/opt/miniconda3/envs/cs178/bin/python   /Users/hongqushi/UCI-data science/CS178/178project/Untitled2.py
Tensorflow version: 2.9.1
Keras version: 2.9.0
(50000, 32, 32, 3) (50000, 1) (10000, 32, 32, 3) (10000, 1)
2022-12-06 15:30:59.031504: I tensorflow/core/platform/cpu_feature_guard.cc:193] This TensorFlow binary is optimized with oneAPI Deep Neural Network Library (oneDNN) to use the following CPU instructions in performance-critical operations: SSE4.1 SSE4.2 AVX AVX2 FMA
To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.
Model: "sequential"

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Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 29, 29, 32)	1568
max_pooling2d (MaxPooling2D)	(None, 14, 14, 32)	0
conv2d_1 (Conv2D)	(None, 11, 11, 32)	16416
max_pooling2d_1 (MaxPooling2D)	(None, 5, 5, 32)	0
flatten (Flatten)	(None, 800)	0
dense (Dense)	(None, 128)	102528
dense_1 (Dense)	(None, 10)	1290

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Total params: 121,802
Trainable params: 121,802
Non-trainable params: 0
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Epoch 1/20
1250/1250 [==============================] - 25s 20ms/step - loss: 1.6237 - accuracy: 0.4086 - val_loss: 1.3703 - val_accuracy: 0.5088
Epoch 2/20
1250/1250 [==============================] - 23s 19ms/step - loss: 1.3011 - accuracy: 0.5347 - val_loss: 1.2298 - val_accuracy: 0.5680
Epoch 3/20

1250/1250 [==============================] - 26s 20ms/step - loss: 1.1608 - accuracy: 0.5900 - val_loss: 1.2338 - val_accuracy: 0.5692
Epoch 4/20
1250/1250 [==============================] - 22s 18ms/step - loss: 1.0646 - accuracy: 0.6268 - val_loss: 1.1207 - val_accuracy: 0.6066
Epoch 5/20
1250/1250 [==============================] - 22s 17ms/step - loss: 0.9942 - accuracy: 0.6528 - val_loss: 1.0461 - val_accuracy: 0.6381
Epoch 6/20
1250/1250 [==============================] - 22s 17ms/step - loss: 0.9313 - accuracy: 0.6738 - val_loss: 1.0420 - val_accuracy: 0.6368
Epoch 7/20
1250/1250 [==============================] - 22s 17ms/step - loss: 0.8795 - accuracy: 0.6931 - val_loss: 1.0402 - val_accuracy: 0.6406
Epoch 8/20
1250/1250 [==============================] - 23s 18ms/step - loss: 0.8365 - accuracy: 0.7082 - val_loss: 1.0458 - val_accuracy: 0.6435
Epoch 9/20
1250/1250 [==============================] - 23s 18ms/step - loss: 0.7960 - accuracy: 0.7209 - val_loss: 0.9900 - val_accuracy: 0.6605
Epoch 10/20
1250/1250 [==============================] - 25s 20ms/step - loss: 0.7598 - accuracy: 0.7340 - val_loss: 1.0296 - val_accuracy: 0.6561
Epoch 11/20
1250/1250 [==============================] - 25s 20ms/step - loss: 0.7211 - accuracy: 0.7493 - val_loss: 1.0103 - val_accuracy: 0.6640
Epoch 12/20
1250/1250 [==============================] - 24s 19ms/step - loss: 0.6916 - accuracy: 0.7552 - val_loss: 0.9802 - val_accuracy: 0.6745
Epoch 13/20
1250/1250 [==============================] - 25s 20ms/step - loss: 0.6539 - accuracy: 0.7708 - val_loss: 1.0280 - val_accuracy: 0.6727
Epoch 14/20
1250/1250 [==============================] - 21s 17ms/step - loss: 0.6214 - accuracy: 0.7810 - val_loss: 1.0447 - val_accuracy: 0.6623
Epoch 15/20
1250/1250 [==============================] - 22s 17ms/step - loss: 0.5948 - accuracy: 0.7894 - val_loss: 1.0585 - val_accuracy: 0.6727
Epoch 16/20
1250/1250 [==============================] - 22s 18ms/step - loss: 0.5588 - accuracy: 0.8040 - val_loss: 1.1311 - val_accuracy: 0.6564
Epoch 17/20
1250/1250 [==============================] - 22s 18ms/step - loss: 0.5398 - accuracy: 0.8101 - val_loss: 1.1534 - val_accuracy: 0.6585

Epoch 18/20

1250/1250 [==============================] - 22s 17ms/step - loss: 0.5131 - accuracy: 0.8156 - val_loss: 1.1619 - val_accuracy: 0.6614

