In [1]:
```
# Import our dependencies
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler,OneHotEncoder, MinMaxScaler
import pandas as pd
import tensorflow as tf
import numpy as np

# Import our input dataset
df = pd.read_csv('encoded_binned_df.csv')
df.head()
```

Out[1]:

	ERA	Hits	Earned Runs	Strike Outs	Home Runs	Wins	Losses	Outs Pitched	Batters Faced by Pitcher	Games Finished	Weight	Height	Games Started	salBin_low	salBin_
0	4.51	246	106	105	16	10	14	635	925	0	200	75	33	1	
1	5.97	37	23	25	0	0	5	104	162	0	185	75	7	1	
2	3.77	13	6	7	0	1	2	43	63	0	195	76	3	1	
3	4.53	214	95	82	20	7	18	566	797	0	178	71	31	1	
4	2.76	179	57	127	13	12	8	557	784	1	180	74	24	1	

In [2]:
```
### Drop unnecessary columns
df= df.filter(['Batters Faced by Pitcher','Outs Pitched','ERA','Strike Outs',"salBin_low","salBin_mid","s
df.head()
```

Out[2]:

	Batters Faced by Pitcher	Outs Pitched	ERA	Strike Outs	salBin_low	salBin_mid	salBin_high	salBin_top
0	925	635	4.51	105	1	0	0	0
1	162	104	5.97	25	1	0	0	0
2	63	43	3.77	7	1	0	0	0
3	797	566	4.53	82	1	0	0	0
4	784	557	2.76	127	1	0	0	0

Split Features/Target & Training/Testing Sets

Split into features and target

- **y variable**: Our target variables, `Salary-Bin_low` , `Salary-Bin_mid` , `Salary-Bin_high` , `Salary-Bin_top`
- **X variable**: Our features

In [3]:
```
# Split our preprocessed data into our features and target arrays
y = df[["salBin_low","salBin_mid","salBin_high","salBin_top"]].values
X = df.drop(["salBin_low","salBin_mid","salBin_high","salBin_top"],1).values

# Split the preprocessed data into a training and testing dataset
X_train, X_test, y_train, y_test = train_test_split(X, y, random_state=1)
```

```
C:\Users\alyss\anaconda3\envs\mlenv\lib\site-packages\ipykernel_launcher.py:3: FutureWarning: In a future
version of pandas all arguments of DataFrame.drop except for the argument 'labels' will be keyword-only
  This is separate from the ipykernel package so we can avoid doing imports until
```

Build and Instantiate `StandardScaler` object, then standardize numerical

features

In [4]:
```
# Create a StandardScaler instance
scaler = StandardScaler()

# Fit the StandardScaler
X_scaler = scaler.fit(X_train)

# Scale the data
X_train_scaled = X_scaler.transform(X_train)
X_test_scaled = X_scaler.transform(X_test)
```

Build Neural Net Framework

In [5]:
```
# Define the model - deep neural net
number_input_features = len(X_train[0])
hidden_nodes_layer1 = 144
hidden_nodes_layer2 = 144
hidden_nodes_layer3 = 32
hidden_nodes_layer4 = 32


nn = tf.keras.models.Sequential()

# First hidden layer
nn.add(
    tf.keras.layers.Dense(units=hidden_nodes_layer1, input_dim=number_input_features, activation="relu")
)

# Second hidden layer
nn.add(tf.keras.layers.Dense(units=hidden_nodes_layer2, activation="relu"))

# Third hidden layer
nn.add(tf.keras.layers.Dense(units=hidden_nodes_layer3, activation="relu"))

# Third hidden layer
nn.add(tf.keras.layers.Dense(units=hidden_nodes_layer4, activation="relu"))

# Output layer
nn.add(tf.keras.layers.Dense(units=4, activation="softmax"))

# Check the structure of the model
nn.summary()
```

```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 dense (Dense)               (None, 144)               720

 dense_1 (Dense)             (None, 144)               20880

 dense_2 (Dense)             (None, 32)                4640

 dense_3 (Dense)             (None, 32)                1056

 dense_4 (Dense)             (None, 4)                 132

=================================================================
Total params: 27,428
Trainable params: 27,428
Non-trainable params: 0
_________________________________________________________________
```

