A Project

▼ PreliminaryModel

```
Training Binary Classifier model for Infected
PreliminaryModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=5184, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.487 -  Training F2-score: 0.860 -  Test Loss: 0.385 -  Test F2-score: 0.906 -  Test Accuracy: 0.833
Epoch: 2/5 -  Training Loss: 0.267 -  Training F2-score: 0.889 -  Test Loss: 0.429 -  Test F2-score: 0.912 -  Test Accuracy: 0.816
Epoch: 3/5 -  Training Loss: 0.227 -  Training F2-score: 0.903 -  Test Loss: 0.363 -  Test F2-score: 0.923 -  Test Accuracy: 0.839
Epoch: 4/5 -  Training Loss: 0.207 -  Training F2-score: 0.911 -  Test Loss: 0.415 -  Test F2-score: 0.916 -  Test Accuracy: 0.823
Epoch: 5/5 -  Training Loss: 0.180 -  Training F2-score: 0.917 -  Test Loss: 0.401 -  Test F2-score: 0.916 -  Test Accuracy: 0.837
Training Binary Classifier model for Covid
PreliminaryModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=5184, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.690 -  Training F2-score: 0.830 -  Test Loss: 0.692 -  Test F2-score: 0.742 -  Test Accuracy: 0.407
Epoch: 2/5 -  Training Loss: 0.648 -  Training F2-score: 0.833 -  Test Loss: 0.507 -  Test F2-score: 0.749 -  Test Accuracy: 0.822
Epoch: 3/5 -  Training Loss: 0.615 -  Training F2-score: 0.832 -  Test Loss: 0.513 -  Test F2-score: 0.752 -  Test Accuracy: 0.785
Epoch: 4/5 -  Training Loss: 0.606 -  Training F2-score: 0.833 -  Test Loss: 0.436 -  Test F2-score: 0.786 -  Test Accuracy: 0.819
Epoch: 5/5 -  Training Loss: 0.594 -  Training F2-score: 0.832 -  Test Loss: 0.469 -  Test F2-score: 0.760 -  Test Accuracy: 0.795
Infected label Accuracy: 0.8399999737739563
Covid label Accuracy: 0.5999999642372131
Overall correctly predicted labels: 0.68
```

▼ LowPassModel

```
Training Binary Classifier model for Infected
LowPassModel(
  (low): Conv2d(1, 1, kernel_size=(3, 3), stride=(1, 1), bias=False)
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=4900, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.426 -  Training F2-score: 0.876 -  Test Loss: 0.646 -  Test F2-score: 0.900 -  Test Accuracy: 0.732
Epoch: 2/5 -  Training Loss: 0.314 -  Training F2-score: 0.889 -  Test Loss: 0.422 -  Test F2-score: 0.910 -  Test Accuracy: 0.807
Epoch: 3/5 -  Training Loss: 0.278 -  Training F2-score: 0.895 -  Test Loss: 0.448 -  Test F2-score: 0.909 -  Test Accuracy: 0.796
Epoch: 4/5 -  Training Loss: 0.245 -  Training F2-score: 0.903 -  Test Loss: 0.459 -  Test F2-score: 0.906 -  Test Accuracy: 0.793
Epoch: 5/5 -  Training Loss: 0.253 -  Training F2-score: 0.906 -  Test Loss: 0.399 -  Test F2-score: 0.900 -  Test Accuracy: 0.815
Training Binary Classifier model for Covid
LowPassModel(
  (low): Conv2d(1, 1, kernel_size=(3, 3), stride=(1, 1), bias=False)
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=4900, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.678 -  Training F2-score: 0.834 -  Test Loss: 0.654 -  Test F2-score: 0.742 -  Test Accuracy: 0.551
Epoch: 2/5 -  Training Loss: 0.630 -  Training F2-score: 0.829 -  Test Loss: 0.477 -  Test F2-score: 0.750 -  Test Accuracy: 0.837
Epoch: 3/5 -  Training Loss: 0.613 -  Training F2-score: 0.828 -  Test Loss: 0.479 -  Test F2-score: 0.755 -  Test Accuracy: 0.822
Epoch: 4/5 -  Training Loss: 0.609 -  Training F2-score: 0.830 -  Test Loss: 0.451 -  Test F2-score: 0.811 -  Test Accuracy: 0.827
Epoch: 5/5 -  Training Loss: 0.611 -  Training F2-score: 0.830 -  Test Loss: 0.463 -  Test F2-score: 0.767 -  Test Accuracy: 0.840
Infected label Accuracy: 0.5999999642372131
Covid label Accuracy: 0.6399999856948853
Overall correctly predicted labels: 0.44
```

