ASSIGNMENT 5 – PART: 1

Detecting Coronavirus Infections through Chest X-Ray images

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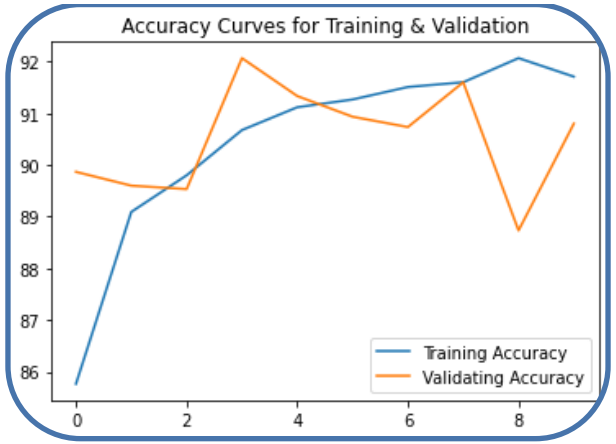
Github Link:

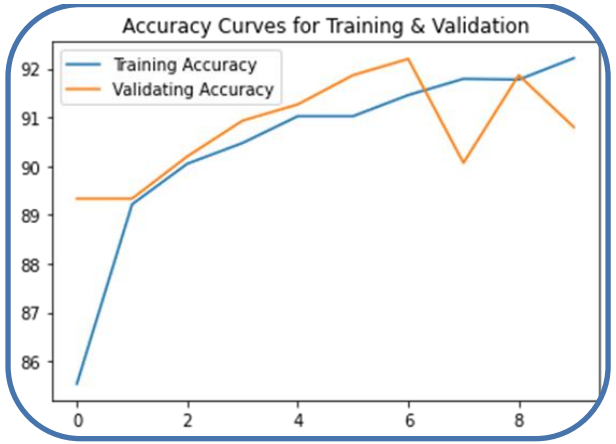
https://github.com/MSDS19026/MSDS19026_COVID19_DLSpring2020

VGG-16

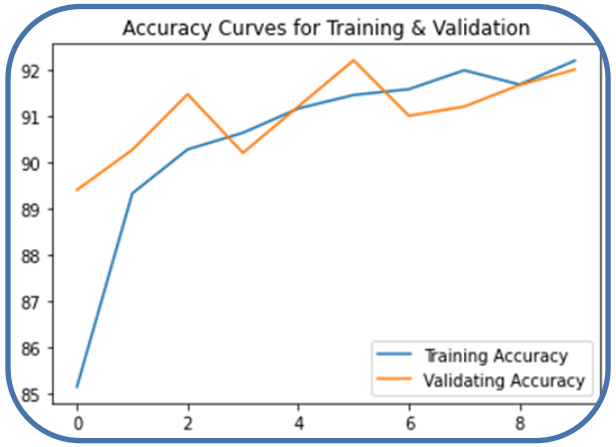
Training & Validation Accuracy



Task-1



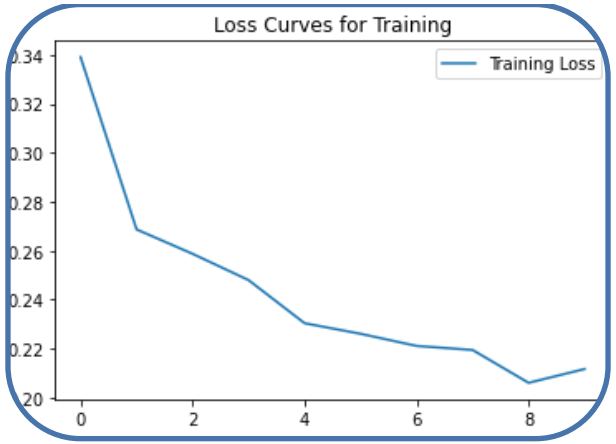
Task-2 (Last layer Unfreeze)