Compile the Model

In [6]:
```
# Compile the model
nn.compile(loss="CategoricalCrossentropy", optimizer="adam", metrics=["accuracy"])
```

Train the model

In [7]:
```
# Train the model
fit_model = nn.fit(X_train,y_train,epochs=1000)
```

```
Epoch 1/1000
116/116 [==============================] - 0s 734us/step - loss: 2.0676 - accuracy: 0.3825
Epoch 2/1000
116/116 [==============================] - 0s 722us/step - loss: 1.4235 - accuracy: 0.4173
Epoch 3/1000
116/116 [==============================] - 0s 739us/step - loss: 1.4041 - accuracy: 0.4230
Epoch 4/1000
116/116 [==============================] - 0s 722us/step - loss: 1.3521 - accuracy: 0.4155
Epoch 5/1000
116/116 [==============================] - 0s 713us/step - loss: 1.2614 - accuracy: 0.4381
Epoch 6/1000
116/116 [==============================] - 0s 722us/step - loss: 1.2508 - accuracy: 0.4376
Epoch 7/1000
116/116 [==============================] - 0s 713us/step - loss: 1.2214 - accuracy: 0.4395
Epoch 8/1000
116/116 [==============================] - 0s 722us/step - loss: 1.2418 - accuracy: 0.4254
Epoch 9/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1975 - accuracy: 0.4425
Epoch 10/1000
116/116 [==============================] - 0s 713us/step - loss: 1.2111 - accuracy: 0.4338
Epoch 11/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1990 - accuracy: 0.4460
Epoch 12/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1862 - accuracy: 0.4525
Epoch 13/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1706 - accuracy: 0.4616
Epoch 14/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1875 - accuracy: 0.4476
Epoch 15/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1808 - accuracy: 0.4519
Epoch 16/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1678 - accuracy: 0.4689
Epoch 17/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1723 - accuracy: 0.4679
Epoch 18/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1712 - accuracy: 0.4579
Epoch 19/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1671 - accuracy: 0.4670
Epoch 20/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1899 - accuracy: 0.4565
Epoch 21/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1743 - accuracy: 0.4614
Epoch 22/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1658 - accuracy: 0.4662
Epoch 23/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1606 - accuracy: 0.4665
Epoch 24/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1596 - accuracy: 0.4657
Epoch 25/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1517 - accuracy: 0.4660
Epoch 26/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1563 - accuracy: 0.4722
Epoch 27/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1566 - accuracy: 0.4684
Epoch 28/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1540 - accuracy: 0.4773
Epoch 29/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1530 - accuracy: 0.4711
Epoch 30/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1593 - accuracy: 0.4652
Epoch 31/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1471 - accuracy: 0.4751
Epoch 32/1000
```

```
116/116 [==============================] - 0s 704us/step - loss: 1.1507 - accuracy: 0.4757
Epoch 33/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1468 - accuracy: 0.4795
Epoch 34/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1502 - accuracy: 0.4746
Epoch 35/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1465 - accuracy: 0.4778
Epoch 36/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1473 - accuracy: 0.4792
Epoch 37/1000
116/116 [==============================] - 0s 731us/step - loss: 1.1479 - accuracy: 0.4706
Epoch 38/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1429 - accuracy: 0.4824
Epoch 39/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1502 - accuracy: 0.4762
Epoch 40/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1527 - accuracy: 0.4727
Epoch 41/1000
116/116 [==============================] - 0s 704us/step - loss: 1.1447 - accuracy: 0.4808
Epoch 42/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1467 - accuracy: 0.4719
Epoch 43/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1480 - accuracy: 0.4781
Epoch 44/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1502 - accuracy: 0.4708
Epoch 45/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1475 - accuracy: 0.4765
Epoch 46/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1445 - accuracy: 0.4814
Epoch 47/1000
116/116 [==============================] - 0s 704us/step - loss: 1.1458 - accuracy: 0.4757
Epoch 48/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1449 - accuracy: 0.4687
Epoch 49/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1462 - accuracy: 0.4706
Epoch 50/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1503 - accuracy: 0.4692
Epoch 51/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1582 - accuracy: 0.4741
Epoch 52/1000
116/116 [==============================] - 0s 704us/step - loss: 1.1650 - accuracy: 0.4660
Epoch 53/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1543 - accuracy: 0.4730
Epoch 54/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1423 - accuracy: 0.4770
Epoch 55/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1486 - accuracy: 0.4735
Epoch 56/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1510 - accuracy: 0.4716
Epoch 57/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1477 - accuracy: 0.4716
Epoch 58/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1411 - accuracy: 0.4811
Epoch 59/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1434 - accuracy: 0.4760
Epoch 60/1000
