1. **Testing:**

Program name:new\_predict.py

- Generate metrics such as Average IOU, F1 score, Accuracy, Precision, Recall.

- Save results images in directory specified.

1. **Training:**

Program name: train.py

- used to train U-Net with backbones such as VGG19, ResNet - 50, ResNet - 101

-Will also generate metrics graphs at end of training, such as training and validation loss, learning rate, training and validation IOU.

1. **Data Cleaning:**

Program name: data\_cleaning.py

Select images and corresponding binary masks such that amount of foreground in binary masks is within certain desired range.

1. **Threshold selection:**

Program name: iou selection.ipynb

Algorithm which finds out for which value of binary threshold value the model gives better IOU with ground truth binary masks.

1. **Data Generator:**

Program name: data.py

Data generator is used to read training and validation of data on fly during training and apply custom designed augmentation pipeline.

1. **Loss functions:**

Program name: project/segmentation\_models/losses.py

Has various loss function defined such as binary\_crossentropy, binary\_focal\_loss, dice\_loss.

1. **Metrics functions:**

Program name: project/segmentation\_models/metrics.py

Has various metric functions defined such as IOU score, F score, Precision, Recall

1. **U Net Model building:**

Program name: project/segmentation\_models/models/unet.py

1. **Various model backbone architectures:**

Program name: project/segmentation\_models/backbones/classification\_models-master/classification\_models-master/classification\_models/models\_factory.py

1. **Model weights, training graphs**

All the model weights and related graphs are stored in folder named “train\_summary”.

1. **Training and testing data set:**

Training images and it’s corresponding binary masks are kept in folder “dataset/train/images\_new\_selected/” and “dataset/train/images\_new\_selected/masks\_new\_selected”.

Testing images and it’s corresponding binary masks are kept in folder

“dataset/test/images\_new\_selected/” and

“dataset/test/masks\_new\_selected/”.

1. **Anaconda environment replication:**

Use the following command in anaconda prompt:

conda env create -f environment.yml

It uses given environment.yml file in project folder to install necessary libraries.