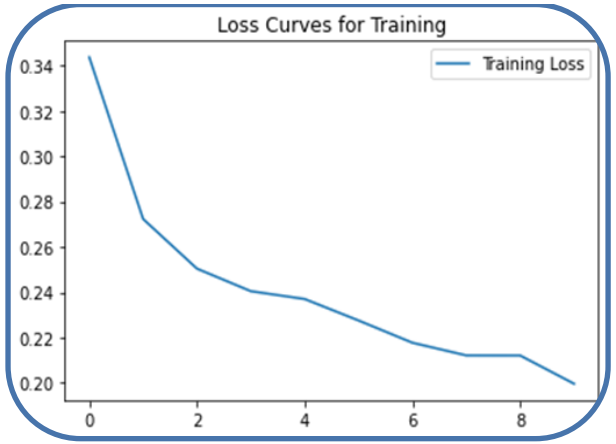
Task-2 All Layers Unfreeze

VGG-16

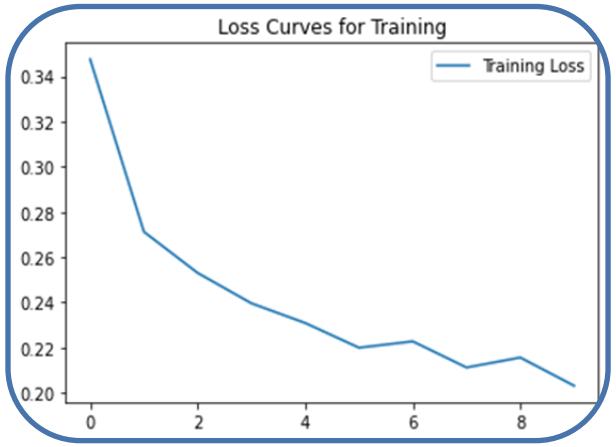
Loss Curves



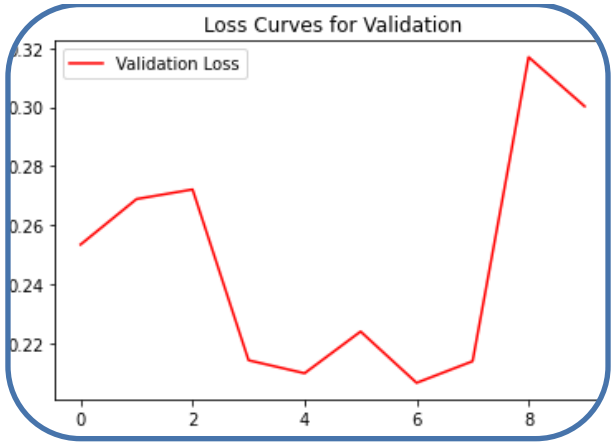
Task-1



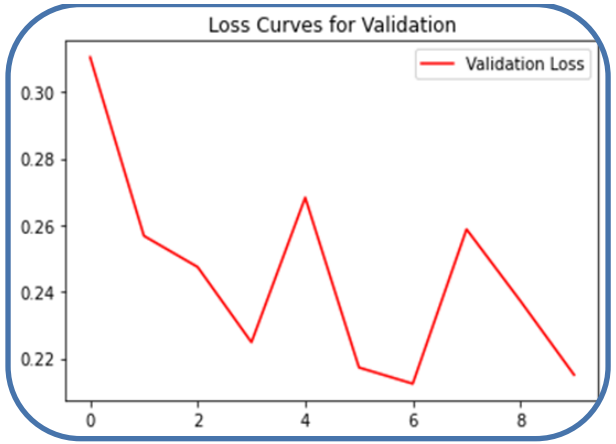
Task-2 (Last layer Unfreeze)



