

✔ Congratulations! You passed!

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1. Achieving smooth category boundaries is a major difficulty to take into account while designing semantic segmentation models. Which of the following statements describe the origins of this problem? (Check all that apply.)

1 / 1 point

☒ The similarity in appearance between some categories such as road, curb, and sidewalk.

✔ Correct
Correct!

☒ Thin objects such as poles, tree trunks, and lane separators.

✔ Correct
Correct!

☐ Objects within the same category having variable appearances. An example being multiple color and models for cars on the road.
2. When comparing the results of a semantic segmentation model to the ground truth, you found out that for the car category, its **class IOU** is **0.75**. Knowing that the number of false positives (**FP**) is **17**, and the number of false negatives (**FN**) is **3**, what is the number of true positives achieved by this model?

2 / 2 points

60

✔ Correct
Correct!
3. To measure the performance of a semantic segmentation model over all classes, a good idea would be to average the class IOU.

1 / 1 point

☐ True

☒ False

✔ Correct
Correct!
4. Which of the following do you typically see in a Semantic Segmentation Model? (Check all that apply.)

1 / 1 point

☒ Multiple Convolutional layers followed by an up-sampling layer.

✔ Correct
Correct!

☒ Multiple Convolutional layers followed by a Pool layer.

✔ Correct
Correct!

☐ Up-sampling layers in the encoder stage of the architecture.

☒ Up-sampling layers in the decoder stage of the architecture.

✔ Correct
Correct!
5. Anchor boxes are an essential component of any semantic segmentation neural network architecture.

1 / 1 point

☐ True

☒ False

✔ Correct
Correct!
6. In your semantic segmentation model an input feature map is passed through a nearest neighbor up-sampling layer. The output feature map's depth is equal to that of the input feature map.

1 / 1 point

☒ True

☐ False

✔ Correct
7. A standard semantic segmentation architecture that uses a softmax output layer is allowed to associate multiple categories to a single pixel in the input image.

1 / 1 point

☐ True

☒ False

✔ Correct
Correct!
8. Which of the bellow loss functions is usually used to train semantic segmentation models?

1 / 1 point

☐ Mean Square Error (L2-Loss)

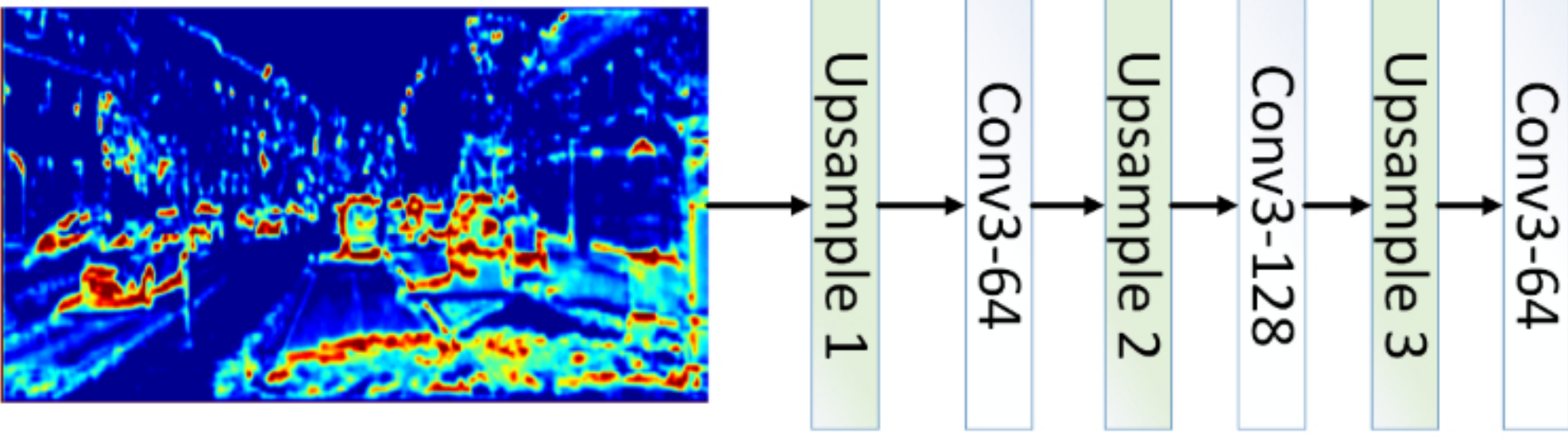
☒ Cross-Entropy Loss

☐ 0-1 Loss

☐ Mean Absolute Error (L1-Loss)

✔ Correct
Correct!
9. A semantic segmentation model uses the following decoder architecture. The convolutions are all 3x3, have a padding size of 1, and have a number of filters shown in the figure. The up-sampling multiplier S is 2 for all upsampling layers.

2 / 2 points



If you pass an input of dimensions $M \times N \times D$ through this decoder, what are the expected output dimensions?

Note: M is the width, N is the height, and D is the depth of the input.

☒ $8 \times M, 8 \times N, 64 \times D$

☐ $8 \times M, 8 \times N, 128 \times D$

☐ $6 \times M, 6 \times N, 64 \times D$

☐ $M/8, N/8, 64 \times D$

✔ Correct
Correct!

10. In context of self-driving cars, semantic segmentation can be used to perform: (Check all that apply.)

1 / 1 point

☐ Localization in a predefined 3D map.

☐ Velocity estimation of dynamic obstacles in the scene.

☒ Lane boundary estimation.

✔ Correct
Correct!

☒ Drivable space estimation.

✔ Correct
Correct!

☒ Constrain the image space used to perform 2D object detection.

✔ Correct
Correct!

11. Which of the following categories in a semantic segmentation output map would be useful to determine lane boundaries?

1 / 1 point

☒ Lane Separator

✔ Correct
Correct!

☐ Road

☐ Pedestrian

☒ Sidewalk

✔ Correct
Correct!

☒ Curb

✔ Correct
Correct!

12. To estimate a plane model, an algorithm would require a minimum of:

1 / 1 point

☐ Five points, chosen at random.

☒ Three points, chosen to be non-collinear.

☐ Three points, chosen to be collinear.

☐ Five points, chosen to be non-collinear.

✔ Correct

13. To estimate lines that could belong to lanes in a post-processed output image from semantic segmentation, containing only relevant categories, one would:

1 / 1 point

☒ First apply Canny edge detection followed by Hough transform line estimation.

☐ First apply Canny edge detection followed by a Kalman Filter to estimate lines.

☐ Use RANSAC to estimate the road plane, then fit lines to its boundary.

☐ First apply Hough transform line estimation followed by Canny edge detection.

✔ Correct
Correct!