Homework 8

Q1. Compute the output of following input when convolved with the following filter. Assume valid padding.

23	145	1
34	132	10
76	145	32

Input's Channel-1

11	221	12
13	190	65
45	196	56

Input's Channel-2

34	154	75
85	190	89
56	178	90

Input's Channel-3

-1	1

Filter's Channel-1

-1	0

Filter's Channel-2

0	1

Filter's Channel-3

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Q2. Calculate the output probabilities if following are passed to the softmax layer

$$\begin{bmatrix} 8 \\ 5 \\ 0 \end{bmatrix}$$

Now, compute the categorical entropy loss if the target vector is the following:

[1 0 0]

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Q3. Calculate the outputs of two output neurons with the following inputs (x), weight vectors (w) and bias wights (b). Assume sigmoid activation.

Neuron 1	Neuron 2
x=[1,8,-6,-2]	x=[11,81,-16,-21]
w=[1.8,0.1,2.7,3.5]	w=[7.8,0.1,3.7,3.8]
b=2.3	b=2.5

Now, compute the Binary cross-entropy loss if the target vector is [1 1].