116/116 [==============================] - 0s 704us/step - loss: 1.1480 - accuracy: 0.4749
Epoch 61/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1455 - accuracy: 0.4778
Epoch 62/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1390 - accuracy: 0.4760
Epoch 63/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1462 - accuracy: 0.4727
Epoch 64/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1419 - accuracy: 0.4781
Epoch 65/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1430 - accuracy: 0.4751
Epoch 66/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1424 - accuracy: 0.4797
Epoch 67/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1383 - accuracy: 0.4754
Epoch 68/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1440 - accuracy: 0.4660
Epoch 69/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1396 - accuracy: 0.4784
Epoch 70/1000
```

```
116/116 [==============================] - 0s 730us/step - loss: 1.1395 - accuracy: 0.4751
Epoch 71/1000
116/116 [==============================] - 0s 861us/step - loss: 1.1373 - accuracy: 0.4789
Epoch 72/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1408 - accuracy: 0.4762
Epoch 73/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1423 - accuracy: 0.4754
Epoch 74/1000
116/116 [==============================] - 0s 731us/step - loss: 1.1450 - accuracy: 0.4746
Epoch 75/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1403 - accuracy: 0.4800
Epoch 76/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1363 - accuracy: 0.4797
Epoch 77/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1380 - accuracy: 0.4741
Epoch 78/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1397 - accuracy: 0.4781
Epoch 79/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1415 - accuracy: 0.4781
Epoch 80/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1378 - accuracy: 0.4868
Epoch 81/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1412 - accuracy: 0.4819
Epoch 82/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1400 - accuracy: 0.4781
Epoch 83/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1376 - accuracy: 0.4789
Epoch 84/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1365 - accuracy: 0.4833
Epoch 85/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1391 - accuracy: 0.4784
Epoch 86/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1384 - accuracy: 0.4814
Epoch 87/1000
116/116 [==============================] - 0s 704us/step - loss: 1.1367 - accuracy: 0.4819
Epoch 88/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1386 - accuracy: 0.4795
Epoch 89/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1409 - accuracy: 0.4773
Epoch 90/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1381 - accuracy: 0.4706
Epoch 91/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1396 - accuracy: 0.4816
Epoch 92/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1381 - accuracy: 0.4806
Epoch 93/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1370 - accuracy: 0.4778
Epoch 94/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1382 - accuracy: 0.4789
Epoch 95/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1376 - accuracy: 0.4776
Epoch 96/1000
116/116 [==============================] - 0s 731us/step - loss: 1.1375 - accuracy: 0.4884
Epoch 97/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1427 - accuracy: 0.4754
Epoch 98/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1372 - accuracy: 0.4816
Epoch 99/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1375 - accuracy: 0.4757
Epoch 100/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1377 - accuracy: 0.4768
Epoch 101/1000
116/116 [==============================] - 0s 704us/step - loss: 1.1367 - accuracy: 0.4797
Epoch 102/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1392 - accuracy: 0.4778
Epoch 103/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1366 - accuracy: 0.4733
Epoch 104/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1360 - accuracy: 0.4795
Epoch 105/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1379 - accuracy: 0.4841
Epoch 106/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1390 - accuracy: 0.4760
Epoch 107/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1385 - accuracy: 0.4760
Epoch 108/1000
```

```
116/116 [==============================] - 0s 713us/step - loss: 1.1367 - accuracy: 0.4741
Epoch 109/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1365 - accuracy: 0.4784
Epoch 110/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1375 - accuracy: 0.4757
Epoch 111/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1394 - accuracy: 0.4781
Epoch 112/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1373 - accuracy: 0.4784
Epoch 113/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1385 - accuracy: 0.4773
Epoch 114/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1346 - accuracy: 0.4787
Epoch 115/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1415 - accuracy: 0.4814
Epoch 116/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1394 - accuracy: 0.4806
Epoch 117/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1355 - accuracy: 0.4838
Epoch 118/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1348 - accuracy: 0.4822
Epoch 119/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1340 - accuracy: 0.4797
Epoch 120/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1390 - accuracy: 0.4789
Epoch 121/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1354 - accuracy: 0.4776
Epoch 122/1000
116/116 [==============================] - 0s 862us/step - loss: 1.1367 - accuracy: 0.4730
