+(-1\times0)=9$

$(1\times3)+(0\times4)+(-1\times7)$
$+(2\times7)+(0\times5)+(-2\times6)$
$+(1\times9)+(0\times0)+(-1\times8)=-1$

$(1\times4)+(0\times7)+(-1\times9)$
$+(2\times5)+(0\times6)+(-2\times9)$
$+(1\times0)+(0\times8)+(-1\times2)=-15$

$(1\times7)+(0\times9)+(-1\times8)$
$+(2\times6)+(0\times9)+(-2\times0)$
$+(1\times8)+(0\times2)+(-1\times3)=16$

Output activation map:

$$\begin{bmatrix} 16 & 9 & -4 & -18 \\ 17 & -5 & -10 & -12 \\ 11 & -9 & -17 & 2 \\ 9 & -1 & -15 & 16 \end{bmatrix}$$

3.3) $\max\begin{bmatrix} 16 & 9 \\ 17 & -5 \end{bmatrix}=17$, $\max\begin{bmatrix} -4 & -18 \\ -10 & -12 \end{bmatrix}=-4$

$\max\begin{bmatrix} 11 & -9 \\ 9 & -1 \end{bmatrix}=11$, $\max\begin{bmatrix} -17 & 2 \\ -15 & 16 \end{bmatrix}=16$

max pool result: $\begin{bmatrix} 17 & -4 \\ 11 & 16 \end{bmatrix}$