**DenseNet121,** training batch size=**128**, testing bs=**128,** optimizer=**SGD, lr=0.02**, **epoch=40**

+ RandomHorizontalFlip() + RandomCrop(32, padding=4)

epoch 1, loss 1.2975, train acc 0.480, test acc 0.430, time 134.7 sec

epoch 2, loss 0.2583, train acc 0.821, test acc 0.609, time 137.5 sec

epoch 3, loss 0.0984, train acc 0.905, test acc 0.643, time 139.5 sec

epoch 4, loss 0.0595, train acc 0.924, test acc 0.667, time 142.4 sec

epoch 5, loss 0.0424, train acc 0.933, test acc 0.678, time 142.9 sec

epoch 6, loss 0.0321, train acc 0.940, test acc 0.671, time 144.1 sec

epoch 7, loss 0.0258, train acc 0.944, test acc 0.682, time 144.2 sec

epoch 8, loss 0.0212, train acc 0.948, test acc 0.677, time 145.2 sec

epoch 9, loss 0.0180, train acc 0.950, test acc 0.685, time 145.4 sec

epoch 10, loss 0.0154, train acc 0.953, test acc 0.678, time 145.7 sec

epoch 11, loss 0.0135, train acc 0.954, test acc 0.690, time 146.5 sec

epoch 12, loss 0.0119, train acc 0.957, test acc 0.681, time 145.7 sec

epoch 13, loss 0.0108, train acc 0.957, test acc 0.687, time 145.2 sec

epoch 14, loss 0.0095, train acc 0.959, test acc 0.688, time 145.9 sec

epoch 15, loss 0.0088, train acc 0.959, test acc 0.682, time 145.8 sec

epoch 16, loss 0.0079, train acc 0.961, test acc 0.682, time 145.8 sec

epoch 17, loss 0.0074, train acc 0.961, test acc 0.677, time 145.5 sec

epoch 18, loss 0.0070, train acc 0.961, test acc 0.685, time 145.7 sec

epoch 19, loss 0.0063, train acc 0.964, test acc 0.675, time 145.7 sec

epoch 20, loss 0.0058, train acc 0.964, test acc 0.680, time 145.8 sec

epoch 21, loss 0.0056, train acc 0.964, test acc 0.687, time 145.0 sec

epoch 22, loss 0.0052, train acc 0.965, test acc 0.687, time 145.9 sec

epoch 23, loss 0.0050, train acc 0.965, test acc 0.687, time 145.6 sec

epoch 24, loss 0.0046, train acc 0.966, test acc 0.669, time 145.7 sec

epoch 25, loss 0.0043, train acc 0.968, test acc 0.687, time 146.0 sec

epoch 26, loss 0.0043, train acc 0.967, test acc 0.672, time 145.7 sec

epoch 27, loss 0.0040, train acc 0.966, test acc 0.673, time 146.0 sec

epoch 28, loss 0.0038, train acc 0.968, test acc 0.688, time 145.7 sec

epoch 29, loss 0.0036, train acc 0.968, test acc 0.686, time 145.4 sec

epoch 30, loss 0.0035, train acc 0.969, test acc 0.668, time 146.1 sec

epoch 31, loss 0.0033, train acc 0.969, test acc 0.690, time 145.5 sec

epoch 32, loss 0.0034, train acc 0.967, test acc 0.683, time 145.8 sec

epoch 33, loss 0.0032, train acc 0.968, test acc 0.684, time 145.4 sec

epoch 34, loss 0.0030, train acc 0.969, test acc 0.685, time 145.5 sec

epoch 35, loss 0.0029, train acc 0.969, test acc 0.688, time 145.5 sec

epoch 36, loss 0.0029, train acc 0.968, test acc 0.691, time 145.6 sec

epoch 37, loss 0.0027, train acc 0.970, test acc 0.692, time 145.2 sec

epoch 38, loss 0.0026, train acc 0.970, test acc 0.687, time 145.3 sec

epoch 39, loss 0.0025, train acc 0.970, test acc 0.693, time 145.1 sec

epoch 40, loss 0.0024, train acc 0.971, test acc 0.690, time 145.3 sec

Validation: Accuracy of the network: 95.06125574272588 %

OOD accuracy without the "unknown" label: Accuracy of the network: 68.99969268592501 %

threshold is 0.00:

Threshold accuracy: 69.326 %

Brier before calibration: 0.44673943115469217

ECE before calibration: 0.22266769116102145

calibrating...

Brier temperature\_scaling calibration: 0.3757595885450098

ECE temperature\_scaling calibration: 0.15814183662475506

threshold is 0.05:

Threshold accuracy: 69.326 %

Brier before calibration: 0.44673943115469217

ECE before calibration: 0.22266769116102145

calibrating...

Brier temperature\_scaling calibration: 0.3757595885450098

ECE temperature\_scaling calibration: 0.15814183662475506

threshold is 0.10:

Threshold accuracy: 69.326 %

Brier before calibration: 0.44673943115469217

ECE before calibration: 0.22266769116102145

calibrating...

