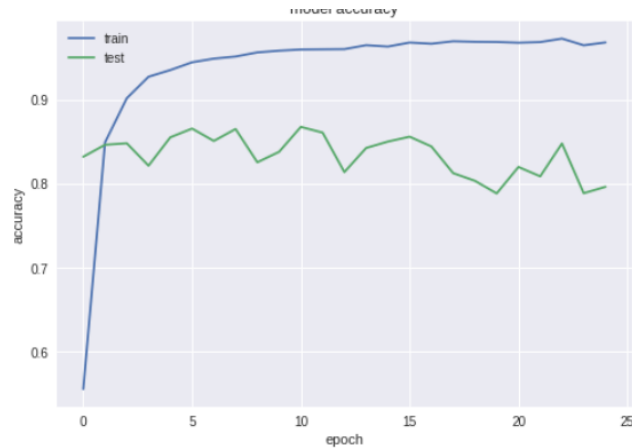My conv model's accuracy. The connection on colab got disconnected after the 182nd epoch but the pattern would have been same till the 200th epoch.

```
Epoch 167/200
9188/9188 [==============================] - 81s 9ms/step - loss: 0.1443 - acc: 0.9518 - val_loss: 0.2270 - val_acc: 0.9386
Epoch 168/200
9188/9188 [==============================] - 81s 9ms/step - loss: 0.1609 - acc: 0.9461 - val_loss: 0.1931 - val_acc: 0.9502
Epoch 169/200
9188/9188 [==============================] - 81s 9ms/step - loss: 0.1116 - acc: 0.9625 - val_loss: 0.2218 - val_acc: 0.9416
Epoch 170/200
9188/9188 [==============================] - 81s 9ms/step - loss: 0.1295 - acc: 0.9536 - val_loss: 0.2316 - val_acc: 0.9368
Epoch 171/200
9188/9188 [==============================] - 81s 9ms/step - loss: 0.1461 - acc: 0.9508 - val_loss: 0.2057 - val_acc: 0.9452
Epoch 172/200
9188/9188 [==============================] - 81s 9ms/step - loss: 0.1633 - acc: 0.9458 - val_loss: 0.2164 - val_acc: 0.9429
Epoch 173/200
9188/9188 [==============================] - 81s 9ms/step - loss: 0.1277 - acc: 0.9574 - val_loss: 0.1746 - val_acc: 0.9472
Epoch 174/200
9188/9188 [==============================] - 81s 9ms/step - loss: 0.1235 - acc: 0.9602 - val_loss: 0.1865 - val_acc: 0.9507
Epoch 175/200
9188/9188 [==============================] - 81s 9ms/step - loss: 0.1331 - acc: 0.9569 - val_loss: 0.1950 - val_acc: 0.9513
Epoch 176/200
9188/9188 [==============================] - 81s 9ms/step - loss: 0.1277 - acc: 0.9580 - val_loss: 0.1925 - val_acc: 0.9497
Epoch 177/200
9188/9188 [==============================] - 81s 9ms/step - loss: 0.1434 - acc: 0.9524 - val_loss: 0.1728 - val_acc: 0.9528
Epoch 178/200
9188/9188 [==============================] - 81s 9ms/step - loss: 0.1202 - acc: 0.9597 - val_loss: 0.2443 - val_acc: 0.9401
Epoch 179/200
9188/9188 [==============================] - 81s 9ms/step - loss: 0.1158 - acc: 0.9626 - val_loss: 0.1953 - val_acc: 0.9520
Epoch 180/200
9188/9188 [==============================] - 81s 9ms/step - loss: 0.1405 - acc: 0.9533 - val_loss: 0.2242 - val_acc: 0.9426
Epoch 181/200
9188/9188 [==============================] - 82s 9ms/step - loss: 0.1378 - acc: 0.9532 - val_loss: 0.2144 - val_acc: 0.9429
Epoch 182/200
8400/9188 [=========================>...] - ETA: 6s - loss: 0.1489 - acc: 0.9525
```
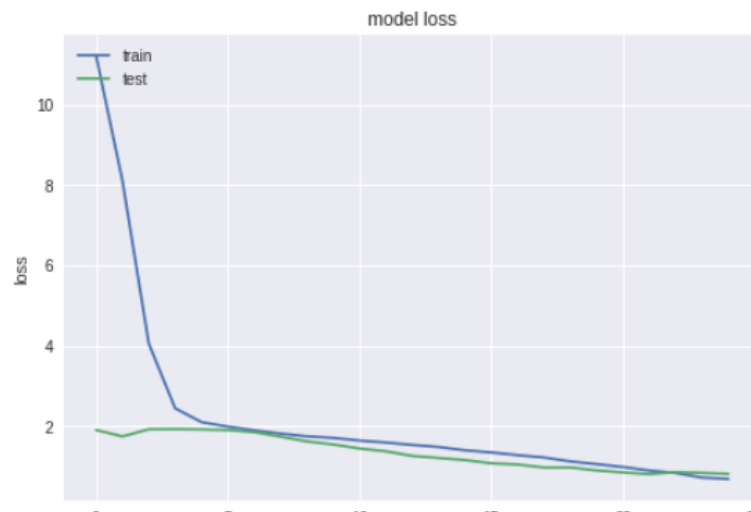
RESNET First Try. Batch size 32, epochs 25, learning rate 0.0001 Adam, training on last 10 layers