Epoch 123/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1365 - accuracy: 0.4743
Epoch 124/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1350 - accuracy: 0.4811
Epoch 125/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1352 - accuracy: 0.4795
Epoch 126/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1382 - accuracy: 0.4757
Epoch 127/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1348 - accuracy: 0.4797
Epoch 128/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1349 - accuracy: 0.4784
Epoch 129/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1336 - accuracy: 0.4749
Epoch 130/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1330 - accuracy: 0.4843
Epoch 131/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1333 - accuracy: 0.4816
Epoch 132/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1333 - accuracy: 0.4789
Epoch 133/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1337 - accuracy: 0.4735
Epoch 134/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1344 - accuracy: 0.4735
Epoch 135/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1383 - accuracy: 0.4784
Epoch 136/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1335 - accuracy: 0.4773
Epoch 137/1000
116/116 [==============================] - 0s 731us/step - loss: 1.1338 - accuracy: 0.4803
Epoch 138/1000
116/116 [==============================] - 0s 738us/step - loss: 1.1343 - accuracy: 0.4749
Epoch 139/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1330 - accuracy: 0.4824
Epoch 140/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1325 - accuracy: 0.4811
Epoch 141/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1307 - accuracy: 0.4762
Epoch 142/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1320 - accuracy: 0.4816
Epoch 143/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1363 - accuracy: 0.4770
Epoch 144/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1298 - accuracy: 0.4773
Epoch 145/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1318 - accuracy: 0.4822
Epoch 146/1000
```

```
116/116 [==============================] - 0s 757us/step - loss: 1.1313 - accuracy: 0.4806
Epoch 147/1000
116/116 [==============================] - 0s 835us/step - loss: 1.1328 - accuracy: 0.4778
Epoch 148/1000
116/116 [==============================] - 0s 800us/step - loss: 1.1327 - accuracy: 0.4768
Epoch 149/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1326 - accuracy: 0.4778
Epoch 150/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1300 - accuracy: 0.4816
Epoch 151/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1351 - accuracy: 0.4814
Epoch 152/1000
116/116 [==============================] - 0s 861us/step - loss: 1.1309 - accuracy: 0.4795
Epoch 153/1000
116/116 [==============================] - 0s 1000us/step - loss: 1.1326 - accuracy: 0.4865
Epoch 154/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1324 - accuracy: 0.4760
Epoch 155/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1309 - accuracy: 0.4765
Epoch 156/1000
116/116 [==============================] - 0s 843us/step - loss: 1.1307 - accuracy: 0.4776
Epoch 157/1000
116/116 [==============================] - 0s 791us/step - loss: 1.1289 - accuracy: 0.4797
Epoch 158/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1370 - accuracy: 0.4768
Epoch 159/1000
116/116 [==============================] - 0s 991us/step - loss: 1.1317 - accuracy: 0.4830
Epoch 160/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1310 - accuracy: 0.4819
Epoch 161/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1315 - accuracy: 0.4822
Epoch 162/1000
116/116 [==============================] - 0s 800us/step - loss: 1.1292 - accuracy: 0.4854
Epoch 163/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1319 - accuracy: 0.4838
Epoch 164/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1307 - accuracy: 0.4797
Epoch 165/1000
116/116 [==============================] - 0s 870us/step - loss: 1.1306 - accuracy: 0.4770
Epoch 166/1000
116/116 [==============================] - 0s 2ms/step - loss: 1.1324 - accuracy: 0.4781
Epoch 167/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1294 - accuracy: 0.4765
Epoch 168/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1298 - accuracy: 0.4811
Epoch 169/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1302 - accuracy: 0.4803
Epoch 170/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1306 - accuracy: 0.4838
Epoch 171/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1278 - accuracy: 0.4873
Epoch 172/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1344 - accuracy: 0.4751
Epoch 173/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1286 - accuracy: 0.4762
Epoch 174/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1295 - accuracy: 0.4757
Epoch 175/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1283 - accuracy: 0.4860
Epoch 176/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1293 - accuracy: 0.4849
Epoch 177/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1293 - accuracy: 0.4857
Epoch 178/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1338 - accuracy: 0.4806
Epoch 179/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1303 - accuracy: 0.4843
Epoch 180/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1294 - accuracy: 0.4773
Epoch 181/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1303 - accuracy: 0.4803
Epoch 182/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1294 - accuracy: 0.4822
Epoch 183/1000
116/116 [==============================] - 0s 744us/step - loss: 1.1279 - accuracy: 0.4789
Epoch 184/1000
```

