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Project #3. Encoder-Decoder Implementation

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This report explains the third assignment, Encoder-Decoder architecture with two model : original U-Net and ResNet with Pascal VOC 2012 dataset. In this assignment, I completed the code for 'main_skeleton.py', 'module_skeleton.py', 'Unet_skeleton.py', and 'resnet_encoder_unet_skeleton.py'. In 'main_skeleton.py' code, I implemented for loading, saving, and initializing two models (Unet and ResNet encoder Unet). I also set the optimizer and loss : Adam optimizer and cross Entropy loss. In 'module_skeleton.py' code, it shows fucntions that trains or tests model and checking the accuracy with visualizing RGB image using cls_invert[]. In 'Unet_skeleton.py' code, I implemented UNet architecture as we learned from the lecture. The important part is the skip connection copying feature map which is useful in dealing with multiscale information, so I concatenate in dimension 1. And also for maintaining activation map size, 3 conv layer stride value are set to 1. In 'resnet_encoder_unet_skeleton.py' code, most of the implementation is similar to previous assignment. One distinct point is that the downsampling flag for the last ResidualBlock of layer3 part : It should maintain the spatial resolution so it has to be constrained to be False value. In forward function, I concatenate outs as similar way I previously did in UNet.

The results from two architectures are shown in below images (UNet and UnetWithResnet in sequentially). The UNet showed higher validation accuracy respectively.