

# Assignment – 05 Part 2

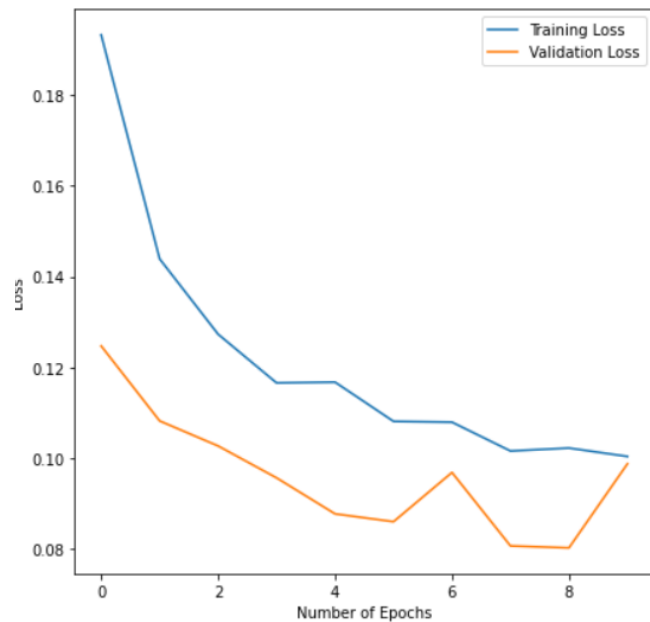
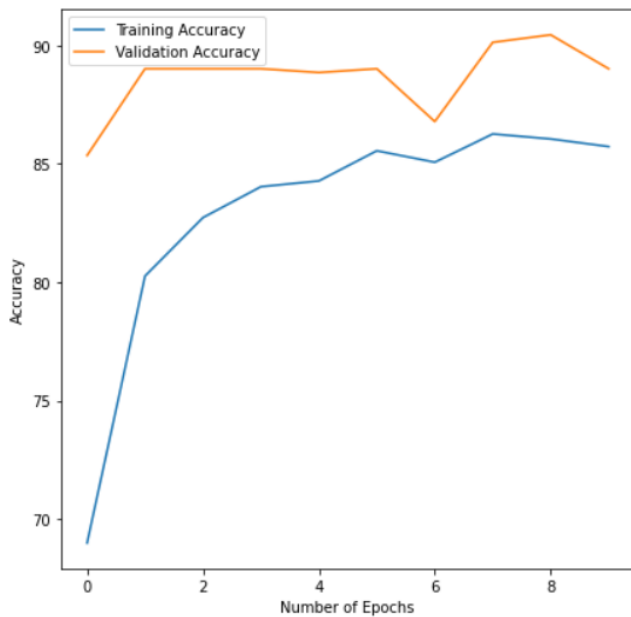
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MSDS19007

## Note:

All mentioned results are in the notebook

### 1. VGG16-Without-FocalLoss:



## For Training

Accuracy of the network on the training images: 87 %  
F1 score for covid-19 = 0.2212

Confusion matrix:

```
[[5999  1]
 [ 175 25]]
```

F1 score for normal = 0.9316

Confusion matrix:

```
[[1795 405]
 [ 159 3841]]
```

F1 score for pneumonia = 0.8404

Confusion matrix:

```
[[3944 256]
 [ 365 1635]]
```

## For Validation

Accuracy of the network on the training images: 90 %

F1 score for covid-19 = 0.3529

Confusion matrix:

```
[[600  0]
 [ 22  6]]
```

F1 score for normal = 0.9502

Confusion matrix:

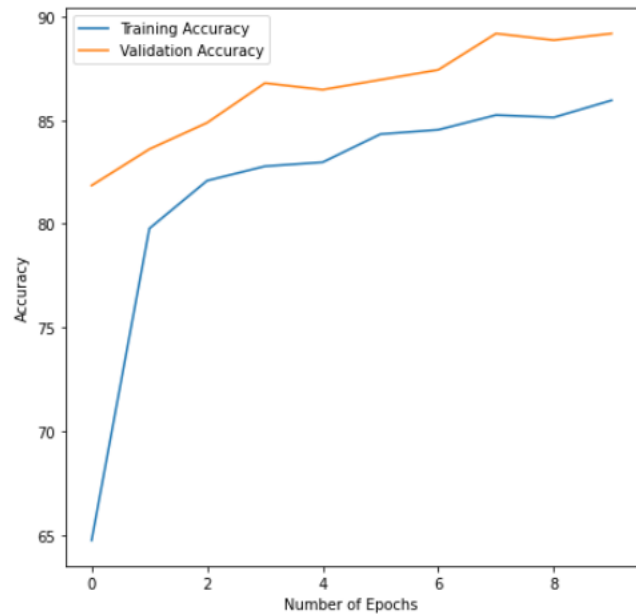
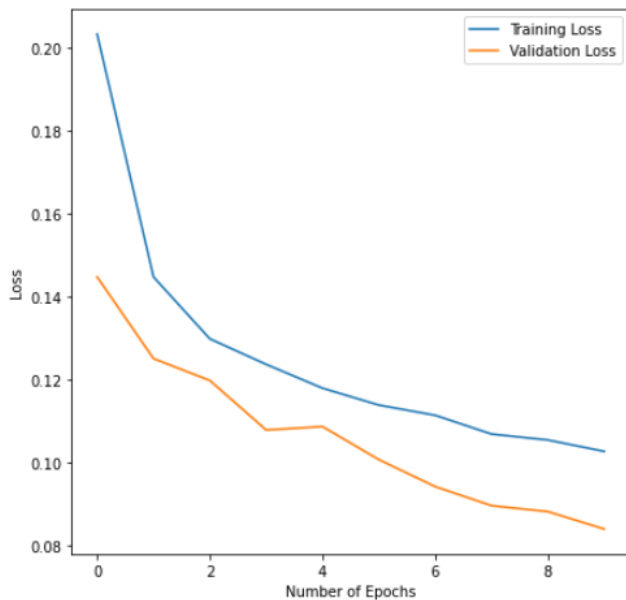
```
[[196 32]
 [  9 391]]
```

F1 score for pneumonia = 0.9040

Confusion matrix:

```
[[411 17]
 [ 21 179]]
```

## 2. Resnet18-Without FocalLoss:



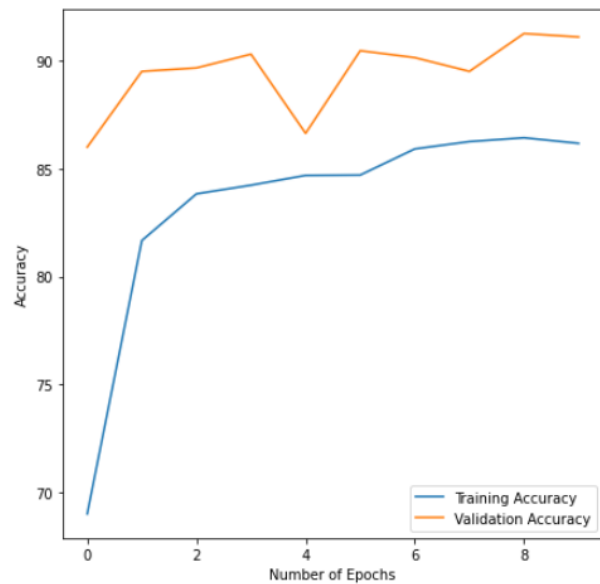
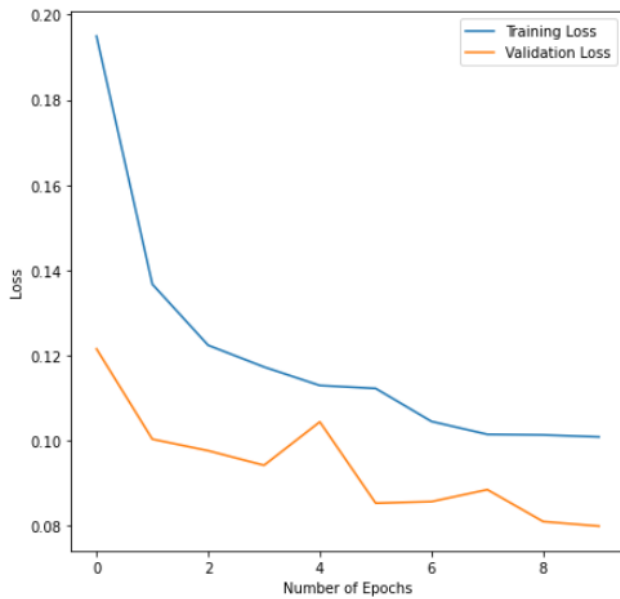
## For Training

➤ Accuracy of the network on the training images: 85 %  
F1 score for covid-19 = 0.2035  
Confusion matrix:  
[[5997 3]  
 [ 177 23]]  
  
F1 score for normal = 0.9219  
Confusion matrix:  
[[1837 363]  
 [ 269 3731]]  
  
F1 score for pneumonia = 0.8241  
Confusion matrix:  
[[3907 293]  
 [ 393 1607]]

## For Validation

Accuracy of the network on the training images: 87 %  
F1 score for covid-19 = 0.1935  
Confusion matrix:  
[[600 0]  
 [ 25 3]]  
  
F1 score for normal = 0.9271  
Confusion matrix:  
[[194 34]  
 [ 25 375]]  
  
