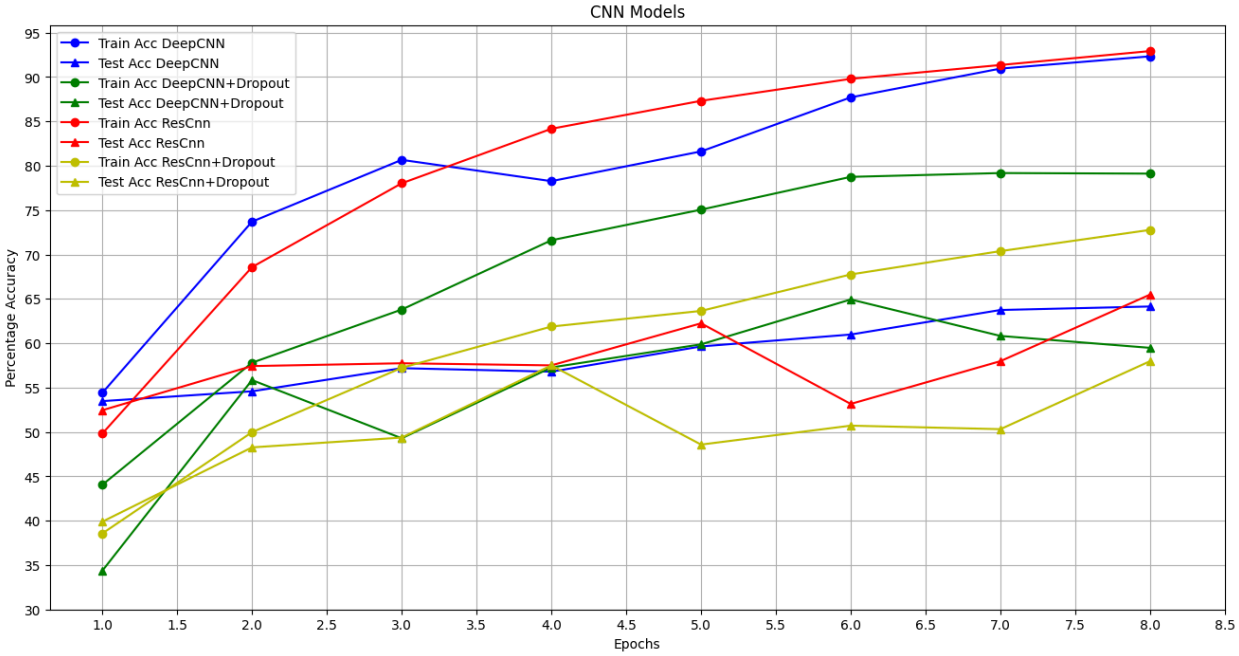
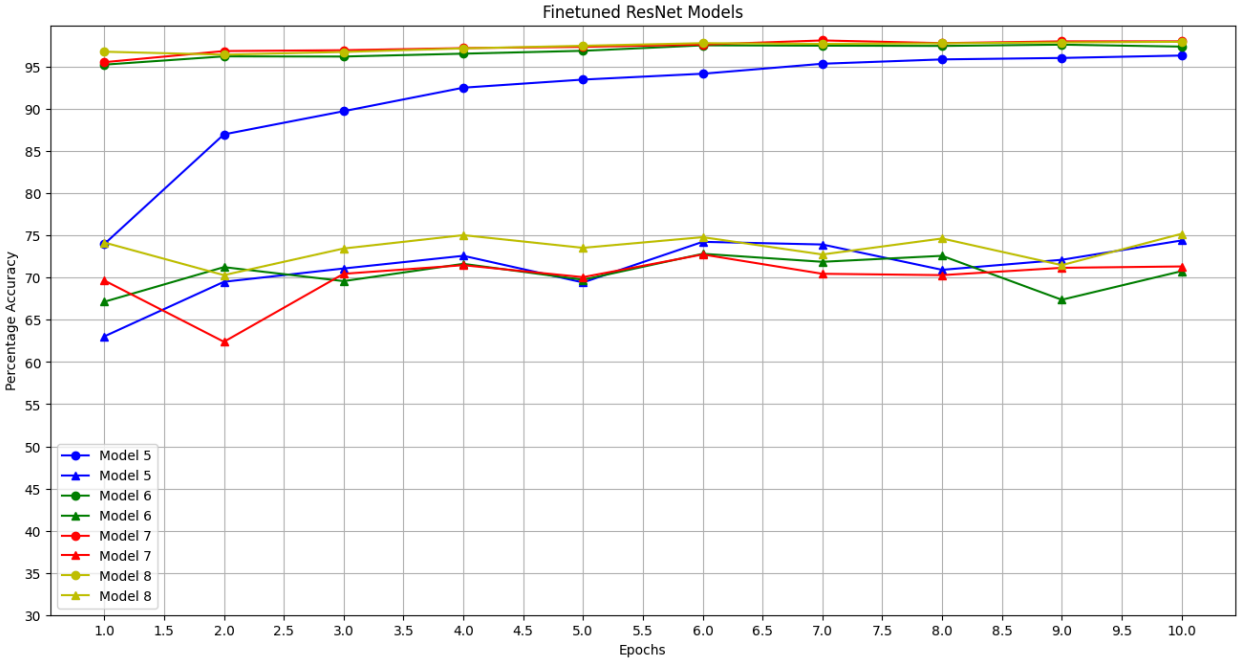
OncoNet WiDS 5.0

