Semantic Segmentation

ASSIGNMENT

1. Describe the reason why mIoU of practical examples 1 and 2 are near/similar, despite the visual results being better in example 2.

2. The dataset of practical examples 1 and 2 have the object's colors fixed: rectangle (red), circle (green), and triangle (blue). Then, modify the dataset creation function and randomize the objects' colors. For example, an object can be created with blue, yellow, white, etc. The unique restriction is not to repeat the object's colors in the image. Finally, retrain the examples and evaluate the results.

3. Implement online data augmentation to practical examples 1 and 2 with the following transformations: To grayscale, random brightness, and random zoom. Remember to reflect the changes in the mask of the input image. Finally, retrain the examples and evaluate the results.

4. Try to improve the results obtained in previous exercises by increasing the number of convolutional layers, downsampling, and upsampling in the encoder-decoder architecture. Then, analyze the results of the changes and write a report with your insights. The report should contain the model's learning curves, image segmentation results, evaluation metrics, and a pixel-level classification confusion matrix.