Epoch 19/20

1250/1250 [==============================] - 22s 17ms/step - loss: 0.4863 - accuracy: 0.8286 - val_loss: 1.1416 - val_accuracy: 0.6644

Epoch 20/20

1250/1250 [==============================] - 22s 18ms/step - loss: 0.4565 - accuracy: 0.8384 - val_loss: 1.2114 - val_accuracy: 0.6629

Model: "sequential"

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Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 29, 29, 32)	1568
max_pooling2d (MaxPooling2D)	(None, 14, 14, 32)	0
conv2d_1 (Conv2D)	(None, 11, 11, 32)	16416
max_pooling2d_1 (MaxPooling2D)	(None, 5, 5, 32)	0
flatten (Flatten)	(None, 800)	0
dense (Dense)	(None, 128)	102528
dense_1 (Dense)	(None, 10)	1290

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Total params: 121,802

Trainable params: 121,802

Non-trainable params: 0

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Epoch 1/20

1250/1250 [==============================] - 23s 19ms/step - loss: 0.4370 - accuracy: 0.8453 - val_loss: 1.2957 - val_accuracy: 0.6526

Epoch 2/20

1250/1250 [==============================] - 21s 17ms/step - loss: 0.4103 - accuracy: 0.8543 - val_loss: 1.3333 - val_accuracy: 0.6502

Epoch 3/20

1250/1250 [==============================] - 21s 17ms/step - loss: 0.3937 -

accuracy: 0.8613 - val_loss: 1.3750 - val_accuracy: 0.6518

Epoch 4/20

1250/1250 [==============================] - 21s 17ms/step - loss: 0.3661 - accuracy: 0.8696 - val_loss: 1.4381 - val_accuracy: 0.6523

Epoch 5/20

1250/1250 [==============================] - 21s 17ms/step - loss: 0.3577 - accuracy: 0.8723 - val_loss: 1.4626 - val_accuracy: 0.6430

Epoch 6/20

1250/1250 [==============================] - 22s 17ms/step - loss: 0.3383 - accuracy: 0.8803 - val_loss: 1.5835 - val_accuracy: 0.6352

Epoch 7/20

1250/1250 [==============================] - 22s 17ms/step - loss: 0.3136 - accuracy: 0.8877 - val_loss: 1.6568 - val_accuracy: 0.6379

Epoch 8/20

1250/1250 [==============================] - 20s 16ms/step - loss: 0.2997 - accuracy: 0.8921 - val_loss: 1.6962 - val_accuracy: 0.6446

Epoch 9/20

1250/1250 [==============================] - 20s 16ms/step - loss: 0.2848 - accuracy: 0.8976 - val_loss: 1.7233 - val_accuracy: 0.6440

Epoch 10/20

1250/1250 [==============================] - 21s 17ms/step - loss: 0.2728 - accuracy: 0.9039 - val_loss: 1.8312 - val_accuracy: 0.6403

Epoch 11/20

1250/1250 [==============================] - 22s 17ms/step - loss: 0.2656 - accuracy: 0.9043 - val_loss: 1.9120 - val_accuracy: 0.6342

Epoch 12/20

1250/1250 [==============================] - 20s 16ms/step - loss: 0.2436 - accuracy: 0.9137 - val_loss: 1.9794 - val_accuracy: 0.6316

Epoch 13/20

1250/1250 [==============================] - 20s 16ms/step - loss: 0.2358 - accuracy: 0.9155 - val_loss: 1.9473 - val_accuracy: 0.6493

Epoch 14/20

1250/1250 [==============================] - 20s 16ms/step - loss: 0.2241 - accuracy: 0.9194 - val_loss: 2.0650 - val_accuracy: 0.6343

Epoch 15/20

1250/1250 [==============================] - 20s 16ms/step - loss: 0.2184 - accuracy: 0.9224 - val_loss: 2.2224 - val_accuracy: 0.6235

Epoch 16/20

1250/1250 [==============================] - 20s 16ms/step - loss: 0.2099 - accuracy: 0.9254 - val_loss: 2.2669 - val_accuracy: 0.6246

Epoch 17/20

1250/1250 [==============================] - 22s 18ms/step - loss: 0.1963 - accuracy: 0.9295 - val_loss: 2.2108 - val_accuracy: 0.6281

Epoch 18/20

1250/1250 [==============================] - 21s 17ms/step - loss: 0.1919 - accuracy: 0.9307 - val_loss: 2.3292 - val_accuracy: 0.6344
Epoch 19/20
1250/1250 [==============================] - 20s 16ms/step - loss: 0.1881 - accuracy: 0.9315 - val_loss: 2.3796 - val_accuracy: 0.6331
Epoch 20/20
1250/1250 [==============================] - 20s 16ms/step - loss: 0.1803 - accuracy: 0.9361 - val_loss: 2.4590 - val_accuracy: 0.6318
Model: "sequential"