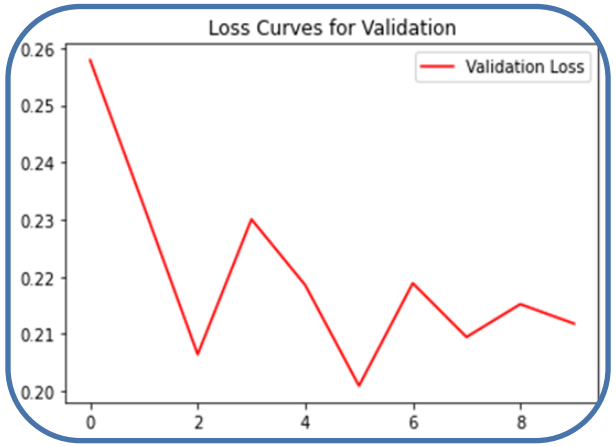
Task-2 All Layers Unfreeze



Task-1



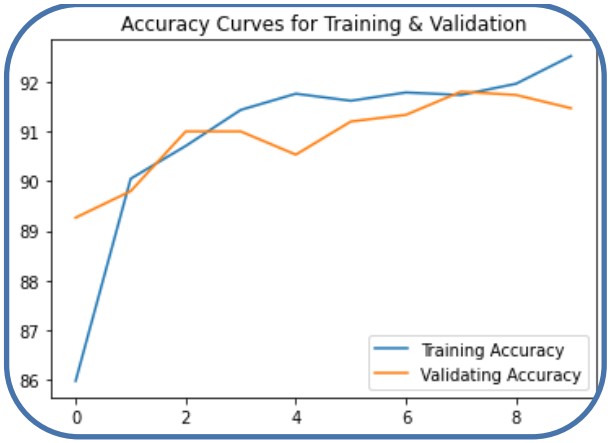
Task-2 (Last layer Unfreeze)



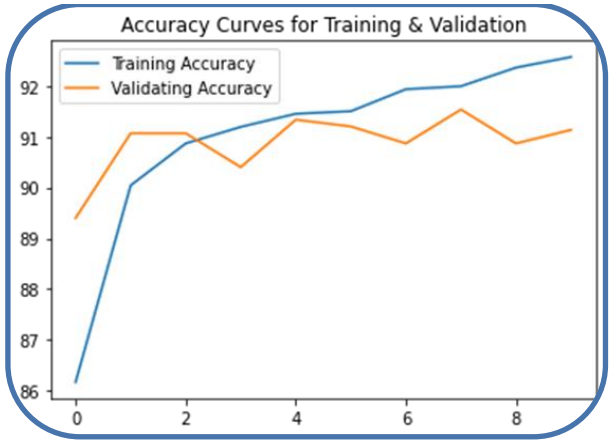
Task-2 All Layers Unfreeze

RESNET-18

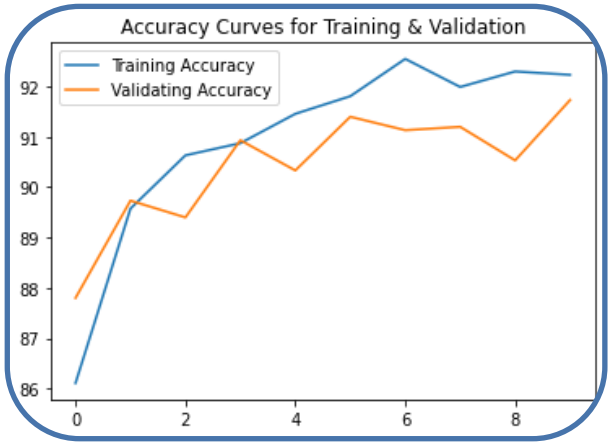
Training & Validation Accuracy



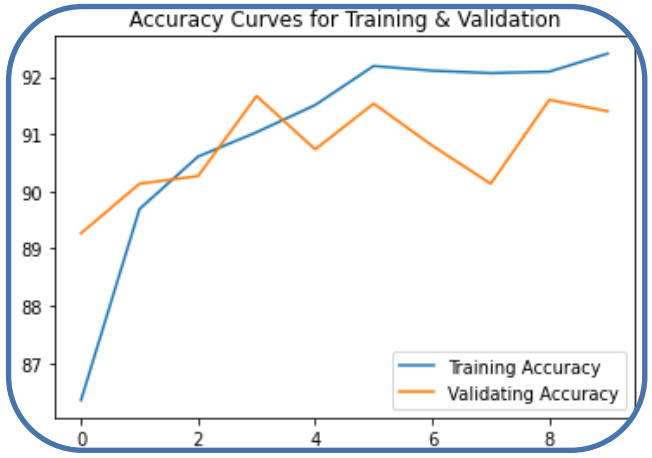
Task-1



Task-2 (Last layer Unfreeze)



