Report 2

To train a deep model and classify the five different kinds of flowers. I used the CNN model to train the training set, and evaluated this model by validation set, the accuracy is not very high, about 69% to 80%. Here I make a brief introduction on my deep model.

1. Process data
   In order to access the image data efficiently, I convert the image dataset to TFRecords format. Here I write two methods to realize the function of reading and writing TFRecords data, which are kept in 'DataProcess.py'. Besides, in this process, I resize each image to the size of 39*39 for handling them in a convenient way.

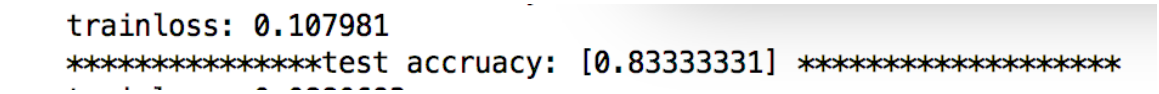
   To avoid dealing with too much data in a long time, I separate the image dataset to many batches after preprocessing the images.

   As for labels, adopting one-hot method to convert the labels to vectors.

2. Train model
   The network structure is:
   Convolutional layer 1: filter size is 4*4, 20 features, VALID padding, ReLU activation and max pooling layer with size equals to 2.
   Convolutional layer 2: filter size is 3*3, 40 features, VALID padding, ReLU activation and max pooling layer with size equals to 2.
   Convolutional layer 3: filter size is 3*3, 60 features, VALID padding, ReLU activation and max pooling layer with size equals to 2.
   Fully connected layer1: 120 units, contains a ReLU activation.
   Fully connected layer2: this is the final layer with 5 units.

   I put the entire network structure into a class, and this network is easy to be called. In addition, in order to run the program faster, I adopt the thread method to run the training process.

3. Accuracy
   At last, I set learning rate as 0.005, and the number of epoch is 160. I run the program on CPU rather than GPU, therefore, the program ran in a long time. And the validation accuracy could reach 83.3%.



   Here the train loss is the loss of validation set, I did not make a test on training data.

4. Challenge and solution
   Because tensorflow has no direct method to predict the test data, thus, I saved the

training model in the file, and restored the model when I needed to make a prediction on test images. It was difficult for me to get the logits layer since I tended to run the prediction process in a new file, and I felt that it was not elegant to copy the whole network to the new file, I tried many methods but failed. And finally, I found that importing the network from the training model file was useful.

5. Confusion
   I am still confused that the accuracy of iterations is not incremental, but fluctuating in a small range.