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Date: Sec 02

Question 02

Shared concept of CNN:

CNN have a couple of concepts called parameter sharing and local connectivity. Parameter sharing is sharing of weights by all neurons in a particular feature map. To reiterate parameter sharing occures when a feature map is generated from the result of convolution between a filter and input data from a unit within this layer plane share same weights, hence its called weight parameter sharing. So, this is the shared concept of CNN

Convolution network to detect vertical boundaries is an image (6x6) with 2 convolution filters for rst layer. of size 3x3 :-

$W_1 =$

-1	0	1
-1	0	1
-1	0	1

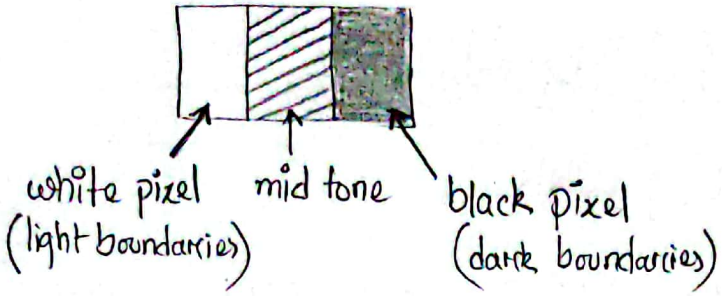
$W_2 =$

1	0	-1
1	0	-1
1	0	-1

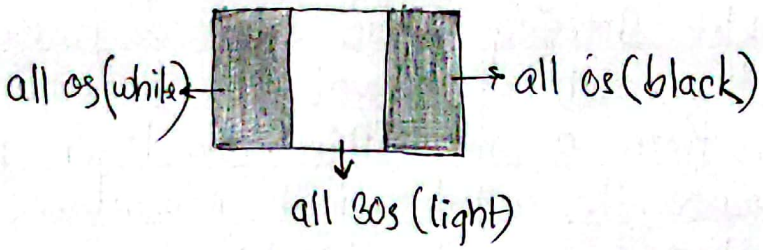
① This is simplified 6x6 image with left half of image is 10 & right half is 0, We can look at it like this,

The tens gives us white pixel intensity (light boundaries) & ones gives us black pixel intensity (dark boundaries)

(ii) When convole with 3x3 filter, fiter can be visualized like-



(iii) for filter 1 :



from 4x4 we get all black boundaries at corner of image since all zeroes on the right and left & all 30s in middle

The filter 2 would give black/white boundaries,