

## 1. Introduction

In this lab, I need to use ResNet18 and ResNet50 to analyze diabetic retinopathy. There are three works I need to do. First is that I have to write my own custom dataloader. Second, use ResNet18 and ResNet50 to classify. Finally, calculate and plot the confusion matrix to evaluate the performance.

## 2. Experiment setups

### A. The details of your model (ResNet)

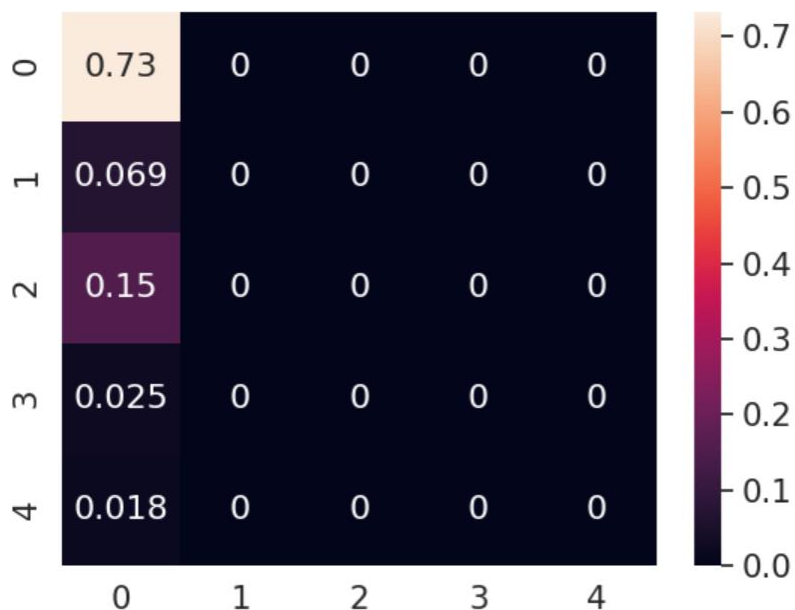
I directly use the module torchvision to build up my ResNet18 and ResNet50. I only reinitialize the last layer (linear), which means modify the dimension of the specific layer.

### B. The details of your DataLoader

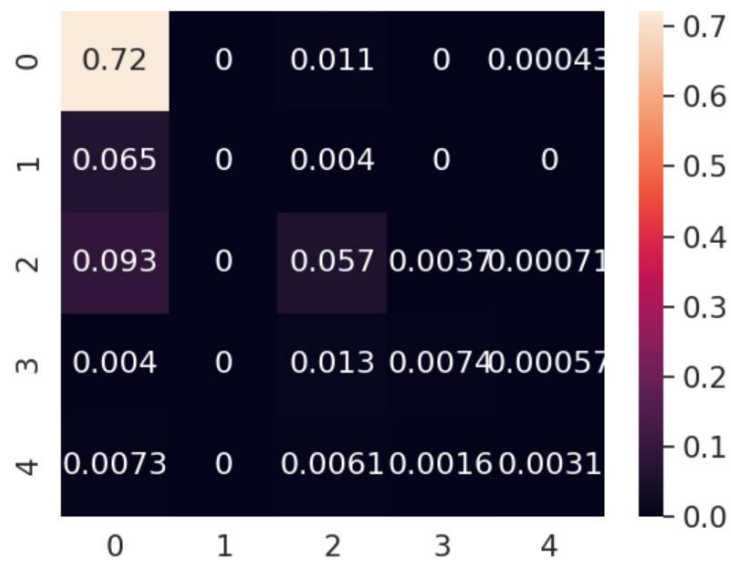
First, I use opencv to help me load the image, and then I normalize the given image by letting the pixel in the image become 0 to 1, also this step is done by the function in opencv. Finally, I reshape the given image from [H, W, C] to [C, H, W].

### C. Describing your evaluation through the confusion matrix

ResNet18 w/o pretraining : The outputs of model are all zero, so I think though it has 73% accuracy, this model is still a bad classifier.



ResNet18 with pretraining



It seems that the model has little ability to learn, it can classify correctly some images which label are not 0.

### 3. Experimental results

#### A. The highest accuracy

##### ■ Screenshot

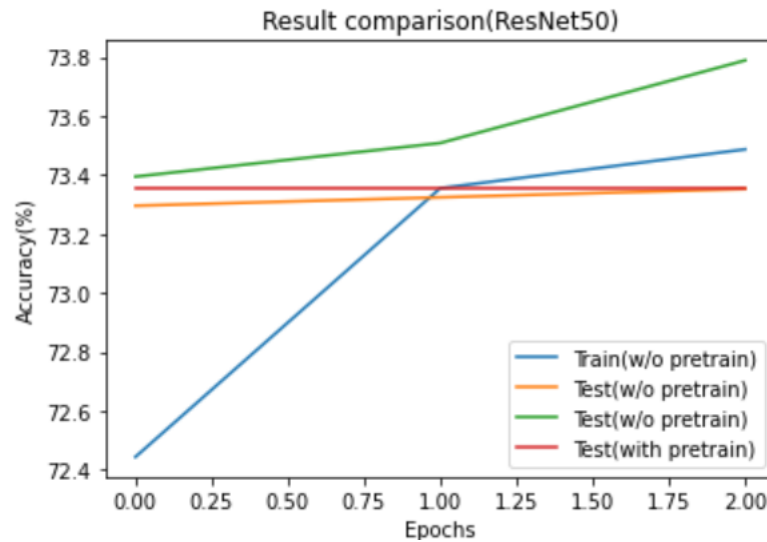
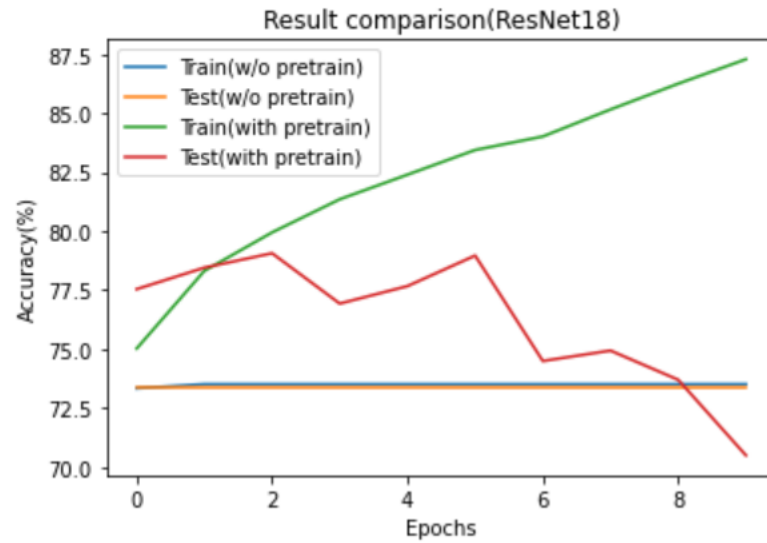
	Without pretrain	With pretrain
ResNet18	73.35%	<b>79.06%</b>
ResNet50	72.59%	73.15%

10 epochs  
3 epochs

##### ■ Anything you want to present

#### B. Comparison figures

##### ■ Plotting the comparison figures (ResNet18/50, with/without pretraining)



Due to the limit of time, I only run 3 epochs for ResNet50.

#### 4. Discussion

- A. I found torchvision.transforms too late so that I don't have time to try it. I think preprocess the image would produce a better performance.
- B. According to my result, the model without pretraining has no ability to learn. The test accuracy remains about 73% although I have trained the model 10 epochs.
- C. I try to use the freezing to my pretrain model, however, the accuracy even becomes worse than the original.