▼ HighPassModel

```
Training Binary Classifier model for Infected
HighPassModel(
  (high): Conv2d(1, 1, kernel_size=(3, 3), stride=(1, 1), bias=False)
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
```

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  (fc1): Linear(in_features=4900, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.595 -  Training F2-score: 0.838 -  Test Loss: 0.548 -  Test F2-score: 0.891 -  Test Accuracy: 0.659
Epoch: 2/5 -  Training Loss: 0.401 -  Training F2-score: 0.853 -  Test Loss: 0.524 -  Test F2-score: 0.892 -  Test Accuracy: 0.693
Epoch: 3/5 -  Training Loss: 0.342 -  Training F2-score: 0.862 -  Test Loss: 0.412 -  Test F2-score: 0.905 -  Test Accuracy: 0.807
Epoch: 4/5 -  Training Loss: 0.324 -  Training F2-score: 0.868 -  Test Loss: 0.665 -  Test F2-score: 0.890 -  Test Accuracy: 0.675
Epoch: 5/5 -  Training Loss: 0.319 -  Training F2-score: 0.872 -  Test Loss: 0.677 -  Test F2-score: 0.890 -  Test Accuracy: 0.672
Training Binary Classifier model for Covid
HighPassModel(
  (high): Conv2d(1, 1, kernel_size=(3, 3), stride=(1, 1), bias=False)
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=4900, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.701 -  Training F2-score: 0.833 -  Test Loss: 0.698 -  Test F2-score: 0.742 -  Test Accuracy: 0.365
Epoch: 2/5 -  Training Loss: 0.693 -  Training F2-score: 0.834 -  Test Loss: 0.693 -  Test F2-score: 0.742 -  Test Accuracy: 0.417
Epoch: 3/5 -  Training Loss: 0.691 -  Training F2-score: 0.835 -  Test Loss: 0.689 -  Test F2-score: 0.742 -  Test Accuracy: 0.735
Epoch: 4/5 -  Training Loss: 0.686 -  Training F2-score: 0.835 -  Test Loss: 0.675 -  Test F2-score: 0.742 -  Test Accuracy: 0.635
Epoch: 5/5 -  Training Loss: 0.665 -  Training F2-score: 0.834 -  Test Loss: 0.651 -  Test F2-score: 0.742 -  Test Accuracy: 0.659
Infected label Accuracy: 0.7599999904632568
Covid label Accuracy: 0.6399999856948853
Overall correctly predicted labels: 0.4
```

▼ OneModel

```
Training Binary Classifier model for Infected
OneModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=21904, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.747 -  Training F2-score: 0.795 -  Test Loss: 0.381 -  Test F2-score: 0.915 -  Test Accuracy: 0.842
Epoch: 2/5 -  Training Loss: 0.289 -  Training F2-score: 0.854 -  Test Loss: 0.361 -  Test F2-score: 0.906 -  Test Accuracy: 0.829
Epoch: 3/5 -  Training Loss: 0.262 -  Training F2-score: 0.877 -  Test Loss: 0.335 -  Test F2-score: 0.905 -  Test Accuracy: 0.862
Epoch: 4/5 -  Training Loss: 0.225 -  Training F2-score: 0.890 -  Test Loss: 0.351 -  Test F2-score: 0.914 -  Test Accuracy: 0.844
Epoch: 5/5 -  Training Loss: 0.201 -  Training F2-score: 0.900 -  Test Loss: 0.368 -  Test F2-score: 0.910 -  Test Accuracy: 0.837
Training Binary Classifier model for Covid
OneModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=21904, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.840 -  Training F2-score: 0.770 -  Test Loss: 0.581 -  Test F2-score: 0.743 -  Test Accuracy: 0.753
Epoch: 2/5 -  Training Loss: 0.656 -  Training F2-score: 0.797 -  Test Loss: 0.587 -  Test F2-score: 0.742 -  Test Accuracy: 0.688
Epoch: 3/5 -  Training Loss: 0.626 -  Training F2-score: 0.807 -  Test Loss: 0.446 -  Test F2-score: 0.775 -  Test Accuracy: 0.837
Epoch: 4/5 -  Training Loss: 0.602 -  Training F2-score: 0.812 -  Test Loss: 0.494 -  Test F2-score: 0.760 -  Test Accuracy: 0.798
Epoch: 5/5 -  Training Loss: 0.616 -  Training F2-score: 0.814 -  Test Loss: 0.516 -  Test F2-score: 0.757 -  Test Accuracy: 0.764
Infected label Accuracy: 0.7599999904632568
Covid label Accuracy: 0.5199999809265137
Overall correctly predicted labels: 0.56
```

▼ ThreeModel

