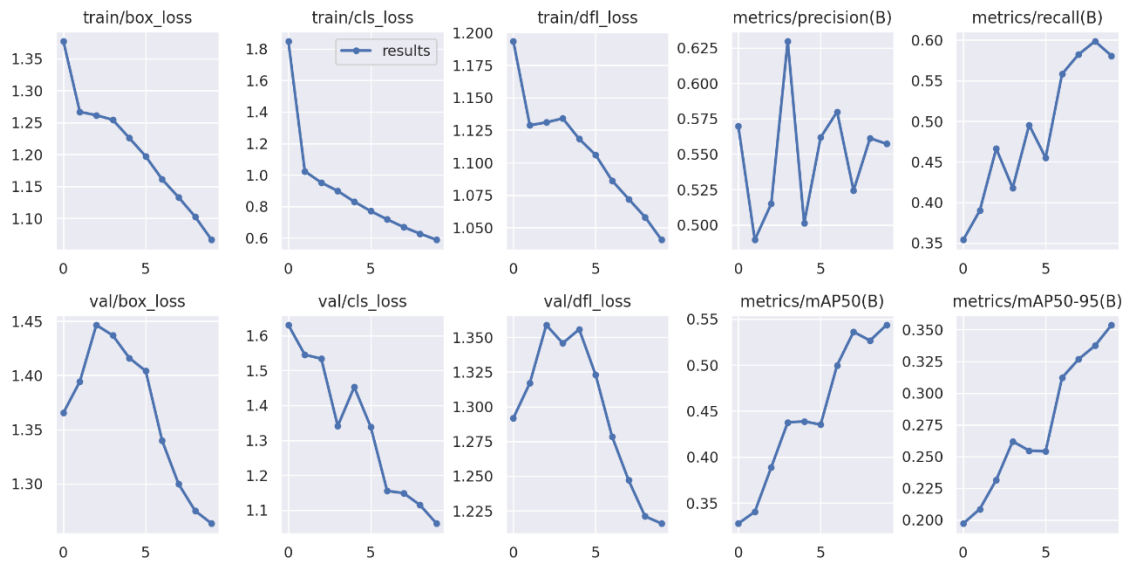# Dataset:

Dataset contains about 4.8k images for training that are augmented to about 9.6k, 1.6k images for validation and about 760 images for testing.
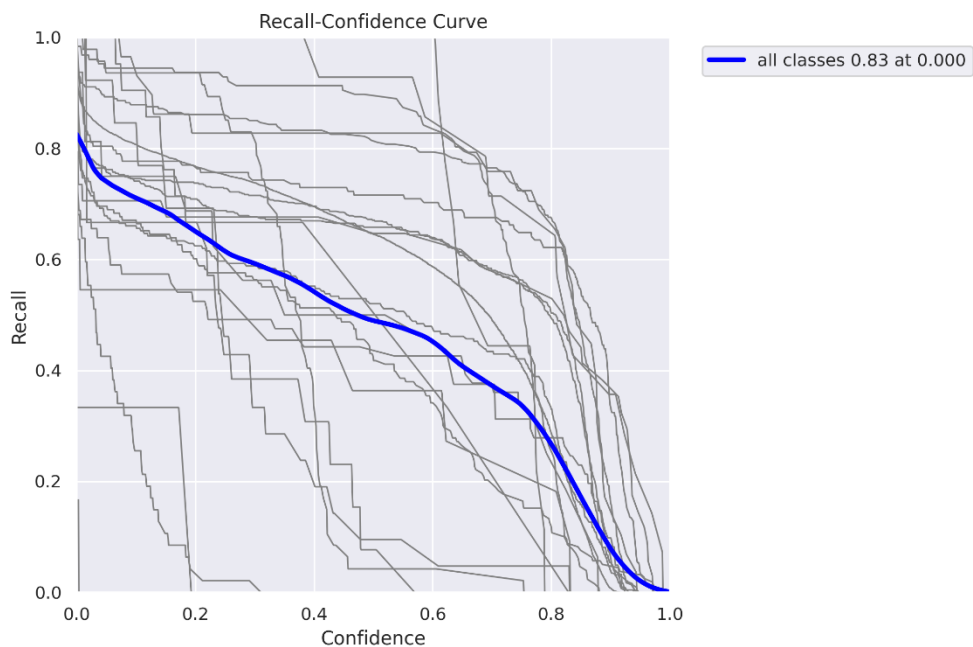
Data augmentation:

I have used 2 different data augmentations and in order to compare here are the results for both of them.
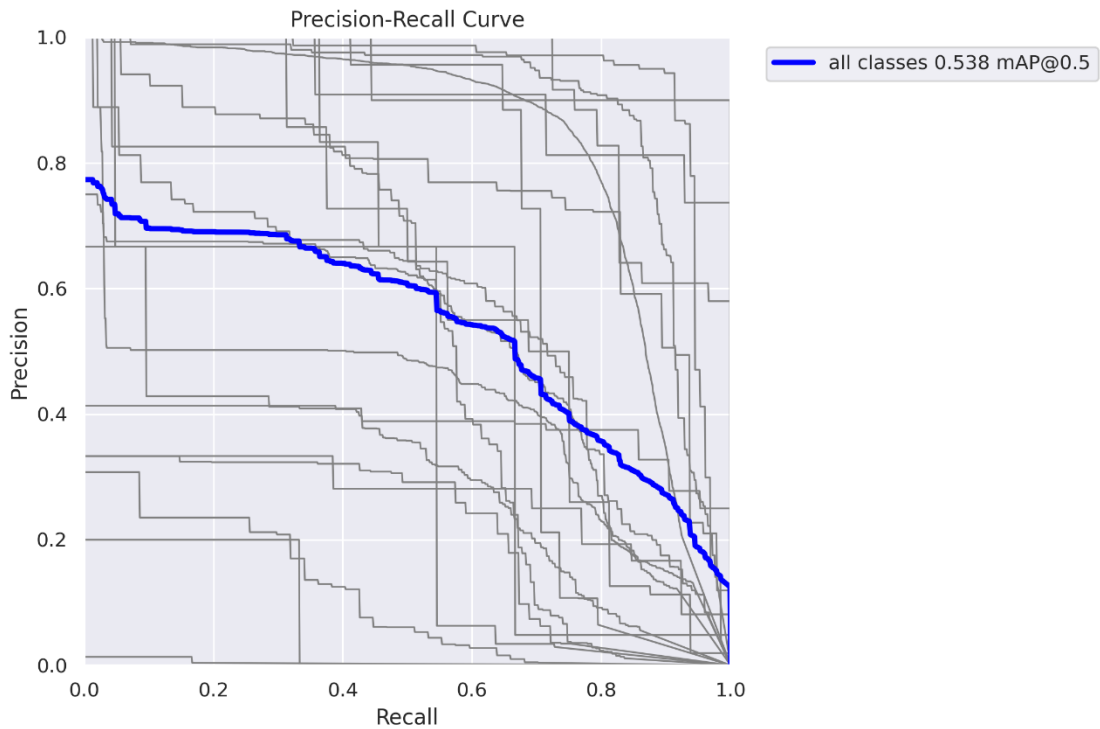