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116/116 [==============================] - 0s 1ms/step - loss: 1.1279 - accuracy: 0.4822
Epoch 185/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1280 - accuracy: 0.4849
Epoch 186/1000
116/116 [==============================] - 0s 791us/step - loss: 1.1309 - accuracy: 0.4795
Epoch 187/1000
116/116 [==============================] - 0s 826us/step - loss: 1.1311 - accuracy: 0.4770
Epoch 188/1000
116/116 [==============================] - 0s 809us/step - loss: 1.1283 - accuracy: 0.4822
Epoch 189/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1267 - accuracy: 0.4806
Epoch 190/1000
116/116 [==============================] - 0s 835us/step - loss: 1.1273 - accuracy: 0.4800
Epoch 191/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1279 - accuracy: 0.4830
Epoch 192/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1281 - accuracy: 0.4781
Epoch 193/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1266 - accuracy: 0.4808
Epoch 194/1000
116/116 [==============================] - 0s 800us/step - loss: 1.1283 - accuracy: 0.4878
Epoch 195/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1255 - accuracy: 0.4876
Epoch 196/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1255 - accuracy: 0.4819
Epoch 197/1000
116/116 [==============================] - 0s 826us/step - loss: 1.1266 - accuracy: 0.4849
Epoch 198/1000
116/116 [==============================] - 0s 826us/step - loss: 1.1321 - accuracy: 0.4754
Epoch 199/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1269 - accuracy: 0.4808
Epoch 200/1000
116/116 [==============================] - 0s 852us/step - loss: 1.1248 - accuracy: 0.4838
Epoch 201/1000
116/116 [==============================] - 0s 843us/step - loss: 1.1287 - accuracy: 0.4778
Epoch 202/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1286 - accuracy: 0.4822
Epoch 203/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1262 - accuracy: 0.4841
Epoch 204/1000
116/116 [==============================] - 0s 791us/step - loss: 1.1254 - accuracy: 0.4784
Epoch 205/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1273 - accuracy: 0.4781
Epoch 206/1000
116/116 [==============================] - 0s 731us/step - loss: 1.1282 - accuracy: 0.4843
Epoch 207/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1278 - accuracy: 0.4816
Epoch 208/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1260 - accuracy: 0.4789
Epoch 209/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1236 - accuracy: 0.4833
Epoch 210/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1232 - accuracy: 0.4838
Epoch 211/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1243 - accuracy: 0.4827
Epoch 212/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1246 - accuracy: 0.4819
Epoch 213/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1278 - accuracy: 0.4811
Epoch 214/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1217 - accuracy: 0.4816
Epoch 215/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1227 - accuracy: 0.4835
Epoch 216/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1295 - accuracy: 0.4806
Epoch 217/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1256 - accuracy: 0.4792
Epoch 218/1000
116/116 [==============================] - 0s 791us/step - loss: 1.1230 - accuracy: 0.4827
Epoch 219/1000
116/116 [==============================] - 0s 809us/step - loss: 1.1235 - accuracy: 0.4838
Epoch 220/1000
116/116 [==============================] - 0s 809us/step - loss: 1.1238 - accuracy: 0.4792
Epoch 221/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1237 - accuracy: 0.4851
