Congratulations! You passed!

Grade received 80% **Latest Submission Grade** 80% **To pass** 80% or higher

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1. You are building a 3-class object classification and localization algorithm. The classes are: pedestrian (c=1), car (c=2), motorcycle (c=3). What should y be for the image below? Remember that "?" means "don't care", which means that the neural network loss function won't care what the neural network gives for that component of the output. Recall $y = [p_c, b_x, b_y, b_h, b_w, c_1, c_2, c_3]$.

1 / 1 point

https://www.pexels.com/es-es/foto/fotografia-de-motocicleta-clasica-en-carretera-995487/

- (selected) $y = [1, 0.22, 0.5, 0.2, 0.3, 0, 0, 1]$
- $y = [1, 0.22, 0.5, 0.2, 0.3, 1, 1, 1]$
- $y = [1, 0.22, 0.5, 0.2, 0.3, ?, ?, 1]$
- $y = [1, 0.22, 0.5, 0.2, 0.3, 0, 0, 0]$

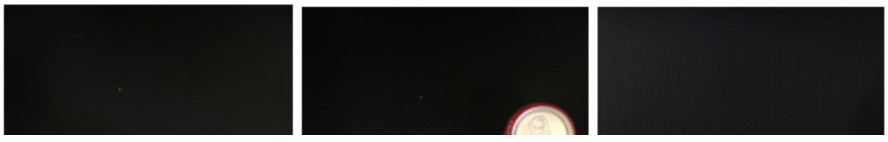
Expand

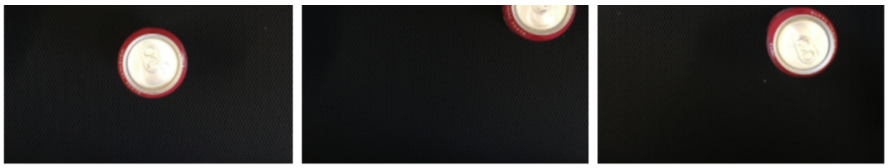
Correct

Correct. $p_c = 1$ since there is a motorcycle in the picture. We can also see that b_x, b_y as percentages of the image are adequate. They look approximately correct as well as b_h, b_w, and the value of $c_3 = 1$ for the motorcycle.

2. You are working on a factory automation task. Your system will see a can of soft-drink coming down a conveyor belt, and you want it to take a picture and decide whether (i) there is a soft-drink can in the image, and if so (ii) its bounding box. Since the soft-drink can is round, the bounding box is always square, and the soft-drink can always appear the same size in the image. There is at most one soft-drink can in each image. Here are some typical images in your training set:

1 / 1 point





The most adequate output for a network to do the required task is $y = [p_c, b_x, b_y, b_h, b_w, c_1]$. (Which of the following do you agree with the most?)

- ○ True, since this is a localization problem.
- ○ False, since we only need two values c_1 for no soft-drink can and c_2 for soft-drink can.
- ◉ False, we don't need b_h, b_w since the cans are all the same size.
- ○ True, p_c indicates the presence of an object of interest, b_x, b_y, b_h, b_w indicate the position of the object and its bounding box, and c_1 indicates the probability of there being a can of soft-drink.

Expand

✓ **Correct**
Correct. With the position b_x, b_y we can completely characterize the position of the object if it is present. We should use only one additional logistic unit to indicate if the object is present or not.

3. When building a neural network that inputs a picture of a person's face and outputs N landmarks on the face (assume that the input image contains exactly one face), we need two coordinates for each landmark, thus we need 2N output units. True/False? **1 / 1 point**

- ◉ True
- ○ False

Expand

✓ **Correct**
Correct. Recall that each landmark is a specific position in the face's image, thus we need to specify two coordinates for each landmark.

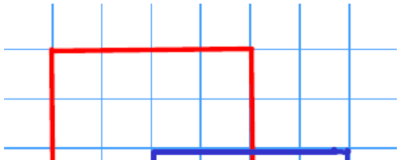
4. When training one of the object detection systems described in the lectures, each image must have zero or exactly one bounding box. True/False? **1 / 1 point**

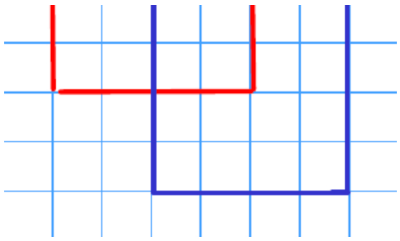
- ○ True
- ◉ False

Expand

✓ **Correct**
Correct. In a single image, there might be more than only one instance of the object we are trying to localize, so it must have several bounding boxes.

5. What is the IoU between the red box and the blue box in the following figure? Assume that all the squares have the same measurements. **1 / 1 point**





- ◉ $\frac{1}{7}$
- ○ $\frac{1}{4}$
- ○ $\frac{1}{8}$
- ○ 1

Expand

Correct
Correct. IoU is calculated as the quotient of the area of the intersection (4) over the area of the union (28).

6. Suppose you run non-max suppression on the predicted boxes nelow. The parameters you use for non-max suppression are that boxes with probability ≤ 0.7 are discarded, and the IoU threshold for deciding if two boxes overlap is 0.5. **1 / 1 point**

After non-max suppression, only three boxes remain. True/False?

- ○ False
- ◉ True

Expand

Correct
Correct. After eliminating the boxes with a score less than 0.7 only three boxes remain, and they don't intersect. Thus three boxes are left.

7. If we use anchor boxes in YOLO we no longer need the coordinates of the bounding box b_x, b_y, b_h, b_w since they are given by the cell position of the grid and the anchor box selection. True/False? **0 / 1 point**

- ○ False
- ◉ True

Expand

Incorrect
We use the grid and anchor boxes to improve the capabilities of the algorithm to localize and detect objects, for example, two different objects that intersect, but we still use the bounding box coordinates.

8. We are trying to build a system that assigns a value of 1 to each pixel that is part of a tumor from a medical image taken from a patient. **1 / 1 point**

This is a problem of localization? True/False

- (•) False
- ( ) True

Expand

Correct
Correct. This is a problem of semantic segmentation since we need to classify each pixel from the image.

9. Using the concept of Transpose Convolution, fill in the values of **X**, **Y** and **Z** below. **1 / 1 point**

(*padding = 1, stride = 2*)

Input: 2x2

1	2
3	4

Filter: 3x3

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

Result: 6x6

	0	0	0	X	
	Y	4	2	2	
	0	0	0	0	
	-3	Z	-4	-4	

- ( ) X = 0, Y =-1, Z = -7

- X = 0, Y = -1, Z = -4
- X = 0, Y = 2, Z = -1
- X = 0, Y = 2, Z = -7

Expand

Correct
Correct.

10. Suppose your input to a U-Net architecture is h x w x 3, where 3 denotes your number of channels (RGB). What will be the dimension of your output ? **0 / 1 point**

- h x w x n, where n = number of input channels
- h x w x n, where n = number of filters used in the algorithm
- h x w x n, where n = number of output classes
- h x w x n, where n = number of of output channels

Expand

Incorrect
To revise, watch the lecture .