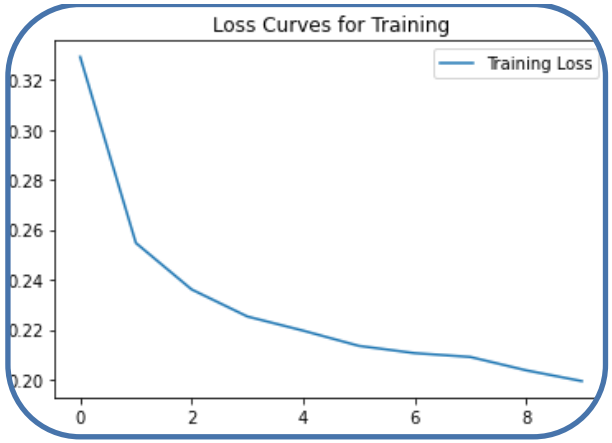
Task-2 Few Layers Unfreeze



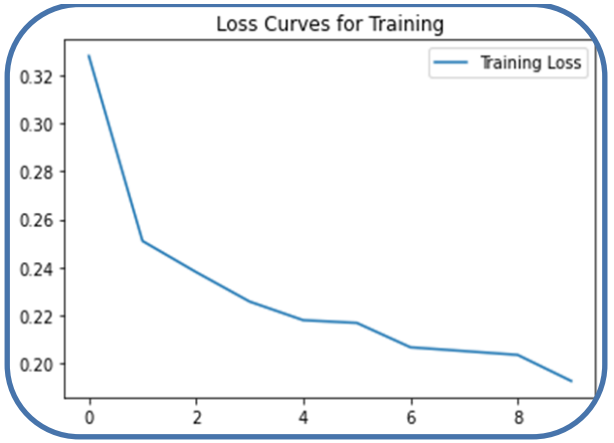
Task-2 All Layers Unfreeze

RESNET-18

Loss Curves



Task-1



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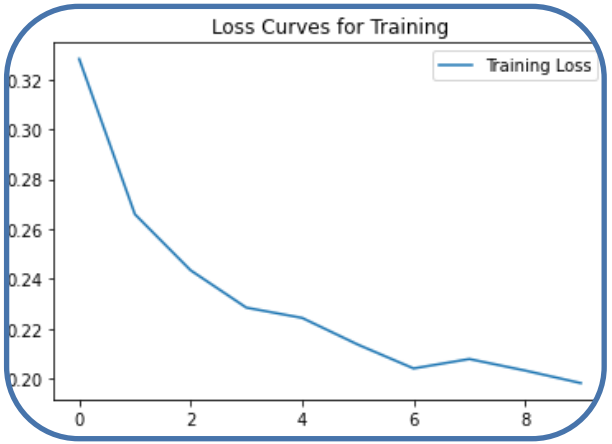
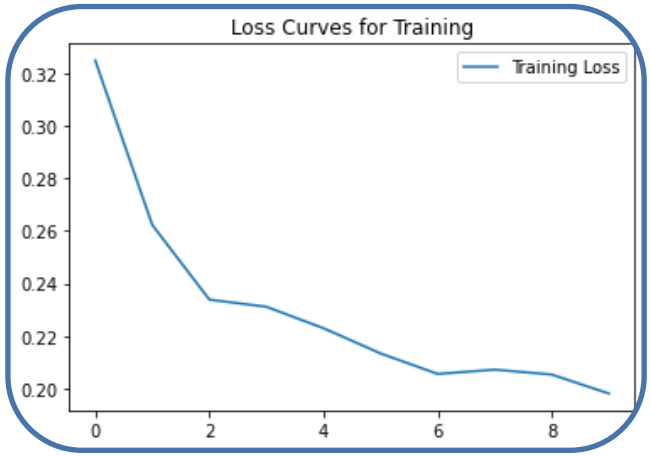


Task-2 Few Layers Unfreeze



Task-2 All Layers Unfreeze

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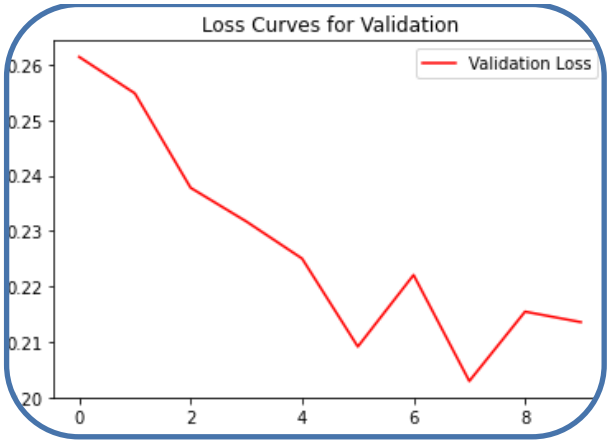