Epoch 222/1000
```

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116/116 [==============================] - 0s 765us/step - loss: 1.1234 - accuracy: 0.4808
Epoch 223/1000
116/116 [==============================] - 0s 731us/step - loss: 1.1234 - accuracy: 0.4835
Epoch 224/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1263 - accuracy: 0.4743
Epoch 225/1000
116/116 [==============================] - 0s 817us/step - loss: 1.1251 - accuracy: 0.4819
Epoch 226/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1237 - accuracy: 0.4765
Epoch 227/1000
116/116 [==============================] - 0s 904us/step - loss: 1.1222 - accuracy: 0.4816
Epoch 228/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1240 - accuracy: 0.4870
Epoch 229/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1257 - accuracy: 0.4819
Epoch 230/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1271 - accuracy: 0.4811
Epoch 231/1000
116/116 [==============================] - 0s 749us/step - loss: 1.1253 - accuracy: 0.4773
Epoch 232/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1209 - accuracy: 0.4822
Epoch 233/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1234 - accuracy: 0.4819
Epoch 234/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1236 - accuracy: 0.4862
Epoch 235/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1198 - accuracy: 0.4822
Epoch 236/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1230 - accuracy: 0.4846
Epoch 237/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1246 - accuracy: 0.4854
Epoch 238/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1231 - accuracy: 0.4878
Epoch 239/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1253 - accuracy: 0.4811
Epoch 240/1000
116/116 [==============================] - 0s 731us/step - loss: 1.1275 - accuracy: 0.4811
Epoch 241/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1232 - accuracy: 0.4870
Epoch 242/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1230 - accuracy: 0.4881
Epoch 243/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1200 - accuracy: 0.4870
Epoch 244/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1199 - accuracy: 0.4851
Epoch 245/1000
116/116 [==============================] - 0s 983us/step - loss: 1.1203 - accuracy: 0.4862
Epoch 246/1000
116/116 [==============================] - 0s 817us/step - loss: 1.1186 - accuracy: 0.4865
Epoch 247/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1203 - accuracy: 0.4870
Epoch 248/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1227 - accuracy: 0.4808
Epoch 249/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1220 - accuracy: 0.4860
Epoch 250/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1217 - accuracy: 0.4808
Epoch 251/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1218 - accuracy: 0.4889
Epoch 252/1000
116/116 [==============================] - 0s 896us/step - loss: 1.1196 - accuracy: 0.4884
Epoch 253/1000
116/116 [==============================] - 0s 843us/step - loss: 1.1202 - accuracy: 0.4887
Epoch 254/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1210 - accuracy: 0.4854
Epoch 255/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1212 - accuracy: 0.4914
Epoch 256/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1219 - accuracy: 0.4757
Epoch 257/1000
116/116 [==============================] - 0s 756us/step - loss: 1.1211 - accuracy: 0.4830
Epoch 258/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1190 - accuracy: 0.4878
Epoch 259/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1184 - accuracy: 0.4930
Epoch 260/1000
```