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Layer (type)	Output Shape	Param #
conv2d (Conv2D)	(None, 29, 29, 32)	1568
max_pooling2d (MaxPooling2D)	(None, 14, 14, 32)	0
conv2d_1 (Conv2D)	(None, 11, 11, 32)	16416
max_pooling2d_1 (MaxPooling 2D)	(None, 5, 5, 32)	0
flatten (Flatten)	(None, 800)	0
dense (Dense)	(None, 128)	102528
dense_1 (Dense)	(None, 10)	1290

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Total params: 121,802
Trainable params: 121,802
Non-trainable params: 0

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Epoch 1/20
1250/1250 [==============================] - 20s 16ms/step - loss: 0.1728 - accuracy: 0.9373 - val_loss: 2.5048 - val_accuracy: 0.6364
Epoch 2/20
1250/1250 [==============================] - 20s 16ms/step - loss: 0.1758 - accuracy: 0.9353 - val_loss: 2.4286 - val_accuracy: 0.6428
Epoch 3/20
1250/1250 [==============================] - 20s 16ms/step - loss: 0.1631 - accuracy: 0.9426 - val_loss: 2.5135 - val_accuracy: 0.6390

Epoch 4/20
1250/1250 [==============================] - 20s 16ms/step - loss: 0.1544 - accuracy: 0.9440 - val_loss: 2.5896 - val_accuracy: 0.6329
Epoch 5/20
1250/1250 [==============================] - 21s 17ms/step - loss: 0.1484 - accuracy: 0.9470 - val_loss: 2.6275 - val_accuracy: 0.6413
Epoch 6/20
1250/1250 [==============================] - 21s 17ms/step - loss: 0.1518 - accuracy: 0.9457 - val_loss: 2.7124 - val_accuracy: 0.6329
Epoch 7/20
1250/1250 [==============================] - 20s 16ms/step - loss: 0.1351 - accuracy: 0.9518 - val_loss: 2.8343 - val_accuracy: 0.6261
Epoch 8/20
1250/1250 [==============================] - 20s 16ms/step - loss: 0.1475 - accuracy: 0.9481 - val_loss: 2.9889 - val_accuracy: 0.6277
Epoch 9/20
1250/1250 [==============================] - 20s 16ms/step - loss: 0.1465 - accuracy: 0.9477 - val_loss: 2.8399 - val_accuracy: 0.6416
Epoch 10/20
1250/1250 [==============================] - 20s 16ms/step - loss: 0.1284 - accuracy: 0.9540 - val_loss: 2.9884 - val_accuracy: 0.6341
Epoch 11/20
1250/1250 [==============================] - 20s 16ms/step - loss: 0.1331 - accuracy: 0.9531 - val_loss: 3.0614 - val_accuracy: 0.6368
Epoch 12/20
1250/1250 [==============================] - 20s 16ms/step - loss: 0.1246 - accuracy: 0.9572 - val_loss: 3.0299 - val_accuracy: 0.6376
Epoch 13/20
1250/1250 [==============================] - 20s 16ms/step - loss: 0.1246 - accuracy: 0.9553 - val_loss: 3.3177 - val_accuracy: 0.6199
Epoch 14/20
1250/1250 [==============================] - 20s 16ms/step - loss: 0.1176 - accuracy: 0.9581 - val_loss: 3.1802 - val_accuracy: 0.6357
Epoch 15/20
1250/1250 [==============================] - 21s 17ms/step - loss: 0.1229 - accuracy: 0.9578 - val_loss: 3.1920 - val_accuracy: 0.6313
Epoch 16/20
1250/1250 [==============================] - 24s 19ms/step - loss: 0.1234 - accuracy: 0.9574 - val_loss: 3.2639 - val_accuracy: 0.6276
Epoch 17/20
1250/1250 [==============================] - 24s 19ms/step - loss: 0.1179 - accuracy: 0.9574 - val_loss: 3.3902 - val_accuracy: 0.6323
Epoch 18/20
1250/1250 [==============================] - 25s 20ms/step - loss: 0.1116 -

accuracy: 0.9607 - val_loss: 3.2582 - val_accuracy: 0.6339
Epoch 19/20
1250/1250 [==============================] - 23s 18ms/step - loss: 0.1247 - accuracy: 0.9582 - val_loss: 3.4188 - val_accuracy: 0.6326
Epoch 20/20
1250/1250 [==============================] - 23s 18ms/step - loss: 0.1122 - accuracy: 0.9603 - val_loss: 3.4203 - val_accuracy: 0.6295
Model: "sequential_1"

