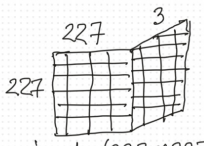
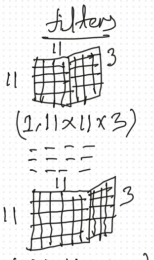
(Alexnet)

1st convulation layers → 227×227×3 = input
filters = 96, stride = 4
Kernal size = 11×11×3



Apply 96 filter of (11×11×3)



input = (227×227×3)

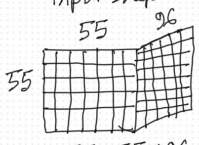
$$\text{Response } R_1 = \frac{\text{input} - \text{Kernel} + 1}{\text{Stride}}$$

$$= \frac{227 - 11 + 1}{4} = 55$$

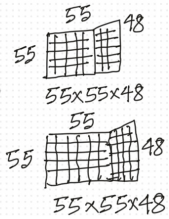
$R_1 = (55 \times 55 \times 96)$

Next,

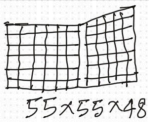
input shape = 55×55×96



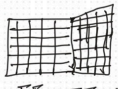
Divided into two gpu →



Now apply max pooling of (3,3) stride = 2



Apply max pooling (3,3) stride = 2 $\frac{55-3+1}{2} = 27 \times 27 \times 48$



Apply max pooling (3,3) S = 2 $\frac{55-3+1}{2} = 27 \times 27 \times 48$

$R_2 = 27 \times 27 \times 48,\ 27 \times 27 \times 48$

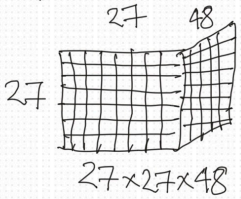
2nd convulation apply,

Input shape (27×27×48, 27×27×48)

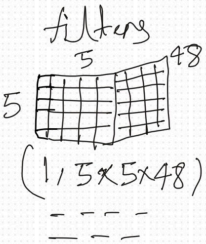
Number of filter 256, 128 for each

Stride = 1, padding = 2

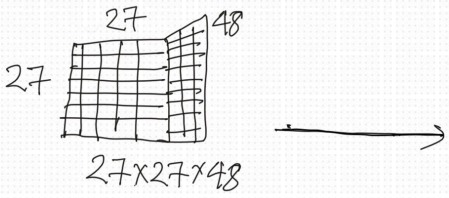
gpu1 Kernal size = (5×5×48)

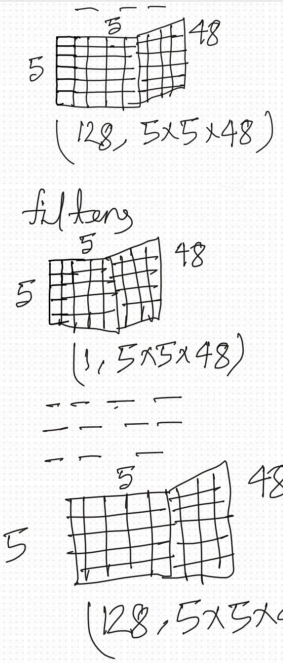


Apply Kernal →



gpu-2





formula with padding

$$\frac{\text{input} + 2\times\text{padding size} - \text{Kernel size} + 1}{\text{Stride}}$$

Now,

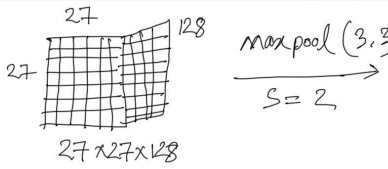
$$R_3 = \frac{27 + 2*2 - 5 + 1}{1}$$

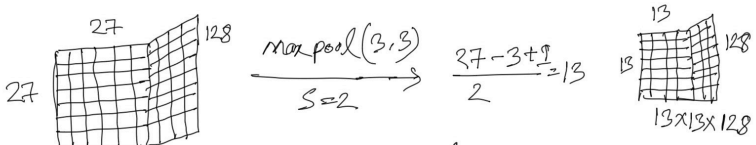
$$= 27$$

So, $R_3 = 27 \times 27 \times 256$

$$= (27 \times 27 \times 128,\ 27 \times 27 \times 128)$$

Now apply max pooling (3,3) with stride = 2





$R_4 = (13 \times 13 \times 128,\ 13 \times 13 \times 128)$

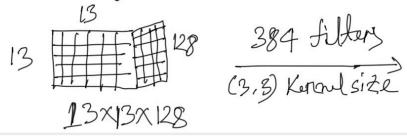
3rd convulation apply, $R_4 = (13 \times 13 \times 256)$

