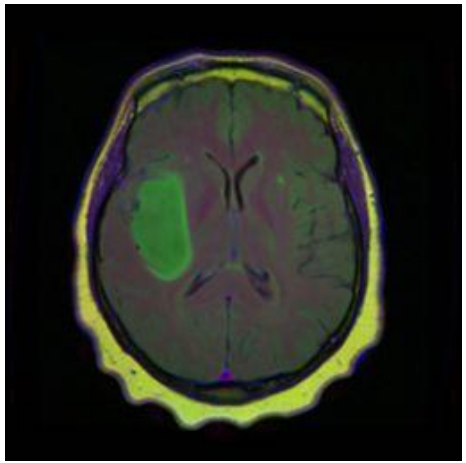
Brain MRI Segmentation

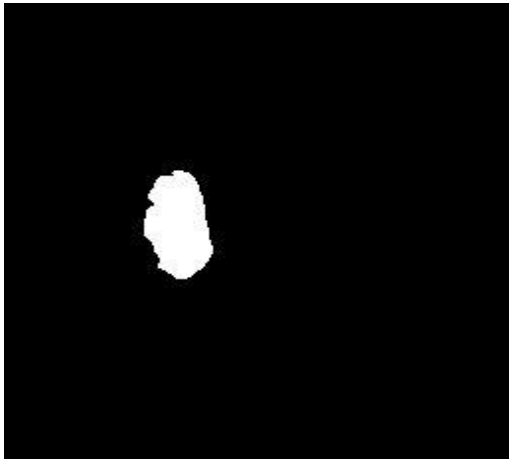
IDA ML 2 Final Project

Problem Settings and dataset

- Dataset is MRI images of patients along with manual FLAIR abnormality segmentation masks.
- We have to build a model that can predict brain Tumor from MRI Images (**Semantic Segmentation**)
- Images size (256,256,3)
- Total images 3929 and we have same number of masks.

MRI with tumor and its Mask





Loss Function and metrics

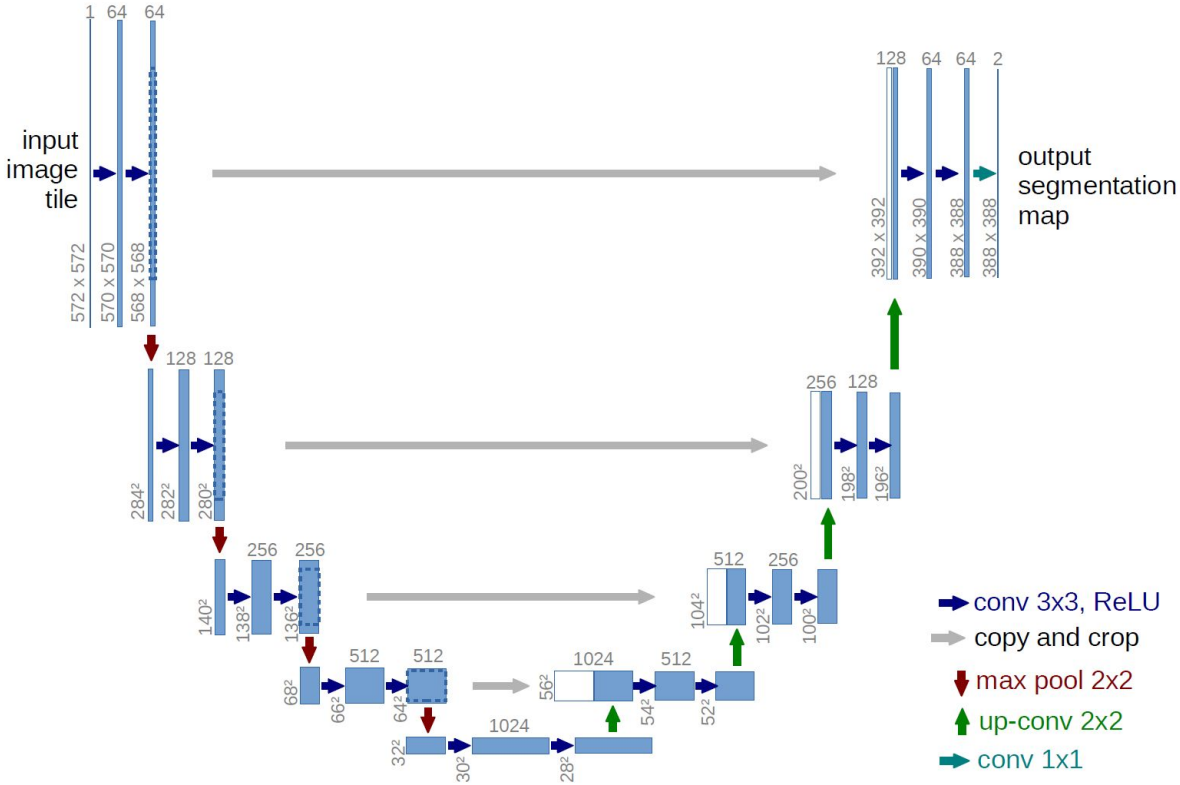
For Model Optimization

BCE Dice Loss = Dice_Coeff_loss + Binary_cross_entropy_loss

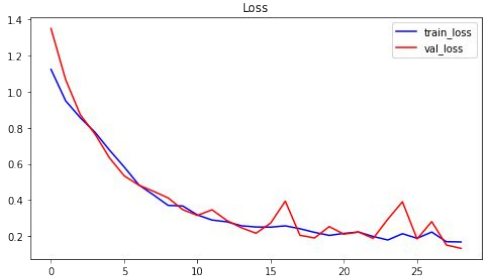
As Metrics

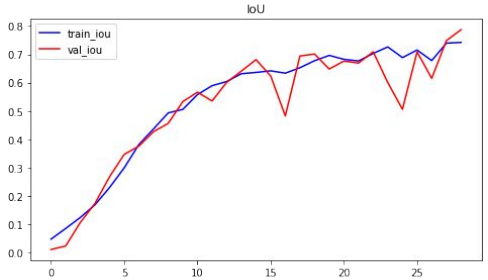
- Dice Coefficients Loss = 2 overlap / total pixels of both
- IOU = Area of overlap / Area of Union

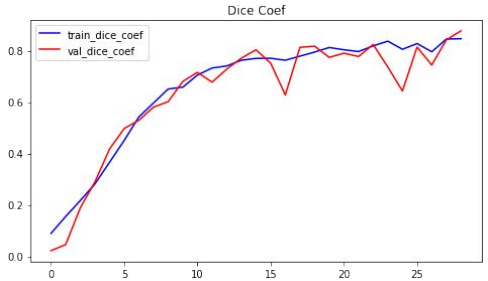
Unet as model Architecture



Training Loss and Metrics







Model Evaluation on Test Set

```
Test IOU:  0.7734204530715942

Test Dice Coefficient:  0.8688165545463562
```

Visualizing Results