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116/116 [==============================] - 0s 739us/step - loss: 1.1185 - accuracy: 0.4816
Epoch 261/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1177 - accuracy: 0.4895
Epoch 262/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1213 - accuracy: 0.4806
Epoch 263/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1189 - accuracy: 0.4868
Epoch 264/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1191 - accuracy: 0.4870
Epoch 265/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1172 - accuracy: 0.4881
Epoch 266/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1189 - accuracy: 0.4830
Epoch 267/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1217 - accuracy: 0.4819
Epoch 268/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1189 - accuracy: 0.4833
Epoch 269/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1206 - accuracy: 0.4851
Epoch 270/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1186 - accuracy: 0.4849
Epoch 271/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1185 - accuracy: 0.4851
Epoch 272/1000
116/116 [==============================] - 0s 750us/step - loss: 1.1197 - accuracy: 0.4911
Epoch 273/1000
116/116 [==============================] - 0s 809us/step - loss: 1.1208 - accuracy: 0.4849
Epoch 274/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1177 - accuracy: 0.4854
Epoch 275/1000
116/116 [==============================] - 0s 861us/step - loss: 1.1190 - accuracy: 0.4889
Epoch 276/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1163 - accuracy: 0.4862
Epoch 277/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1161 - accuracy: 0.4905
Epoch 278/1000
116/116 [==============================] - 0s 887us/step - loss: 1.1188 - accuracy: 0.4846
Epoch 279/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1173 - accuracy: 0.4878
Epoch 280/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1283 - accuracy: 0.4851
Epoch 281/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1224 - accuracy: 0.4822
Epoch 282/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1195 - accuracy: 0.4851
Epoch 283/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1218 - accuracy: 0.4897
Epoch 284/1000
116/116 [==============================] - 0s 843us/step - loss: 1.1186 - accuracy: 0.4876
Epoch 285/1000
116/116 [==============================] - 0s 809us/step - loss: 1.1177 - accuracy: 0.4868
Epoch 286/1000
116/116 [==============================] - 0s 957us/step - loss: 1.1172 - accuracy: 0.4884
Epoch 287/1000
116/116 [==============================] - 0s 861us/step - loss: 1.1226 - accuracy: 0.4841
Epoch 288/1000
116/116 [==============================] - 0s 826us/step - loss: 1.1173 - accuracy: 0.4895
Epoch 289/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1194 - accuracy: 0.4876
Epoch 290/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1164 - accuracy: 0.4900
Epoch 291/1000
116/116 [==============================] - 0s 930us/step - loss: 1.1178 - accuracy: 0.4870
Epoch 292/1000
116/116 [==============================] - 0s 852us/step - loss: 1.1166 - accuracy: 0.4838
Epoch 293/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1173 - accuracy: 0.4811
Epoch 294/1000
116/116 [==============================] - 0s 861us/step - loss: 1.1197 - accuracy: 0.4830
Epoch 295/1000
116/116 [==============================] - 0s 991us/step - loss: 1.1167 - accuracy: 0.4868
Epoch 296/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1229 - accuracy: 0.4816
Epoch 297/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1182 - accuracy: 0.4862
Epoch 298/1000
```

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116/116 [==============================] - 0s 817us/step - loss: 1.1194 - accuracy: 0.4854
Epoch 299/1000
116/116 [==============================] - 0s 791us/step - loss: 1.1162 - accuracy: 0.4873
Epoch 300/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1183 - accuracy: 0.4865
Epoch 301/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1178 - accuracy: 0.4862
Epoch 302/1000
116/116 [==============================] - 0s 870us/step - loss: 1.1163 - accuracy: 0.4854
Epoch 303/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1179 - accuracy: 0.4841
Epoch 304/1000
116/116 [==============================] - 0s 904us/step - loss: 1.1136 - accuracy: 0.4860
Epoch 305/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1140 - accuracy: 0.4876
Epoch 306/1000
116/116 [==============================] - 0s 817us/step - loss: 1.1171 - accuracy: 0.4781
Epoch 307/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1192 - accuracy: 0.4870
Epoch 308/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1168 - accuracy: 0.4811
Epoch 309/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1166 - accuracy: 0.4878
Epoch 310/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1177 - accuracy: 0.4868
Epoch 311/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1165 - accuracy: 0.4911
Epoch 312/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1147 - accuracy: 0.4887
Epoch 313/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1189 - accuracy: 0.4870
Epoch 314/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1157 - accuracy: 0.4865
Epoch 315/1000
116/116 [==============================] - 0s 734us/step - loss: 1.1129 - accuracy: 0.4884
Epoch 316/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1144 - accuracy: 0.4860
Epoch 317/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1139 - accuracy: 0.4887
Epoch 318/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1138 - accuracy: 0.4892
Epoch 319/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1182 - accuracy: 0.4857
Epoch 320/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1179 - accuracy: 0.4835
Epoch 321/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1141 - accuracy: 0.4860
Epoch 322/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1202 - accuracy: 0.4865
Epoch 323/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1238 - accuracy: 0.4768
Epoch 324/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1187 - accuracy: 0.4905
Epoch 325/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1141 - accuracy: 0.4889
Epoch 326/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1177 - accuracy: 0.4857
Epoch 327/1000
116/116 [==============================] - 0s 948us/step - loss: 1.1156 - accuracy: 0.4835
Epoch 328/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1238 - accuracy: 0.4868
Epoch 329/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1163 - accuracy: 0.4884
Epoch 330/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1162 - accuracy: 0.4835
Epoch 331/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1144 - accuracy: 0.4865
Epoch 332/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1123 - accuracy: 0.4932
Epoch 333/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1154 - accuracy: 0.4878
Epoch 334/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1152 - accuracy: 0.4857
Epoch 335/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1127 - accuracy: 0.4919
Epoch 336/1000
```

