Instructions to run custom Unet Model for Salt Region Identification

1. ## Testing:

Program name: Testing.ipynb

- Generate Average IOU metric.
- Save results images in directory specified.

2. ## Training:

 Program name: Training.ipynb

 - Used to train Custom U-Net model from scratch.
  -Will also generate metrics graphs at end of training, such as training and validation loss, training and validation IOU scores.

3. ## Data Cleaning:

Program name: preprocessing.ipynb

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

4. ## Threshold selection:

Program name: folder1/iou selection.ipynb
Algorithm which finds out for which value of binary threshold value the model gives better IOU with ground truth binary masks.

5. ## Pickle Files:

Program name: preprocessing.ipynb

Pickle library is used to write the image data to a list and store it as files in the disk. Used to read the data on fly during training and apply custom designed models for testing purpose.

6. ## Loss functions:

Program name: folder1/competition_data/segmentation_models/losses.py

Tried different combinations of loss functions and "binary_focal_dice_loss" gave us desired results.

7. **Metrics functions:**

Program name: competition_data/segmentation_models/metrics.py

Evaluated the performance of the model using MeanIOU.

8. **U Net Model building:**

Custom U Net model built from scratch using resnet blocks.

9. **Model weights, training graphs**

All the model weights and related graphs are stored in folder named "competition_data". For loading the model just use myModel.h5 file. Model architecture is save in png file as model.png

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

Training images and its corresponding binary masks are kept in folder "folder1/dataset/train/images_new_selected/" and "folder1/dataset/train/images_new_selected/masks_new_selected".

Testing images and it's corresponding binary masks are kept in folder "folder1/dataset/test/images_new_selected/" and "folder1/dataset/test/masks_new_selected/".

11. **Anaconda environment replication:**

Use the following command in anaconda prompt:
conda env create -f new_environment.yml

It uses given new_environment.yml file in project folder to install necessary libraries. This file is stored in "/folder2/new_environment.yml"