```
Training Binary Classifier model for Infected
ThreeModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv3): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool3): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=1156, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.626 -  Training F2-score: 0.833 -  Test Loss: 0.492 -  Test F2-score: 0.891 -  Test Accuracy: 0.831
Epoch: 2/5 -  Training Loss: 0.378 -  Training F2-score: 0.863 -  Test Loss: 0.329 -  Test F2-score: 0.922 -  Test Accuracy: 0.862
Epoch: 3/5 -  Training Loss: 0.275 -  Training F2-score: 0.880 -  Test Loss: 0.342 -  Test F2-score: 0.932 -  Test Accuracy: 0.839
Epoch: 4/5 -  Training Loss: 0.274 -  Training F2-score: 0.887 -  Test Loss: 0.322 -  Test F2-score: 0.912 -  Test Accuracy: 0.854
Epoch: 5/5 -  Training Loss: 0.235 -  Training F2-score: 0.894 -  Test Loss: 0.312 -  Test F2-score: 0.923 -  Test Accuracy: 0.859
Training Binary Classifier model for Covid
ThreeModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv3): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool3): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=1156, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.693 -  Training F2-score: 0.831 -  Test Loss: 0.664 -  Test F2-score: 0.742 -  Test Accuracy: 0.635
```

```
Epoch: 2/5 -  Training Loss: 0.680 -  Training F2-score: 0.831 -  Test Loss: 0.631 -  Test F2-score: 0.742 -  Test Accuracy: 0.664
Epoch: 3/5 -  Training Loss: 0.653 -  Training F2-score: 0.831 -  Test Loss: 0.600 -  Test F2-score: 0.742 -  Test Accuracy: 0.667
Epoch: 4/5 -  Training Loss: 0.638 -  Training F2-score: 0.831 -  Test Loss: 0.555 -  Test F2-score: 0.742 -  Test Accuracy: 0.748
Epoch: 5/5 -  Training Loss: 0.633 -  Training F2-score: 0.830 -  Test Loss: 0.492 -  Test F2-score: 0.746 -  Test Accuracy: 0.843
Infected label Accuracy: 0.6800000071525574
Covid label Accuracy: 0.6399999856948853
Overall correctly predicted labels: 0.56
```

Batch sizes

▼ 8