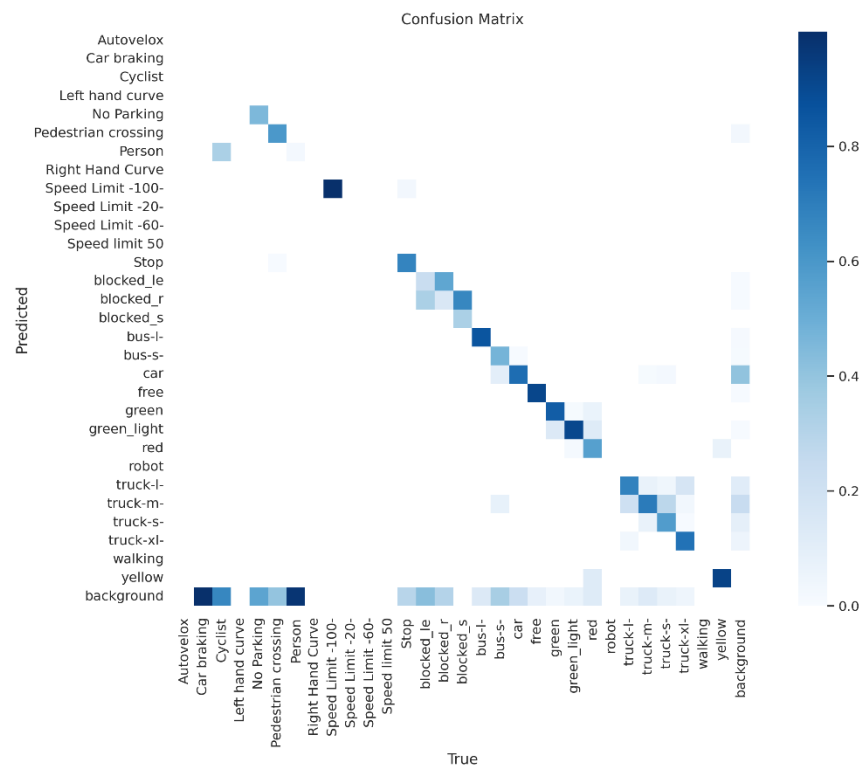
1. **Cutout: 3 boxes with 9% size each**
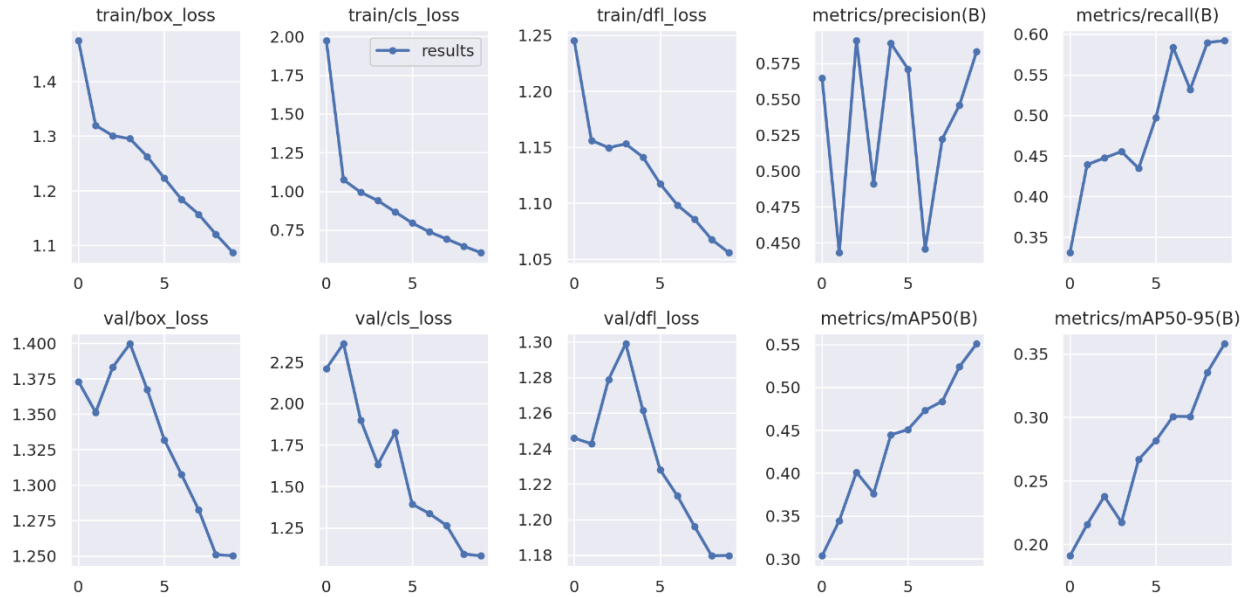   **Result:**

