**DenseNet121,** training batch size=**128**, testing bs=**128,** optimizer=**SGD, lr=0.02**, **epoch=60**

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

epoch 1, loss 1.6658, train acc 0.306, test acc 0.138, time 57.9 sec

epoch 2, loss 0.6240, train acc 0.481, test acc 0.365, time 57.4 sec

epoch 3, loss 0.2819, train acc 0.673, test acc 0.421, time 57.9 sec

epoch 4, loss 0.1429, train acc 0.797, test acc 0.553, time 59.0 sec

epoch 5, loss 0.0774, train acc 0.871, test acc 0.629, time 60.0 sec

epoch 6, loss 0.0497, train acc 0.901, test acc 0.629, time 61.1 sec

epoch 7, loss 0.0371, train acc 0.916, test acc 0.652, time 61.0 sec

epoch 8, loss 0.0297, train acc 0.925, test acc 0.664, time 61.4 sec

epoch 9, loss 0.0241, train acc 0.931, test acc 0.664, time 61.5 sec

epoch 10, loss 0.0205, train acc 0.936, test acc 0.676, time 61.4 sec

epoch 11, loss 0.0177, train acc 0.939, test acc 0.671, time 68.3 sec

epoch 12, loss 0.0158, train acc 0.940, test acc 0.675, time 86.5 sec

epoch 13, loss 0.0136, train acc 0.944, test acc 0.688, time 62.0 sec

epoch 14, loss 0.0124, train acc 0.947, test acc 0.678, time 62.0 sec

epoch 15, loss 0.0113, train acc 0.947, test acc 0.681, time 62.3 sec

epoch 16, loss 0.0101, train acc 0.950, test acc 0.686, time 62.6 sec

epoch 17, loss 0.0093, train acc 0.950, test acc 0.682, time 62.0 sec

epoch 18, loss 0.0085, train acc 0.953, test acc 0.685, time 70.1 sec

epoch 19, loss 0.0080, train acc 0.953, test acc 0.689, time 62.4 sec

epoch 20, loss 0.0075, train acc 0.954, test acc 0.685, time 79.4 sec

epoch 21, loss 0.0069, train acc 0.955, test acc 0.678, time 62.4 sec

epoch 22, loss 0.0065, train acc 0.956, test acc 0.679, time 62.3 sec

epoch 23, loss 0.0061, train acc 0.956, test acc 0.683, time 62.3 sec

epoch 24, loss 0.0058, train acc 0.957, test acc 0.688, time 62.0 sec

epoch 25, loss 0.0054, train acc 0.959, test acc 0.690, time 62.3 sec

epoch 26, loss 0.0052, train acc 0.959, test acc 0.691, time 62.2 sec

epoch 27, loss 0.0049, train acc 0.960, test acc 0.684, time 70.3 sec

epoch 28, loss 0.0048, train acc 0.959, test acc 0.687, time 62.4 sec

epoch 29, loss 0.0045, train acc 0.960, test acc 0.689, time 62.4 sec

epoch 30, loss 0.0042, train acc 0.962, test acc 0.678, time 63.1 sec

epoch 31, loss 0.0041, train acc 0.962, test acc 0.684, time 62.2 sec

epoch 32, loss 0.0040, train acc 0.961, test acc 0.689, time 61.8 sec

epoch 33, loss 0.0038, train acc 0.962, test acc 0.690, time 61.3 sec

epoch 34, loss 0.0036, train acc 0.964, test acc 0.689, time 62.0 sec

epoch 35, loss 0.0034, train acc 0.964, test acc 0.694, time 62.2 sec

epoch 36, loss 0.0034, train acc 0.963, test acc 0.683, time 62.2 sec

epoch 37, loss 0.0032, train acc 0.965, test acc 0.690, time 62.1 sec

epoch 38, loss 0.0031, train acc 0.965, test acc 0.680, time 62.3 sec

epoch 39, loss 0.0030, train acc 0.964, test acc 0.689, time 62.3 sec

epoch 40, loss 0.0029, train acc 0.965, test acc 0.691, time 62.1 sec

Validation: Accuracy of the network: 94.52526799387442 %

OOD accuracy without the "unknown" label: Accuracy of the network: 69.1379840196681 %

threshold is 0.00:

Threshold accuracy: 69.330 %

Brier before calibration: 0.43375588932460823

ECE before calibration: 0.21375364046852935

calibrating...

Brier temperature\_scaling calibration: 0.4060780159542271

ECE temperature\_scaling calibration: 0.1930862059238577

threshold is 0.05:

Threshold accuracy: 69.330 %

Brier before calibration: 0.43375588932460823

ECE before calibration: 0.21375364046852935

calibrating...

Brier temperature\_scaling calibration: 0.4060780159542271

ECE temperature\_scaling calibration: 0.1930862059238577

threshold is 0.10:

Threshold accuracy: 69.330 %

Brier before calibration: 0.43375588932460823

ECE before calibration: 0.21375364046852935

calibrating...