```
Training Binary Classifier model for Infected
PreliminaryModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=5184, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.413 -  Training F2-score: 0.883 -  Test Loss: 0.439 -  Test F2-score: 0.908 -  Test Accuracy: 0.790
Epoch: 2/5 -  Training Loss: 0.209 -  Training F2-score: 0.909 -  Test Loss: 0.361 -  Test F2-score: 0.921 -  Test Accuracy: 0.856
Epoch: 3/5 -  Training Loss: 0.193 -  Training F2-score: 0.921 -  Test Loss: 0.330 -  Test F2-score: 0.924 -  Test Accuracy: 0.872
Epoch: 4/5 -  Training Loss: 0.176 -  Training F2-score: 0.926 -  Test Loss: 0.387 -  Test F2-score: 0.924 -  Test Accuracy: 0.836
Epoch: 5/5 -  Training Loss: 0.164 -  Training F2-score: 0.930 -  Test Loss: 0.496 -  Test F2-score: 0.907 -  Test Accuracy: 0.789
Training Binary Classifier model for Covid
PreliminaryModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=5184, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.678 -  Training F2-score: 0.825 -  Test Loss: 0.567 -  Test F2-score: 0.742 -  Test Accuracy: 0.798
Epoch: 2/5 -  Training Loss: 0.622 -  Training F2-score: 0.827 -  Test Loss: 0.537 -  Test F2-score: 0.754 -  Test Accuracy: 0.793
Epoch: 3/5 -  Training Loss: 0.613 -  Training F2-score: 0.829 -  Test Loss: 0.411 -  Test F2-score: 0.815 -  Test Accuracy: 0.856
Epoch: 4/5 -  Training Loss: 0.622 -  Training F2-score: 0.825 -  Test Loss: 0.556 -  Test F2-score: 0.745 -  Test Accuracy: 0.761
Epoch: 5/5 -  Training Loss: 0.607 -  Training F2-score: 0.827 -  Test Loss: 0.445 -  Test F2-score: 0.784 -  Test Accuracy: 0.835
Infected label Accuracy: 0.7999999523162842
Covid label Accuracy: 0.5199999809265137
Overall correctly predicted labels: 0.56
```

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```
Training Binary Classifier model for Infected
PreliminaryModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=5184, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.466 -  Training F2-score: 0.873 -  Test Loss: 0.405 -  Test F2-score: 0.891 -  Test Accuracy: 0.826
Epoch: 2/5 -  Training Loss: 0.267 -  Training F2-score: 0.895 -  Test Loss: 0.413 -  Test F2-score: 0.906 -  Test Accuracy: 0.829
Epoch: 3/5 -  Training Loss: 0.258 -  Training F2-score: 0.903 -  Test Loss: 0.401 -  Test F2-score: 0.908 -  Test Accuracy: 0.828
Epoch: 4/5 -  Training Loss: 0.222 -  Training F2-score: 0.910 -  Test Loss: 0.383 -  Test F2-score: 0.921 -  Test Accuracy: 0.844
Epoch: 5/5 -  Training Loss: 0.198 -  Training F2-score: 0.915 -  Test Loss: 0.483 -  Test F2-score: 0.916 -  Test Accuracy: 0.826
Training Binary Classifier model for Covid
PreliminaryModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=5184, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.678 -  Training F2-score: 0.840 -  Test Loss: 0.565 -  Test F2-score: 0.743 -  Test Accuracy: 0.808
Epoch: 2/5 -  Training Loss: 0.629 -  Training F2-score: 0.829 -  Test Loss: 0.493 -  Test F2-score: 0.760 -  Test Accuracy: 0.824
Epoch: 3/5 -  Training Loss: 0.625 -  Training F2-score: 0.830 -  Test Loss: 0.487 -  Test F2-score: 0.761 -  Test Accuracy: 0.796
Epoch: 4/5 -  Training Loss: 0.625 -  Training F2-score: 0.830 -  Test Loss: 0.476 -  Test F2-score: 0.772 -  Test Accuracy: 0.835
Epoch: 5/5 -  Training Loss: 0.625 -  Training F2-score: 0.832 -  Test Loss: 0.497 -  Test F2-score: 0.760 -  Test Accuracy: 0.814
Infected label Accuracy: 0.8399999737739563
Covid label Accuracy: 0.5999999642372131
Overall correctly predicted labels: 0.6
```