CNN vs ResNet Performance for ISIC Data



CNN Models



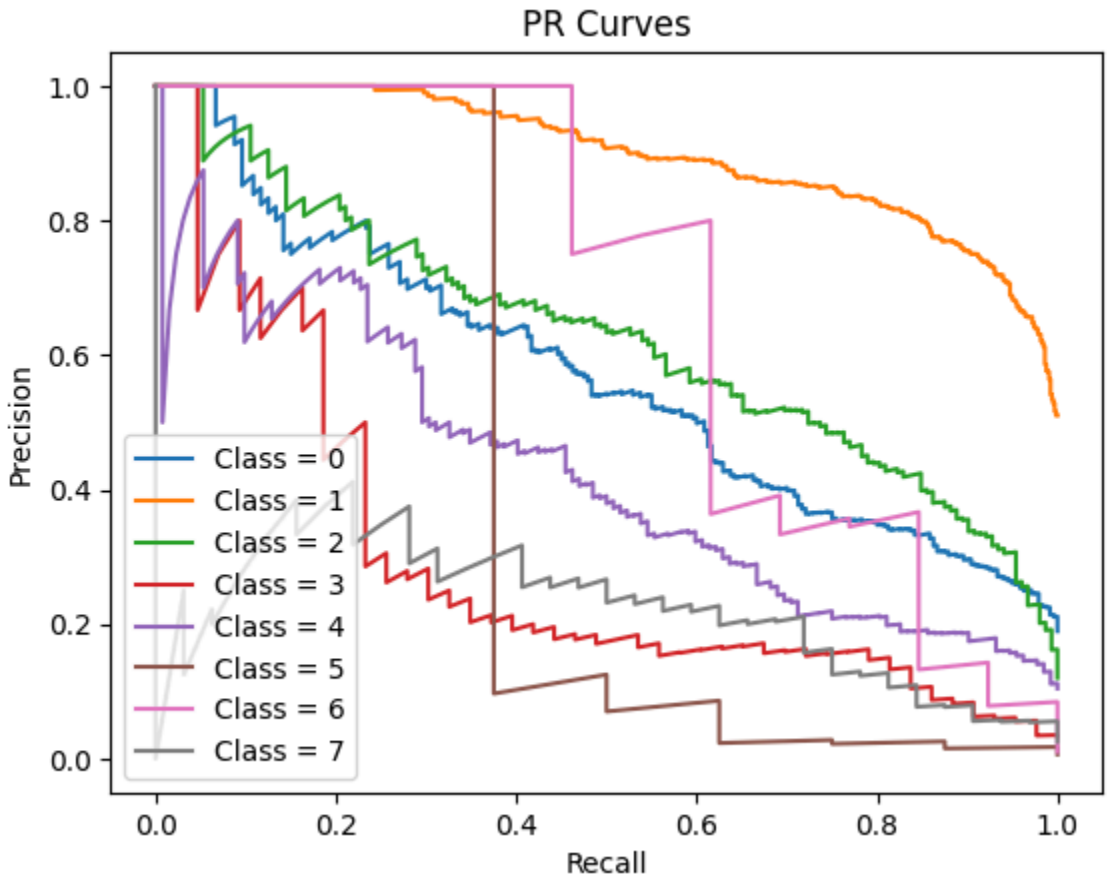
ResNet FineTuned Models

As we can see above, the best pre-trained ResNet18 model (Model 8) achieved 90+% training accuracy in the first epoch itself, while the scratch CNN models could achieve that good training accuracy only after 7-8 epochs

