✓ **Congratulations! You passed!**
TO PASS 80% or higher

PRACTICE QUIZ

[Keep Learning]

GRADE
100%

Week 3 Quiz: Segmentation on medical images

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TOTAL POINTS 9

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1. Which of the following is a segmentation task?   **1 / 1 point**   Try again

   ✓ Submit your assignment

   ○ None of the above

   ✓ Receive grade
   TO PASS 80% or higher

   ○ Determining whether there is a mass in a chest X-ray

   Grade
   100%

   [View Feedback]

   ◉ Determining which areas of the brain have tumor from an MRI

   We keep your highest score

   ○ Determining whether a brain tumor is present in an MRI

   👍 👎 🚩

   ✓ **Correct**
   Classification tasks have binary or categorical labels for each image, while segmentation tasks ask you to determine a label for every pixel (or voxel).

2. What is the MAIN disadvantage of processing each MRI slice independently using a 2D segmentation model (as mentioned in the lecture)?   **1 / 1 point**

   Hint: watch the lecture video "Segmentation" to help you answer this question.

   ○ None of the above

   ○ 3D models are always better than 2D models

   ○ It is difficult to register slices of MRI models

   ◉ You lose some context between slices

   ✓ **Correct**
   The main disadvantage is the loss of information between slices. For example, if a tumor is present in a given slice, then we would expect higher probability of having a tumor in the same area in neighboring slices.

3. The U-net consists of...   **1 / 1 point**

   ○ Just a contracting path

   ○ An expanding path followed by a contracting path

   ○ Just an expanding path

   ◉ A contracting path followed by an expanding path

   ✓ **Correct**
   The U-net consists of a contracting path followed by an expanding path. This can be interpreted as 'squeezing the input to create a low dimensional representation and then producing a segmentation based off of those low dimensional features.

4. Which of the following data augmentation is most effective for MRI sequences?   **1 / 1 point**

   ◉ Rotation

   ○ Randomly shuffle the pixels in each slice

   ○ Shifting each pixel to the right by a constant amount with wrap around

   ○ Shuffling the slices

   ✓ **Correct**
   The only transformation which preserves the integrity of the data is using rotations. If we shuffle the slices, the relationships between the slices will change and the model will not be able to learn.

5. What is the soft dice loss for the example below?   **1 / 1 point**

$$L(P,G) = 1 - \frac{2\sum_{i=1}^{n} p_i g_i}{\sum_{i=1}^{n} p_i^2 + \sum_{i=1}^{n} g_i^2}$$

P

0.3	0.7	0.3
0.7	0.9	0.7
0.3	0.7	0.3

G

0	1	0
1	1	1
0	1	0