F1 score for pneumonia = 0.8744  
Confusion matrix:  
[[404 24]  
 [ 26 174]]

### 3. VGG16-With FocalLoss:



## For Training

Accuracy of the network on the training images: 86 %

F1 score for covid-19 = 0.2203

Confusion matrix:

```
[[5998  2]
 [ 175 25]]
```

F1 score for normal = 0.9313

Confusion matrix:

```
[[1788 412]
 [ 155 3845]]
```

F1 score for pneumonia = 0.8394

Confusion matrix:

```
[[3934 266]
 [ 361 1639]]
```

## For Validation

Accuracy of the network on the training images: 91 %

F1 score for covid-19 = 0.3030

Confusion matrix:

```
[[600  0]
 [ 23  5]]
```

F1 score for normal = 0.9526

Confusion matrix:

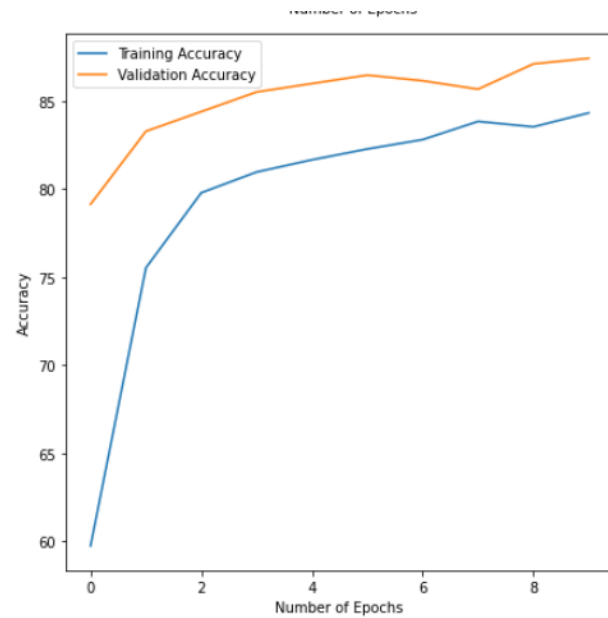
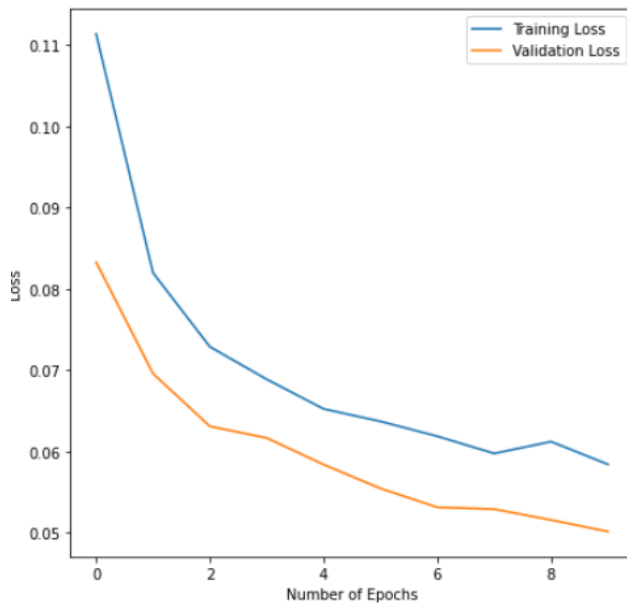
```
[[197 31]
 [  8 392]]
```

F1 score for pneumonia = 0.9192

Confusion matrix:

```
[[414 14]
 [ 18 182]]
```

## 4. Resnet18-With FocalLoss:



## **For Training**

Accuracy of the network on the training images: 83 %

F1 score for covid-19 = 0.2893

Confusion matrix:

```
[[5993  7]
 [ 165 35]]
```

F1 score for normal = 0.9159

Confusion matrix:

```
[[1856 344]
 [ 330 3670]]
```

F1 score for pneumonia = 0.8127

Confusion matrix:

```
[[3801 399]
 [ 358 1642]]
```

## **For Validation**

Accuracy of the network on the training images: 85 %

F1 score for covid-19 = 0.2500

Confusion matrix:

```
[[600  0]
 [ 24  4]]
```

F1 score for normal = 0.9164

Confusion matrix:

```
[[194  34]
 [ 33 367]]
```

F1 score for pneumonia = 0.8790

Confusion matrix:

```
[[401  27]
 [ 22 178]]
```

## **5. Best Results:**

Best results are obtained by vgg16 model when I applied focal loss as a criterion for weights update and you can find csv file containing the predicted results against each image.

## **6. Github Link:**

[https://github.com/nadeemriaz305/MSDS19007\\_COVID19\\_DLSpring2020](https://github.com/nadeemriaz305/MSDS19007_COVID19_DLSpring2020)