Supervised Learning:

I first instantiated a VGG-19 model with pre-trained weights, froze it (so that its weights are not updated during training) and created a new model on top - 1 fully connected dense layer along with a dropout layer and softmax layer to predict the label.

Trained the model on Kaggle’s TPU

Results: accuracy on test set was 66.56%

Semi-Supervised Learning:

Used pseudo-labelling to improve model accuracy. Approach-

Pseudo-labelled the unlabelled images in batches of 100. Predicted the label of a batch of unlabelled images using the model trained on labelled data and then appended the image and its respective label to the training dataset if the probability of the label being correct was greater than 0.99. Then trained the model again on this augmented training set. Repeated this 4 times for a single batch.

Did not use the entire unlabelled images dataset to restrict training time, only used around 6.5k unlabelled images for pseudolabelling.

Results: accuracy after pseudo-labelling was 70.71%

My thoughts on why there isn’t a significant improvement in accuracy-

In this approach we have only added those images to the training set whose labels could be predicted with a certain confidence (probability > 0.99). The inherent disadvantage to this approach is that we are appending images (to the train set) on which our model did well but we are not improving upon the model’s weak areas. I think we may improve the models accuracy by taking a look at the unlabeled images for which our model could not predict a label with sufficient accuracy and take a look at the images on which our model could not do well.