Brier temperature\_scaling calibration: 0.3757595885450098

ECE temperature\_scaling calibration: 0.15814183662475506

threshold is 0.15:

Threshold accuracy: 69.326 %

Brier before calibration: 0.44673943115469217

ECE before calibration: 0.22266769116102145

calibrating...

Brier temperature\_scaling calibration: 0.3757595885450098

ECE temperature\_scaling calibration: 0.15814183662475506

threshold is 0.20:

Threshold accuracy: 69.326 %

Brier before calibration: 0.44673943115469217

ECE before calibration: 0.22266769116102145

calibrating...

Brier temperature\_scaling calibration: 0.3757595885450098

ECE temperature\_scaling calibration: 0.15814183662475506

threshold is 0.25:

Threshold accuracy: 69.326 %

Brier before calibration: 0.44673943115469217

ECE before calibration: 0.22266769116102145

calibrating...

Brier temperature\_scaling calibration: 0.3757595885450098

ECE temperature\_scaling calibration: 0.15814183662475506

threshold is 0.30:

Threshold accuracy: 69.326 %

Brier before calibration: 0.44673943115469217

ECE before calibration: 0.22266769116102145

calibrating...

Brier temperature\_scaling calibration: 0.3757595885450098

ECE temperature\_scaling calibration: 0.15814183662475506

threshold is 0.35:

Threshold accuracy: 69.634 %

Brier before calibration: 0.44673943115469217

ECE before calibration: 0.22449969204936057

calibrating...

Brier temperature\_scaling calibration: 0.3757595885450098

ECE temperature\_scaling calibration: 0.162745534384551

threshold is 0.40:

Threshold accuracy: 70.394 %

Brier before calibration: 0.44673943115469217

ECE before calibration: 0.22657274306003636

calibrating...

Brier temperature\_scaling calibration: 0.3757595885450098

ECE temperature\_scaling calibration: 0.16707400409888287

threshold is 0.45:

Threshold accuracy: 71.378 %

Brier before calibration: 0.44673943115469217

ECE before calibration: 0.22900978992816193

calibrating...

Brier temperature\_scaling calibration: 0.3757595885450098

ECE temperature\_scaling calibration: 0.17124092488331555

threshold is 0.50:

Threshold accuracy: 72.434 %

Brier before calibration: 0.44673943115469217

ECE before calibration: 0.23127585605528722

calibrating...

Brier temperature\_scaling calibration: 0.3757595885450098

ECE temperature\_scaling calibration: 0.17447678493959773

threshold is 0.55:

Threshold accuracy: 73.609 %

Brier before calibration: 0.44673943115469217

ECE before calibration: 0.23293723764050275

calibrating...

Brier temperature\_scaling calibration: 0.3757595885450098

ECE temperature\_scaling calibration: 0.1767286588784167

threshold is 0.60:

Threshold accuracy: 74.800 %

Brier before calibration: 0.44673943115469217

ECE before calibration: 0.23351118384363023

calibrating...

Brier temperature\_scaling calibration: 0.3757595885450098

ECE temperature\_scaling calibration: 0.17819143518617747

threshold is 0.65:

Threshold accuracy: 75.957 %

Brier before calibration: 0.44673943115469217

ECE before calibration: 0.23335097154079215

calibrating...

Brier temperature\_scaling calibration: 0.3757595885450098

ECE temperature\_scaling calibration: 0.1791905060412789

threshold is 0.70:

Threshold accuracy: 77.101 %

Brier before calibration: 0.44673943115469217

ECE before calibration: 0.23316541271995161

calibrating...

Brier temperature\_scaling calibration: 0.3757595885450098

ECE temperature\_scaling calibration: 0.18006627683052084

threshold is 0.75:

Threshold accuracy: 78.265 %

Brier before calibration: 0.44673943115469217

ECE before calibration: 0.2323495878642808

calibrating...

Brier temperature\_scaling calibration: 0.3757595885450098

ECE temperature\_scaling calibration: 0.180357228972581

threshold is 0.80:

Threshold accuracy: 79.375 %

Brier before calibration: 0.44673943115469217

ECE before calibration: 0.2316923135617941

calibrating...

Brier temperature\_scaling calibration: 0.3757595885450098

ECE temperature\_scaling calibration: 0.17995433351935125

threshold is 0.85:

Threshold accuracy: 80.409 %

Brier before calibration: 0.44673943115469217

ECE before calibration: 0.2305878945926837

calibrating...

Brier temperature\_scaling calibration: 0.3757595885450098

ECE temperature\_scaling calibration: 0.1792738672584002

threshold is 0.90:

Threshold accuracy: 81.653 %

Brier before calibration: 0.44673943115469217

ECE before calibration: 0.2288294905303223

calibrating...

Brier temperature\_scaling calibration: 0.3757595885450098

ECE temperature\_scaling calibration: 0.17831090297011887

threshold is 0.95:

Threshold accuracy: 82.518 %

Brier before calibration: 0.44673943115469217

ECE before calibration: 0.22580239475322925

calibrating...

Brier temperature\_scaling calibration: 0.3757595885450098

ECE temperature\_scaling calibration: 0.17714477850315427