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```
Training Binary Classifier model for Infected
PreliminaryModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=5184, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.396 -  Training F2-score: 0.878 -  Test Loss: 0.401 -  Test F2-score: 0.910 -  Test Accuracy: 0.816
Epoch: 2/5 -  Training Loss: 0.253 -  Training F2-score: 0.903 -  Test Loss: 0.370 -  Test F2-score: 0.914 -  Test Accuracy: 0.828
Epoch: 3/5 -  Training Loss: 0.233 -  Training F2-score: 0.912 -  Test Loss: 0.494 -  Test F2-score: 0.907 -  Test Accuracy: 0.792
Epoch: 4/5 -  Training Loss: 0.209 -  Training F2-score: 0.919 -  Test Loss: 0.426 -  Test F2-score: 0.915 -  Test Accuracy: 0.818
Epoch: 5/5 -  Training Loss: 0.195 -  Training F2-score: 0.923 -  Test Loss: 0.430 -  Test F2-score: 0.912 -  Test Accuracy: 0.824
Training Binary Classifier model for Covid
PreliminaryModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=5184, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.689 -  Training F2-score: 0.830 -  Test Loss: 0.578 -  Test F2-score: 0.742 -  Test Accuracy: 0.843
Epoch: 2/5 -  Training Loss: 0.647 -  Training F2-score: 0.836 -  Test Loss: 0.502 -  Test F2-score: 0.743 -  Test Accuracy: 0.858
Epoch: 3/5 -  Training Loss: 0.642 -  Training F2-score: 0.834 -  Test Loss: 0.562 -  Test F2-score: 0.742 -  Test Accuracy: 0.786
Epoch: 4/5 -  Training Loss: 0.628 -  Training F2-score: 0.834 -  Test Loss: 0.482 -  Test F2-score: 0.751 -  Test Accuracy: 0.853
Epoch: 5/5 -  Training Loss: 0.619 -  Training F2-score: 0.834 -  Test Loss: 0.445 -  Test F2-score: 0.765 -  Test Accuracy: 0.848
Infected label Accuracy: 0.7599999904632568
Covid label Accuracy: 0.5999999642372131
Overall correctly predicted labels: 0.56
```

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```
Training Binary Classifier model for Infected
PreliminaryModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=5184, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.575 -  Training F2-score: 0.842 -  Test Loss: 0.442 -  Test F2-score: 0.923 -  Test Accuracy: 0.813
Epoch: 2/5 -  Training Loss: 0.323 -  Training F2-score: 0.872 -  Test Loss: 0.346 -  Test F2-score: 0.922 -  Test Accuracy: 0.833
Epoch: 3/5 -  Training Loss: 0.262 -  Training F2-score: 0.887 -  Test Loss: 0.395 -  Test F2-score: 0.913 -  Test Accuracy: 0.833
Epoch: 4/5 -  Training Loss: 0.232 -  Training F2-score: 0.896 -  Test Loss: 0.370 -  Test F2-score: 0.913 -  Test Accuracy: 0.826
Epoch: 5/5 -  Training Loss: 0.221 -  Training F2-score: 0.903 -  Test Loss: 0.372 -  Test F2-score: 0.919 -  Test Accuracy: 0.833
Training Binary Classifier model for Covid
PreliminaryModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=5184, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.699 -  Training F2-score: 0.829 -  Test Loss: 0.689 -  Test F2-score: 0.742 -  Test Accuracy: 0.732
Epoch: 2/5 -  Training Loss: 0.663 -  Training F2-score: 0.829 -  Test Loss: 0.571 -  Test F2-score: 0.744 -  Test Accuracy: 0.808
Epoch: 3/5 -  Training Loss: 0.633 -  Training F2-score: 0.828 -  Test Loss: 0.532 -  Test F2-score: 0.747 -  Test Accuracy: 0.861
Epoch: 4/5 -  Training Loss: 0.627 -  Training F2-score: 0.830 -  Test Loss: 0.489 -  Test F2-score: 0.751 -  Test Accuracy: 0.866
Epoch: 5/5 -  Training Loss: 0.624 -  Training F2-score: 0.829 -  Test Loss: 0.474 -  Test F2-score: 0.753 -  Test Accuracy: 0.869
Infected label Accuracy: 0.5999999642372131
Covid label Accuracy: 0.5199999809265137
Overall correctly predicted labels: 0.44
```

▼ 128

```
Training Binary Classifier model for Infected
PreliminaryModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=5184, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.698 -  Training F2-score: 0.835 -  Test Loss: 0.695 -  Test F2-score: 0.891 -  Test Accuracy: 0.386
Epoch: 2/5 -  Training Loss: 0.567 -  Training F2-score: 0.836 -  Test Loss: 0.415 -  Test F2-score: 0.902 -  Test Accuracy: 0.818
Epoch: 3/5 -  Training Loss: 0.362 -  Training F2-score: 0.852 -  Test Loss: 0.359 -  Test F2-score: 0.913 -  Test Accuracy: 0.842
Epoch: 4/5 -  Training Loss: 0.288 -  Training F2-score: 0.867 -  Test Loss: 0.321 -  Test F2-score: 0.924 -  Test Accuracy: 0.852
Epoch: 5/5 -  Training Loss: 0.252 -  Training F2-score: 0.878 -  Test Loss: 0.312 -  Test F2-score: 0.923 -  Test Accuracy: 0.857
Training Binary Classifier model for Covid
PreliminaryModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
```

```
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=5184, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.703 -  Training F2-score: 0.837 -  Test Loss: 0.727 -  Test F2-score: 0.742 -  Test Accuracy: 0.365
Epoch: 2/5 -  Training Loss: 0.694 -  Training F2-score: 0.832 -  Test Loss: 0.690 -  Test F2-score: 0.742 -  Test Accuracy: 0.651
Epoch: 3/5 -  Training Loss: 0.688 -  Training F2-score: 0.834 -  Test Loss: 0.670 -  Test F2-score: 0.742 -  Test Accuracy: 0.803
Epoch: 4/5 -  Training Loss: 0.676 -  Training F2-score: 0.831 -  Test Loss: 0.606 -  Test F2-score: 0.742 -  Test Accuracy: 0.798
Epoch: 5/5 -  Training Loss: 0.655 -  Training F2-score: 0.832 -  Test Loss: 0.543 -  Test F2-score: 0.739 -  Test Accuracy: 0.714
Infected label Accuracy: 0.6800000071525574
Covid label Accuracy: 0.6399999856948853
Overall correctly predicted labels: 0.48
```