model accuracy

model loss

```
Epoch 11/25
9188/9188 [==============================] - 66s 7ms/step - loss: 0.1313 - acc: 0.9598 - val_loss: 0.8674 - val_acc: 0.8677
Epoch 12/25
9188/9188 [==============================] - 66s 7ms/step - loss: 0.1415 - acc: 0.9601 - val_loss: 1.0472 - val_acc: 0.8609
Epoch 13/25
9188/9188 [==============================] - 66s 7ms/step - loss: 0.1612 - acc: 0.9603 - val_loss: 1.4408 - val_acc: 0.8139
Epoch 14/25
9188/9188 [==============================] - 66s 7ms/step - loss: 0.1167 - acc: 0.9650 - val_loss: 1.1302 - val_acc: 0.8426
Epoch 15/25
9188/9188 [==============================] - 66s 7ms/step - loss: 0.1238 - acc: 0.9633 - val_loss: 1.1999 - val_acc: 0.8502
Epoch 16/25
9188/9188 [==============================] - 66s 7ms/step - loss: 0.1118 - acc: 0.9681 - val_loss: 1.0844 - val_acc: 0.8561
Epoch 17/25
9188/9188 [==============================] - 66s 7ms/step - loss: 0.1299 - acc: 0.9667 - val_loss: 1.2893 - val_acc: 0.8444
Epoch 18/25
9188/9188 [==============================] - 66s 7ms/step - loss: 0.1114 - acc: 0.9696 - val_loss: 1.7099 - val_acc: 0.8126
Epoch 19/25
9188/9188 [==============================] - 66s 7ms/step - loss: 0.1042 - acc: 0.9690 - val_loss: 1.7595 - val_acc: 0.8035
Epoch 20/25
9188/9188 [==============================] - 66s 7ms/step - loss: 0.1044 - acc: 0.9688 - val_loss: 1.9518 - val_acc: 0.7885
Epoch 21/25
9188/9188 [==============================] - 66s 7ms/step - loss: 0.1199 - acc: 0.9679 - val_loss: 1.5752 - val_acc: 0.8200
Epoch 22/25
9188/9188 [==============================] - 66s 7ms/step - loss: 0.1054 - acc: 0.9687 - val_loss: 1.7135 - val_acc: 0.8088
Epoch 23/25
9188/9188 [==============================] - 66s 7ms/step - loss: 0.1108 - acc: 0.9728 - val_loss: 1.3021 - val_acc: 0.8479
Epoch 24/25
9188/9188 [==============================] - 66s 7ms/step - loss: 0.1473 - acc: 0.9648 - val_loss: 1.8933 - val_acc: 0.7888
Epoch 25/25
9188/9188 [==============================] - 66s 7ms/step - loss: 0.1153 - acc: 0.9682 - val_loss: 1.8829 - val_acc: 0.7964
```