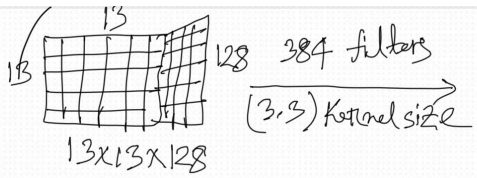
input shape = $(13 \times 13 \times 128,\ 13 \times 13 \times 128)$

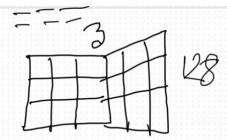
No. of filters = 384

Kernel size = $(3 \times 3 \times 128,\ 3 \times 3 \times 128)$

padding = 1, stride = 1,







(384, 3x3x128)

$$R_5 = \frac{13+2*1-3+1}{1}, \frac{13+2*1-3+1}{1}$$

$$R_5 = (13x13x192, 13x13x192)$$

$$R_5 = (13 \times 13 \times 384)$$

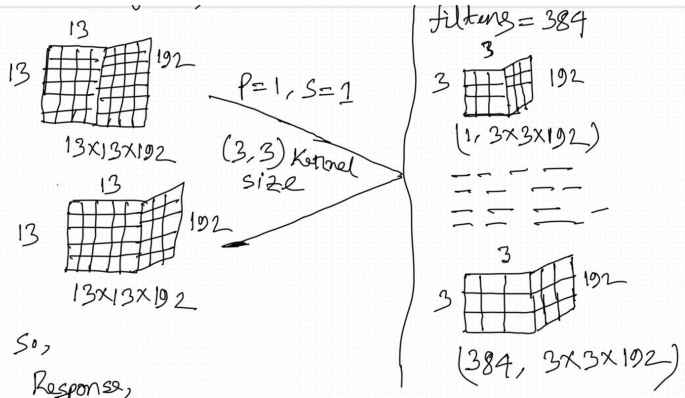
4th convulation apply

Input shape = (13x13x192, 13x13x192)

No. of filters = 384

Kernel size = (3x3x192, 3x3x192)

Padding = 1 Stride = 1



So,

Response,

$$R_6 = \frac{13+2*1-3+1}{1}, \frac{13+2*1-3+1}{1}$$

$$\therefore R_6 = 13x13x192, \quad 13x13x192$$

$$R_6 = (13 \times 13 \times 384)$$

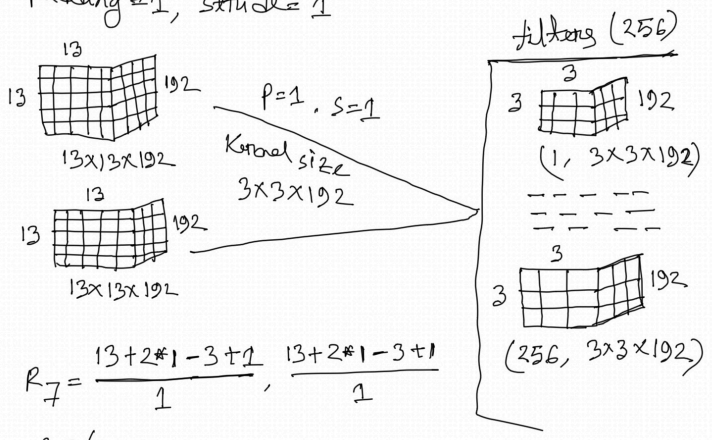
5th convulation apply

Input shape = (13x13x192, 13x13x192)

No. of filters = 256

Kernel size = (3×3×192, 3×3×192)

padding = 1, stride = 1

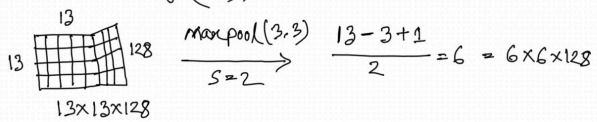


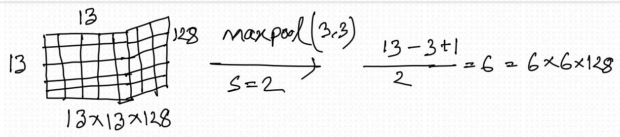
$R_7 = \frac{13+2*1-3+1}{1}, \frac{13+2*1-3+1}{1}$

$R_7 = (13 \times 13 \times 128, 13 \times 13 \times 128)$

$R_7 = (13 \times 13 \times 256)$

Apply max pooling (3, 3), stride = 2





$R_8 = (6 \times 6 \times 128, 6 \times 6 \times 128)$

$R_8 = (6 \times 6 \times 256)$