Learning rates

▼ 0.01

```
Training Binary Classifier model for Infected
PreliminaryModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=5184, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.402 -  Training F2-score: 0.882 -  Test Loss: 0.451 -  Test F2-score: 0.903 -  Test Accuracy: 0.823
Epoch: 2/5 -  Training Loss: 0.291 -  Training F2-score: 0.897 -  Test Loss: 0.434 -  Test F2-score: 0.896 -  Test Accuracy: 0.798
Epoch: 3/5 -  Training Loss: 0.275 -  Training F2-score: 0.902 -  Test Loss: 0.416 -  Test F2-score: 0.908 -  Test Accuracy: 0.826
Epoch: 4/5 -  Training Loss: 0.267 -  Training F2-score: 0.906 -  Test Loss: 0.368 -  Test F2-score: 0.915 -  Test Accuracy: 0.829
Epoch: 5/5 -  Training Loss: 0.248 -  Training F2-score: 0.910 -  Test Loss: 0.450 -  Test F2-score: 0.908 -  Test Accuracy: 0.823
Training Binary Classifier model for Covid
PreliminaryModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=5184, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.786 -  Training F2-score: 0.833 -  Test Loss: 0.690 -  Test F2-score: 0.742 -  Test Accuracy: 0.635
Epoch: 2/5 -  Training Loss: 0.693 -  Training F2-score: 0.832 -  Test Loss: 0.691 -  Test F2-score: 0.742 -  Test Accuracy: 0.635
Epoch: 3/5 -  Training Loss: 0.701 -  Training F2-score: 0.832 -  Test Loss: 0.688 -  Test F2-score: 0.742 -  Test Accuracy: 0.635
Epoch: 4/5 -  Training Loss: 0.694 -  Training F2-score: 0.832 -  Test Loss: 0.689 -  Test F2-score: 0.742 -  Test Accuracy: 0.635
Epoch: 5/5 -  Training Loss: 0.694 -  Training F2-score: 0.833 -  Test Loss: 0.694 -  Test F2-score: 0.742 -  Test Accuracy: 0.365
Infected label Accuracy: 0.8399999737739563
Covid label Accuracy: 0.6399999856948853
Overall correctly predicted labels: 0.52
```

▼ 0.001

```
Training Binary Classifier model for Infected
PreliminaryModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=5184, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.458 -  Training F2-score: 0.875 -  Test Loss: 0.329 -  Test F2-score: 0.912 -  Test Accuracy: 0.859
Epoch: 2/5 -  Training Loss: 0.245 -  Training F2-score: 0.899 -  Test Loss: 0.312 -  Test F2-score: 0.920 -  Test Accuracy: 0.854
Epoch: 3/5 -  Training Loss: 0.239 -  Training F2-score: 0.907 -  Test Loss: 0.419 -  Test F2-score: 0.919 -  Test Accuracy: 0.807
Epoch: 4/5 -  Training Loss: 0.211 -  Training F2-score: 0.913 -  Test Loss: 0.409 -  Test F2-score: 0.921 -  Test Accuracy: 0.824
Epoch: 5/5 -  Training Loss: 0.195 -  Training F2-score: 0.918 -  Test Loss: 0.316 -  Test F2-score: 0.906 -  Test Accuracy: 0.852
Training Binary Classifier model for Covid
PreliminaryModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=5184, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.706 -  Training F2-score: 0.826 -  Test Loss: 0.645 -  Test F2-score: 0.742 -  Test Accuracy: 0.759
Epoch: 2/5 -  Training Loss: 0.655 -  Training F2-score: 0.832 -  Test Loss: 0.535 -  Test F2-score: 0.742 -  Test Accuracy: 0.837
Epoch: 3/5 -  Training Loss: 0.632 -  Training F2-score: 0.833 -  Test Loss: 0.540 -  Test F2-score: 0.742 -  Test Accuracy: 0.764
Epoch: 4/5 -  Training Loss: 0.612 -  Training F2-score: 0.832 -  Test Loss: 0.522 -  Test F2-score: 0.743 -  Test Accuracy: 0.759
Epoch: 5/5 -  Training Loss: 0.619 -  Training F2-score: 0.832 -  Test Loss: 0.465 -  Test F2-score: 0.758 -  Test Accuracy: 0.848
Infected label Accuracy: 0.6399999856948853
```

```
Covid label Accuracy: 0.6800000071525574
Overall correctly predicted labels: 0.52
```