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Layer (type)	Output Shape	Param #
conv2d_2 (Conv2D)	(None, 29, 29, 64)	3136
max_pooling2d_2 (MaxPooling 2D)	(None, 14, 14, 64)	0
dropout (Dropout)	(None, 14, 14, 64)	0
conv2d_3 (Conv2D)	(None, 11, 11, 64)	65600
max_pooling2d_3 (MaxPooling 2D)	(None, 5, 5, 64)	0
dropout_1 (Dropout)	(None, 5, 5, 64)	0
flatten_1 (Flatten)	(None, 1600)	0
dense_2 (Dense)	(None, 256)	409856
dense_3 (Dense)	(None, 10)	2570

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Total params: 481,162
Trainable params: 481,162
Non-trainable params: 0

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Epoch 1/20
1250/1250 [==============================] - 50s 39ms/step - loss: 1.5984 - accuracy: 0.4171 - val_loss: 1.4195 - val_accuracy: 0.4961
Epoch 2/20
1250/1250 [==============================] - 51s 40ms/step - loss: 1.2871 - accuracy: 0.5405 - val_loss: 1.1712 - val_accuracy: 0.5921

Epoch 3/20
1250/1250 [==============================] - 53s 43ms/step - loss: 1.1617 - accuracy: 0.5889 - val_loss: 1.1103 - val_accuracy: 0.6138
Epoch 4/20
1250/1250 [==============================] - 57s 46ms/step - loss: 1.0647 - accuracy: 0.6227 - val_loss: 1.0738 - val_accuracy: 0.6288
Epoch 5/20
1250/1250 [==============================] - 56s 45ms/step - loss: 0.9923 - accuracy: 0.6512 - val_loss: 0.9870 - val_accuracy: 0.6555
Epoch 6/20
1250/1250 [==============================] - 55s 44ms/step - loss: 0.9323 - accuracy: 0.6736 - val_loss: 0.9776 - val_accuracy: 0.6595
Epoch 7/20
1250/1250 [==============================] - 48s 38ms/step - loss: 0.8719 - accuracy: 0.6924 - val_loss: 0.9309 - val_accuracy: 0.6775
Epoch 8/20
1250/1250 [==============================] - 49s 40ms/step - loss: 0.8360 - accuracy: 0.7042 - val_loss: 0.9525 - val_accuracy: 0.6727
Epoch 9/20
1250/1250 [==============================] - 49s 39ms/step - loss: 0.7865 - accuracy: 0.7226 - val_loss: 0.9421 - val_accuracy: 0.6810
Epoch 10/20
1250/1250 [==============================] - 48s 38ms/step - loss: 0.7469 - accuracy: 0.7380 - val_loss: 0.9452 - val_accuracy: 0.6763
Epoch 11/20
1250/1250 [==============================] - 48s 39ms/step - loss: 0.7110 - accuracy: 0.7501 - val_loss: 0.9334 - val_accuracy: 0.6853
Epoch 12/20
1250/1250 [==============================] - 52s 42ms/step - loss: 0.6902 - accuracy: 0.7553 - val_loss: 0.9259 - val_accuracy: 0.6918
Epoch 13/20
1250/1250 [==============================] - 55s 44ms/step - loss: 0.6471 - accuracy: 0.7735 - val_loss: 0.9528 - val_accuracy: 0.6846
Epoch 14/20
1250/1250 [==============================] - 53s 42ms/step - loss: 0.6295 - accuracy: 0.7779 - val_loss: 0.9592 - val_accuracy: 0.6899
Epoch 15/20
1250/1250 [==============================] - 50s 40ms/step - loss: 0.6119 - accuracy: 0.7849 - val_loss: 0.9668 - val_accuracy: 0.6887
Epoch 16/20
1250/1250 [==============================] - 51s 40ms/step - loss: 0.5863 - accuracy: 0.7931 - val_loss: 0.9617 - val_accuracy: 0.6854
Epoch 17/20
1250/1250 [==============================] - 49s 39ms/step - loss: 0.5741 -

accuracy: 0.7974 - val_loss: 0.9806 - val_accuracy: 0.6887

Epoch 18/20

1250/1250 [==============================] - 47s 38ms/step - loss: 0.5480 - accuracy: 0.8059 - val_loss: 1.0022 - val_accuracy: 0.6895

Epoch 19/20

1250/1250 [==============================] - 47s 38ms/step - loss: 0.5381 - accuracy: 0.8079 - val_loss: 1.0685 - val_accuracy: 0.6786

Epoch 20/20

1250/1250 [==============================] - 53s 42ms/step - loss: 0.5233 - accuracy: 0.8153 - val_loss: 1.0112 - val_accuracy: 0.6932

Process finished with exit code 0