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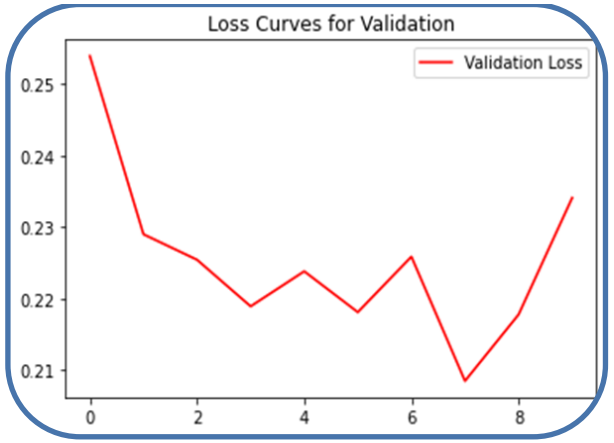
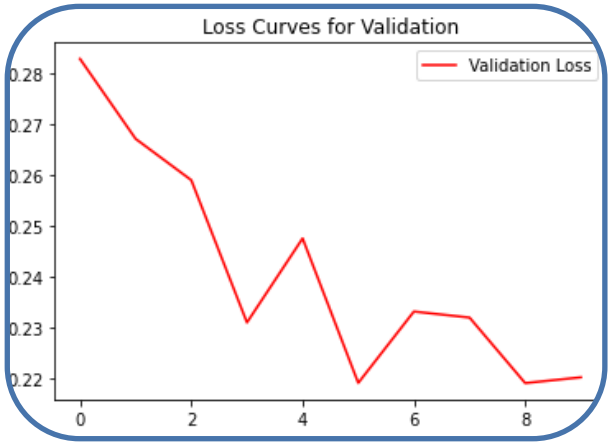
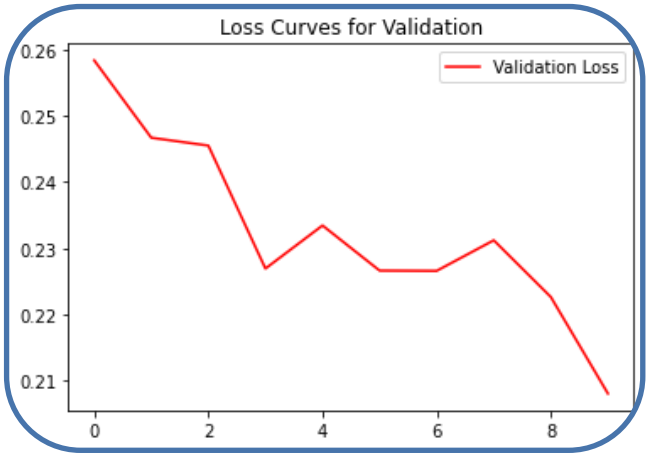


Task-2 (Last layer Unfreeze)



Task-2 Few Layers Unfreeze



Task-2 All Layers Unfreeze

PARAMETERS

Parameters for all tasks are as follows:

```
Epochs = 10
criterion = nn.CrossEntropyLoss()
optimizer = optim.SGD(resnet18.parameters(), lr=0.004, momentum=0.9)
```

LEARNING RATE @ 0.001 PROVIDED SLOW TRAINING AND LOWER ACCURACY.

DISCUSSION

- With pretuned validation accuracy for VGG-16 goes up and down.
- By fine tuning layers for VGG-16 the validation results become better also validation loss also becomes much smaller.
- By fine tuning all layers validation accuracy becomes better and fits with training accuracy more.
- For Resnet-18 validation loss drastically decreases by fine tuning convolutional layers.
- Validation accuracy for resnet-18 remains below training accuracy.
- Testing accuracies were however much higher for all experiments.