▼ 0.0001

```
Training Binary Classifier model for Infected
PreliminaryModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=5184, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.692 -  Training F2-score: 0.833 -  Test Loss: 0.701 -  Test F2-score: 0.891 -  Test Accuracy: 0.386
Epoch: 2/5 -  Training Loss: 0.683 -  Training F2-score: 0.828 -  Test Loss: 0.682 -  Test F2-score: 0.891 -  Test Accuracy: 0.615
Epoch: 3/5 -  Training Loss: 0.645 -  Training F2-score: 0.831 -  Test Loss: 0.638 -  Test F2-score: 0.891 -  Test Accuracy: 0.763
Epoch: 4/5 -  Training Loss: 0.604 -  Training F2-score: 0.832 -  Test Loss: 0.589 -  Test F2-score: 0.891 -  Test Accuracy: 0.807
Epoch: 5/5 -  Training Loss: 0.562 -  Training F2-score: 0.833 -  Test Loss: 0.561 -  Test F2-score: 0.891 -  Test Accuracy: 0.829
Training Binary Classifier model for Covid
PreliminaryModel(
  (conv1): Conv2d(1, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_1): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (conv2): Conv2d(4, 4, kernel_size=(3, 3), stride=(1, 1))
  (maxpool_2): MaxPool2d(kernel_size=2, stride=2, padding=0, dilation=1, ceil_mode=False)
  (fc1): Linear(in_features=5184, out_features=2, bias=True)
)
Epoch: 1/5 -  Training Loss: 0.694 -  Training F2-score: 0.830 -  Test Loss: 0.692 -  Test F2-score: 0.742 -  Test Accuracy: 0.562
Epoch: 2/5 -  Training Loss: 0.693 -  Training F2-score: 0.830 -  Test Loss: 0.684 -  Test F2-score: 0.742 -  Test Accuracy: 0.635
Epoch: 3/5 -  Training Loss: 0.690 -  Training F2-score: 0.833 -  Test Loss: 0.704 -  Test F2-score: 0.742 -  Test Accuracy: 0.365
Epoch: 4/5 -  Training Loss: 0.688 -  Training F2-score: 0.832 -  Test Loss: 0.674 -  Test F2-score: 0.742 -  Test Accuracy: 0.777
Epoch: 5/5 -  Training Loss: 0.680 -  Training F2-score: 0.831 -  Test Loss: 0.649 -  Test F2-score: 0.742 -  Test Accuracy: 0.751
Infected label Accuracy: 0.3199999928474426
Covid label Accuracy: 0.6399999856948853
Overall correctly predicted labels: 0.32
```