   Recall curve:

Precision Recall curve:

Precision-Recall Curve

all classes 0.538 mAP@0.5

Confidence matrix:

Confusion Matrix

2. Rotation: Between -15° and +15° and Noise: Up to 5% of pixels
Results

Recall curve:

Recall-Confidence Curve

all classes 0.81 at 0.000

Precision Recall curve:

Precision-Confidence Curve

all classes 1.00 at 1.000
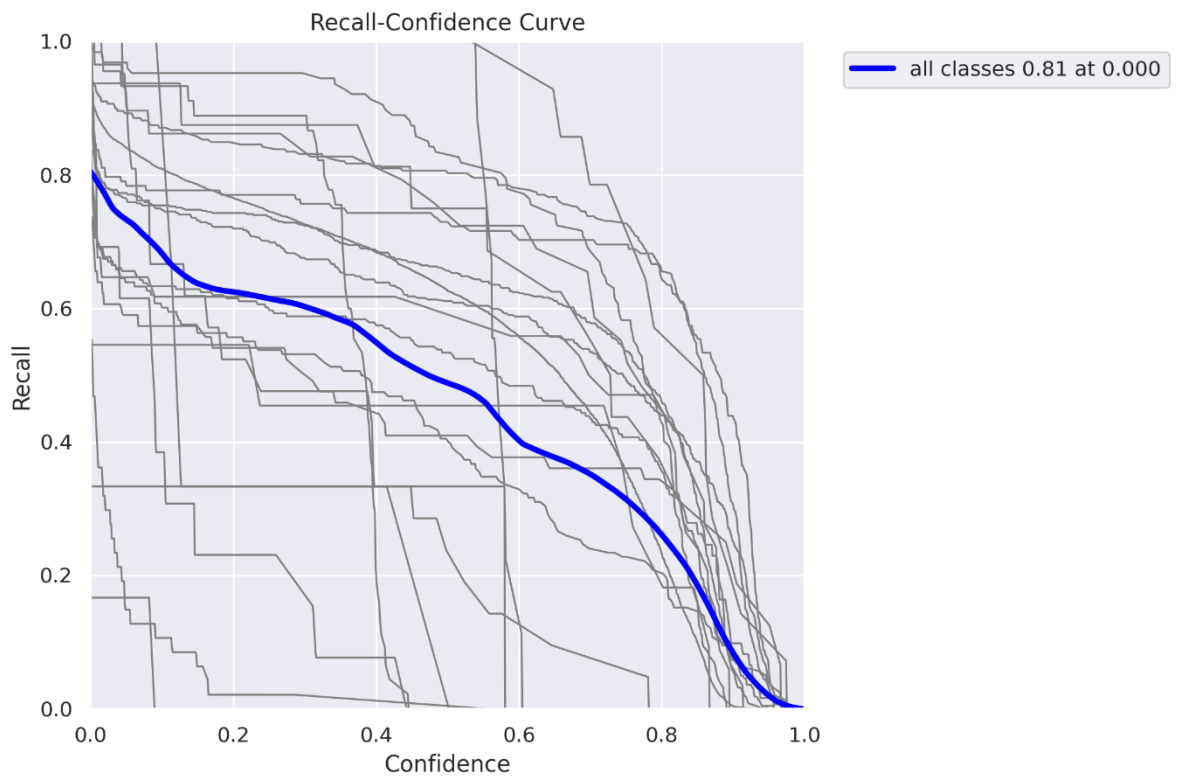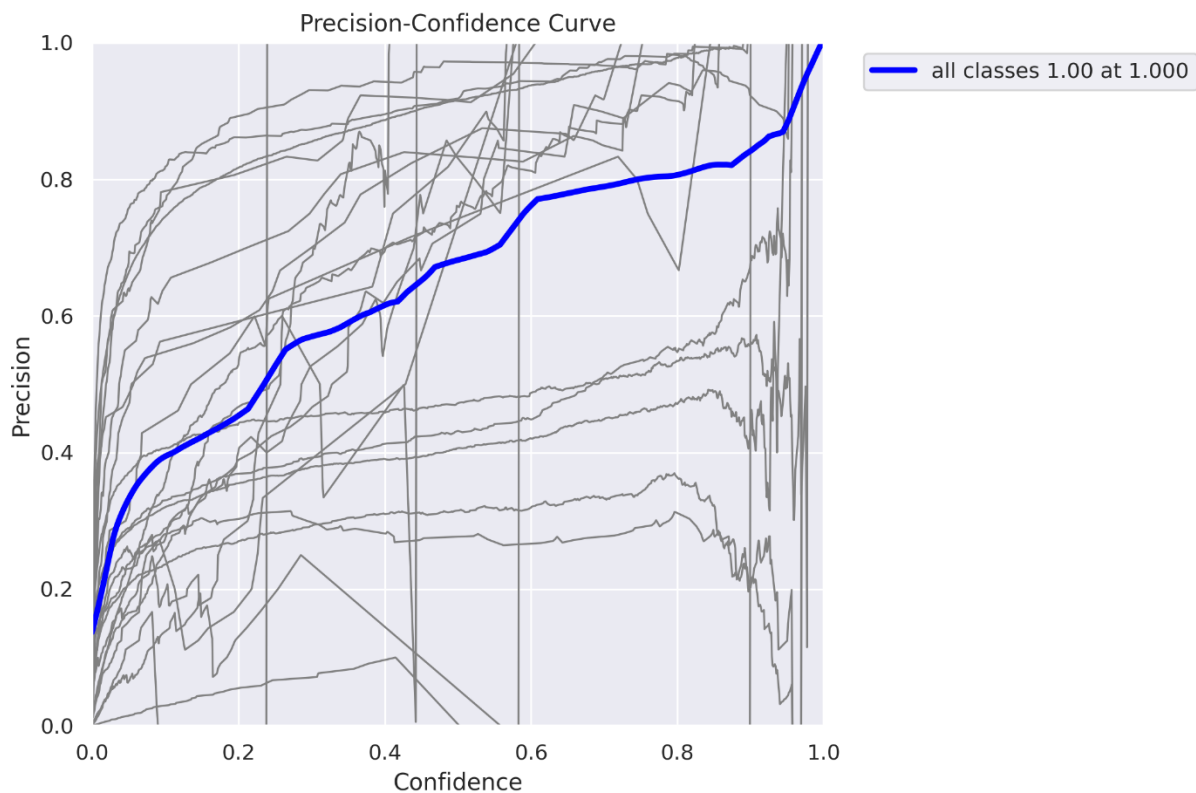
Confidence matrix:

Confusion Matrix
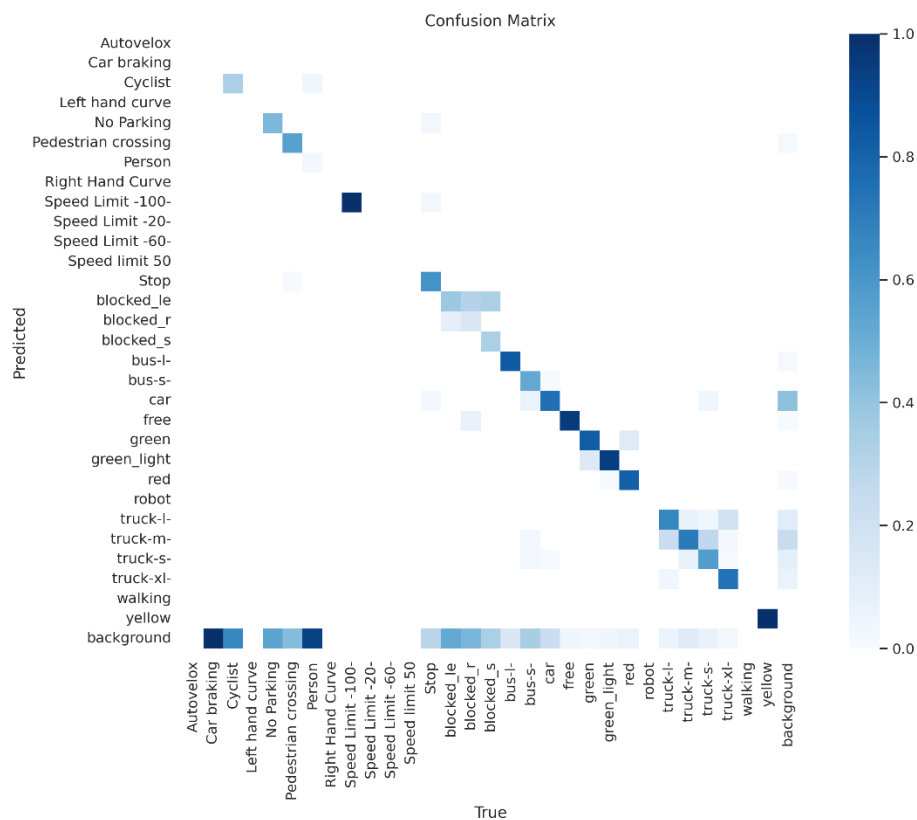
Conclusion:

As we can see in the graph the model with cutout augmentation is providing slightly better results than other one.

Challenges:

- The first challenge that I have faced till now is to collect and prepare data according to the classes and there are about 30 classes in the dataset including lane detection classes.
- Secondly for yolo models we must annotate each class instance in images with proper box and annotation.
- Lack of resources as colab GPU access is limited. So, training takes a lot of time.
- As graphs represent models are making progress and loss is continuously decreasing. It means we can further train the model at least up to 30 epochs again it is a time taking and resource intensive task.
- We can further extend the size of data using augmentation but this will make the model hard to train.