Brier temperature\_scaling calibration: 0.4060780159542271

ECE temperature\_scaling calibration: 0.1930862059238577

threshold is 0.15:

Threshold accuracy: 69.330 %

Brier before calibration: 0.43375588932460823

ECE before calibration: 0.21375364046852935

calibrating...

Brier temperature\_scaling calibration: 0.4060780159542271

ECE temperature\_scaling calibration: 0.1930862059238577

threshold is 0.20:

Threshold accuracy: 69.330 %

Brier before calibration: 0.43375588932460823

ECE before calibration: 0.21375364046852935

calibrating...

Brier temperature\_scaling calibration: 0.4060780159542271

ECE temperature\_scaling calibration: 0.1930862059238577

threshold is 0.25:

Threshold accuracy: 69.330 %

Brier before calibration: 0.43375588932460823

ECE before calibration: 0.21375364046852935

calibrating...

Brier temperature\_scaling calibration: 0.4060780159542271

ECE temperature\_scaling calibration: 0.1930862059238577

threshold is 0.30:

Threshold accuracy: 69.330 %

Brier before calibration: 0.43375588932460823

ECE before calibration: 0.21375364046852935

calibrating...

Brier temperature\_scaling calibration: 0.4060780159542271

ECE temperature\_scaling calibration: 0.1930862059238577

threshold is 0.35:

Threshold accuracy: 69.587 %

Brier before calibration: 0.43375588932460823

ECE before calibration: 0.2156781490844088

calibrating...

Brier temperature\_scaling calibration: 0.4060780159542271

ECE temperature\_scaling calibration: 0.19580081348852943

threshold is 0.40:

Threshold accuracy: 70.386 %

Brier before calibration: 0.43375588932460823

ECE before calibration: 0.2179377256321921

calibrating...

Brier temperature\_scaling calibration: 0.4060780159542271

ECE temperature\_scaling calibration: 0.19842282291123967

threshold is 0.45:

Threshold accuracy: 71.385 %

Brier before calibration: 0.43375588932460823

ECE before calibration: 0.22020650012550277

calibrating...

Brier temperature\_scaling calibration: 0.4060780159542271

ECE temperature\_scaling calibration: 0.20224711788015712

threshold is 0.50:

Threshold accuracy: 72.764 %

Brier before calibration: 0.43375588932460823

ECE before calibration: 0.22318773688754195

calibrating...

Brier temperature\_scaling calibration: 0.4060780159542271

ECE temperature\_scaling calibration: 0.2053495766967077

threshold is 0.55:

Threshold accuracy: 73.963 %

Brier before calibration: 0.43375588932460823

ECE before calibration: 0.22488556160249804

calibrating...

Brier temperature\_scaling calibration: 0.4060780159542271

ECE temperature\_scaling calibration: 0.20729123117298015

threshold is 0.60:

Threshold accuracy: 75.300 %

Brier before calibration: 0.43375588932460823

ECE before calibration: 0.2258221708929604

calibrating...

Brier temperature\_scaling calibration: 0.4060780159542271

ECE temperature\_scaling calibration: 0.2086316526632186

threshold is 0.65:

Threshold accuracy: 76.444 %

Brier before calibration: 0.43375588932460823

ECE before calibration: 0.22652069747118248

calibrating...

Brier temperature\_scaling calibration: 0.4060780159542271

ECE temperature\_scaling calibration: 0.20907268395215803

threshold is 0.70:

Threshold accuracy: 77.681 %

Brier before calibration: 0.43375588932460823

ECE before calibration: 0.22630770190332145

calibrating...

Brier temperature\_scaling calibration: 0.4060780159542271

ECE temperature\_scaling calibration: 0.20939647015722235

threshold is 0.75:

Threshold accuracy: 78.703 %

Brier before calibration: 0.43375588932460823

ECE before calibration: 0.2259040671619961

calibrating...

Brier temperature\_scaling calibration: 0.4060780159542271

ECE temperature\_scaling calibration: 0.20913119805540567

threshold is 0.80:

Threshold accuracy: 79.825 %

Brier before calibration: 0.43375588932460823

ECE before calibration: 0.22486546146554595

calibrating...

Brier temperature\_scaling calibration: 0.4060780159542271

ECE temperature\_scaling calibration: 0.208363616254041

threshold is 0.85:

Threshold accuracy: 80.977 %

Brier before calibration: 0.43375588932460823

ECE before calibration: 0.22403508208614217

calibrating...

Brier temperature\_scaling calibration: 0.4060780159542271

ECE temperature\_scaling calibration: 0.20720002104624988

threshold is 0.90:

Threshold accuracy: 82.341 %

Brier before calibration: 0.43375588932460823

ECE before calibration: 0.22199079341220204

calibrating...

Brier temperature\_scaling calibration: 0.4060780159542271

ECE temperature\_scaling calibration: 0.20640459043084292

threshold is 0.95:

Threshold accuracy: 83.417 %

Brier before calibration: 0.43375588932460823

ECE before calibration: 0.21999307431981255

calibrating...

Brier temperature\_scaling calibration: 0.4060780159542271

ECE temperature\_scaling calibration: 0.2048958911438551