▼ Brute Forcing models

```
----------------------------------
Testing for PreliminaryModel infectmodel and PreliminaryModel covid model
----------------------------------
Overall correctly predicted labels: 0.776
F2-scores for: normal 0.767, non-covid 0.871, covid 0.616

----------------------------------
Testing for PreliminaryModel infectmodel and LowPass covid model
----------------------------------
Overall correctly predicted labels: 0.702
F2-scores for: normal 0.767, non-covid 0.840, covid 0.281

----------------------------------
Testing for PreliminaryModel infectmodel and HighPass covid model
----------------------------------
Overall correctly predicted labels: 0.649
F2-scores for: normal 0.767, non-covid 0.813, covid 0.000

----------------------------------
Testing for PreliminaryModel infectmodel and OneModel covid model
----------------------------------
Overall correctly predicted labels: 0.776
F2-scores for: normal 0.767, non-covid 0.858, covid 0.645

----------------------------------
Testing for PreliminaryModel infectmodel and ThreeModel covid model
----------------------------------
Overall correctly predicted labels: 0.691
F2-scores for: normal 0.767, non-covid 0.838, covid 0.218

----------------------------------
Testing for LowPass infectmodel and PreliminaryModel covid model
----------------------------------
Overall correctly predicted labels: 0.748
F2-scores for: normal 0.824, non-covid 0.844, covid 0.414

----------------------------------
Testing for LowPass infectmodel and LowPass covid model
----------------------------------
Overall correctly predicted labels: 0.698
F2-scores for: normal 0.824, non-covid 0.826, covid 0.147
```

```
----------------------------------
Testing for LowPass infectmodel and HighPass covid model
----------------------------------
Overall correctly predicted labels: 0.672
F2-scores for: normal 0.824, non-covid 0.816, covid 0.000

----------------------------------
Testing for LowPass infectmodel and OneModel covid model
----------------------------------
Overall correctly predicted labels: 0.748
F2-scores for: normal 0.824, non-covid 0.833, covid 0.444

----------------------------------
Testing for LowPass infectmodel and ThreeModel covid model
----------------------------------
Overall correctly predicted labels: 0.689
F2-scores for: normal 0.824, non-covid 0.826, covid 0.096

----------------------------------
Testing for HighPass infectmodel and PreliminaryModel covid model
----------------------------------
Overall correctly predicted labels: 0.672
F2-scores for: normal 0.474, non-covid 0.858, covid 0.635

----------------------------------
Testing for HighPass infectmodel and LowPass covid model
----------------------------------
Overall correctly predicted labels: 0.602
F2-scores for: normal 0.474, non-covid 0.821, covid 0.342

----------------------------------
Testing for HighPass infectmodel and HighPass covid model
----------------------------------
Overall correctly predicted labels: 0.530
F2-scores for: normal 0.474, non-covid 0.771, covid 0.000

----------------------------------
Testing for HighPass infectmodel and OneModel covid model
----------------------------------
Overall correctly predicted labels: 0.670
F2-scores for: normal 0.474, non-covid 0.842, covid 0.656

----------------------------------
Testing for HighPass infectmodel and ThreeModel covid model
----------------------------------
Overall correctly predicted labels: 0.590
F2-scores for: normal 0.474, non-covid 0.815, covid 0.292

----------------------------------
Testing for OneModel infectmodel and PreliminaryModel covid model
----------------------------------
Overall correctly predicted labels: 0.779
F2-scores for: normal 0.837, non-covid 0.849, covid 0.536

----------------------------------
Testing for OneModel infectmodel and LowPass covid model
----------------------------------
Overall correctly predicted labels: 0.714
F2-scores for: normal 0.837, non-covid 0.824, covid 0.221

----------------------------------
Testing for OneModel infectmodel and HighPass covid model
----------------------------------
Overall correctly predicted labels: 0.673
F2-scores for: normal 0.837, non-covid 0.807, covid 0.000

----------------------------------
Testing for OneModel infectmodel and OneModel covid model
----------------------------------
Overall correctly predicted labels: 0.782
F2-scores for: normal 0.837, non-covid 0.843, covid 0.569

----------------------------------
Testing for OneModel infectmodel and ThreeModel covid model
----------------------------------
Overall correctly predicted labels: 0.704
F2-scores for: normal 0.837, non-covid 0.823, covid 0.164

----------------------------------
Testing for ThreeModel infectmodel and PreliminaryModel covid model
----------------------------------
Overall correctly predicted labels: 0.787
F2-scores for: normal 0.881, non-covid 0.849, covid 0.484

----------------------------------
Testing for ThreeModel infectmodel and LowPass covid model
----------------------------------
```

```
Overall correctly predicted labels: 0.733
F2-scores for: normal 0.881, non-covid 0.831, covid 0.213

----------------------------------
Testing for ThreeModel infectmodel and HighPass covid model
----------------------------------
Overall correctly predicted labels: 0.694
F2-scores for: normal 0.881, non-covid 0.816, covid 0.000

----------------------------------
Testing for ThreeModel infectmodel and OneModel covid model
----------------------------------
Overall correctly predicted labels: 0.789
F2-scores for: normal 0.881, non-covid 0.839, covid 0.516

----------------------------------
Testing for ThreeModel infectmodel and ThreeModel covid model
----------------------------------
Overall correctly predicted labels: 0.717
F2-scores for: normal 0.881, non-covid 0.827, covid 0.122
```