ResNet Second try 25 epochs batch size 32, learning rate 0.0001 Adam, training on last 10 layers

```
Epoch 17/25
9188/9188 [==============================] - 65s 7ms/step - loss: 1.2755 - acc: 0.5283 - val_loss: 1.0415 - val_acc: 0.6243
Epoch 18/25
9188/9188 [==============================] - 65s 7ms/step - loss: 1.2165 - acc: 0.5526 - val_loss: 0.9672 - val_acc: 0.6507
Epoch 19/25
9188/9188 [==============================] - 65s 7ms/step - loss: 1.1194 - acc: 0.5861 - val_loss: 0.9672 - val_acc: 0.6811
Epoch 20/25
9188/9188 [==============================] - 65s 7ms/step - loss: 1.0511 - acc: 0.6185 - val_loss: 0.8945 - val_acc: 0.7075
Epoch 21/25
9188/9188 [==============================] - 65s 7ms/step - loss: 0.9801 - acc: 0.6529 - val_loss: 0.8440 - val_acc: 0.7220
Epoch 22/25
9188/9188 [==============================] - 65s 7ms/step - loss: 0.8915 - acc: 0.6856 - val_loss: 0.8035 - val_acc: 0.7411
Epoch 23/25
9188/9188 [==============================] - 65s 7ms/step - loss: 0.8307 - acc: 0.7156 - val_loss: 0.8518 - val_acc: 0.7380
Epoch 24/25
9188/9188 [==============================] - 65s 7ms/step - loss: 0.7162 - acc: 0.7541 - val_loss: 0.8329 - val_acc: 0.7456
Epoch 25/25
9188/9188 [==============================] - 65s 7ms/step - loss: 0.6810 - acc: 0.7699 - val_loss: 0.8100 - val_acc: 0.7626
```

ResNet same model run for 50 epochs, will achieve 90+ accuracy on more iterations as loss is constantly

Decreasing. Oscillations are appearing as I changed the learning rate to 0.001 from 0.0001 in previous model. Colab kept on disconnecting on higher epochs otherwise I would have posted the results on them.

```
Epoch 35/50
7948/7948 [==============================] - 56s 7ms/step - loss: 0.4581 - acc: 0.8444 - val_loss: 1.9205 - val_acc: 0.8098
Epoch 36/50
7948/7948 [==============================] - 56s 7ms/step - loss: 0.4491 - acc: 0.8441 - val_loss: 1.6236 - val_acc: 0.8441
Epoch 37/50
7948/7948 [==============================] - 56s 7ms/step - loss: 0.4760 - acc: 0.8333 - val_loss: 0.9973 - val_acc: 0.8462
Epoch 38/50
7948/7948 [==============================] - 56s 7ms/step - loss: 0.4455 - acc: 0.8434 - val_loss: 1.6747 - val_acc: 0.8315
Epoch 39/50
7948/7948 [==============================] - 56s 7ms/step - loss: 0.4279 - acc: 0.8503 - val_loss: 1.4332 - val_acc: 0.8456
Epoch 40/50
7948/7948 [==============================] - 56s 7ms/step - loss: 0.4482 - acc: 0.8476 - val_loss: 2.0119 - val_acc: 0.8186
Epoch 41/50
7948/7948 [==============================] - 56s 7ms/step - loss: 0.4566 - acc: 0.8396 - val_loss: 1.7944 - val_acc: 0.8116
Epoch 42/50
7948/7948 [==============================] - 56s 7ms/step - loss: 0.4885 - acc: 0.8363 - val_loss: 2.3160 - val_acc: 0.7890
Epoch 43/50
7948/7948 [==============================] - 56s 7ms/step - loss: 0.5008 - acc: 0.8317 - val_loss: 1.9458 - val_acc: 0.8116
Epoch 44/50
7948/7948 [==============================] - 56s 7ms/step - loss: 0.4663 - acc: 0.8397 - val_loss: 1.8783 - val_acc: 0.8201
Epoch 45/50
7948/7948 [==============================] - 56s 7ms/step - loss: 0.4608 - acc: 0.8463 - val_loss: 1.3822 - val_acc: 0.8556
Epoch 46/50
7948/7948 [==============================] - 56s 7ms/step - loss: 0.4302 - acc: 0.8543 - val_loss: 1.3599 - val_acc: 0.8576
Epoch 47/50
7948/7948 [==============================] - 56s 7ms/step - loss: 0.4198 - acc: 0.8529 - val_loss: 1.9192 - val_acc: 0.8309
Epoch 48/50
7948/7948 [==============================] - 56s 7ms/step - loss: 0.4466 - acc: 0.8426 - val_loss: 1.8228 - val_acc: 0.8268
Epoch 49/50
7948/7948 [==============================] - 56s 7ms/step - loss: 0.4528 - acc: 0.8437 - val_loss: 1.4955 - val_acc: 0.8336
Epoch 50/50
7948/7948 [==============================] - 56s 7ms/step - loss: 0.4199 - acc: 0.8512 - val_loss: 1.7457 - val_acc: 0.8333
```

model accuracy

Text(0,0.5,'loss')

model loss