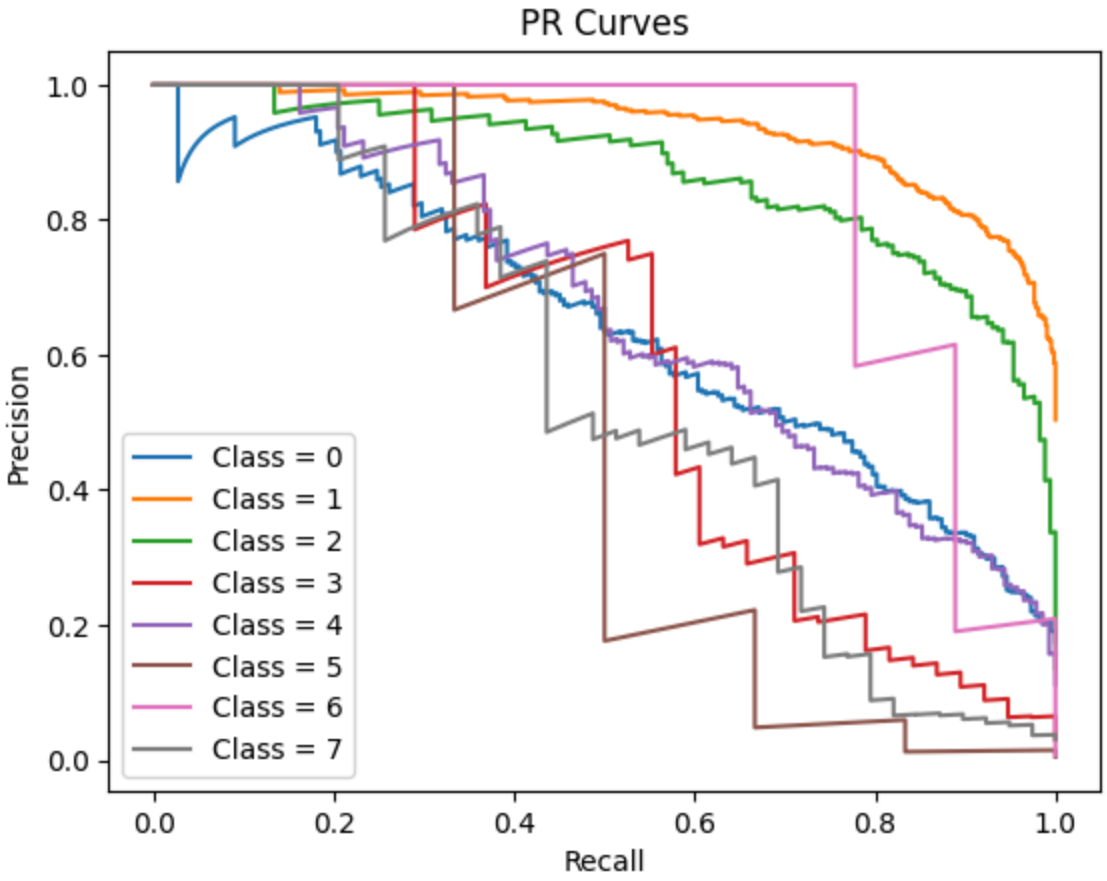
The ResNet18 model being deeper, the finetuned models could capture more features, and hence it resulted in better training and testing accuracy than that of CNN models

The precision, recall, F1 score, and weighted accuracy of model 8 are about 10% better than those of CNN models. Even the PR curves and confusion matrix indicate that Finetuned models could learn better. The precision, recall, and F1 score being close to the raw accuracy indicate that the model could learn properly, even in this case of biased multi-class classification. This is because of the relative proportion of images taken in the training data.

Summary:
Shallow CNN Models reached a peak accuracy of 65% while pre-trained ResNet deep models with fine-tuning achieved a peak accuracy of 76%.



PR Curve for CNN Model



PR curve for fine tuned resnet18 model