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116/116 [==============================] - 0s 774us/step - loss: 1.1155 - accuracy: 0.4938
Epoch 337/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1147 - accuracy: 0.4897
Epoch 338/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1166 - accuracy: 0.4873
Epoch 339/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1119 - accuracy: 0.4868
Epoch 340/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1123 - accuracy: 0.4873
Epoch 341/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1167 - accuracy: 0.4876
Epoch 342/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1149 - accuracy: 0.4849
Epoch 343/1000
116/116 [==============================] - 0s 800us/step - loss: 1.1128 - accuracy: 0.4824
Epoch 344/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1148 - accuracy: 0.4868
Epoch 345/1000
116/116 [==============================] - 0s 761us/step - loss: 1.1224 - accuracy: 0.4811
Epoch 346/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1158 - accuracy: 0.4851
Epoch 347/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1150 - accuracy: 0.4827
Epoch 348/1000
116/116 [==============================] - 0s 957us/step - loss: 1.1137 - accuracy: 0.4900
Epoch 349/1000
116/116 [==============================] - 0s 835us/step - loss: 1.1136 - accuracy: 0.4833
Epoch 350/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1118 - accuracy: 0.4887
Epoch 351/1000
116/116 [==============================] - 0s 870us/step - loss: 1.1129 - accuracy: 0.4862
Epoch 352/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1111 - accuracy: 0.4884
Epoch 353/1000
116/116 [==============================] - 0s 835us/step - loss: 1.1147 - accuracy: 0.4873
Epoch 354/1000
116/116 [==============================] - 0s 861us/step - loss: 1.1112 - accuracy: 0.4878
Epoch 355/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1119 - accuracy: 0.4887
Epoch 356/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1139 - accuracy: 0.4876
Epoch 357/1000
116/116 [==============================] - 0s 983us/step - loss: 1.1211 - accuracy: 0.4860
Epoch 358/1000
116/116 [==============================] - 0s 930us/step - loss: 1.1264 - accuracy: 0.4884
Epoch 359/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1179 - accuracy: 0.4884
Epoch 360/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1099 - accuracy: 0.4911
Epoch 361/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1161 - accuracy: 0.4865
Epoch 362/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1148 - accuracy: 0.4897
Epoch 363/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1134 - accuracy: 0.4897
Epoch 364/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1134 - accuracy: 0.4841
Epoch 365/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1123 - accuracy: 0.4873
Epoch 366/1000
116/116 [==============================] - 0s 974us/step - loss: 1.1161 - accuracy: 0.4862
Epoch 367/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1136 - accuracy: 0.4851
Epoch 368/1000
116/116 [==============================] - 0s 800us/step - loss: 1.1080 - accuracy: 0.4887
Epoch 369/1000
116/116 [==============================] - 0s 896us/step - loss: 1.1100 - accuracy: 0.4876
Epoch 370/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1189 - accuracy: 0.4857
Epoch 371/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1128 - accuracy: 0.4887
Epoch 372/1000
116/116 [==============================] - 0s 800us/step - loss: 1.1142 - accuracy: 0.4857
Epoch 373/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1103 - accuracy: 0.4868
Epoch 374/1000
```

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116/116 [==============================] - 0s 774us/step - loss: 1.1121 - accuracy: 0.4887
Epoch 375/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1139 - accuracy: 0.4878
Epoch 376/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1081 - accuracy: 0.4941
Epoch 377/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1125 - accuracy: 0.4887
Epoch 378/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1174 - accuracy: 0.4814
Epoch 379/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1153 - accuracy: 0.4841
Epoch 380/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1138 - accuracy: 0.4889
Epoch 381/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1137 - accuracy: 0.4908
Epoch 382/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1144 - accuracy: 0.4887
Epoch 383/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1116 - accuracy: 0.4865
Epoch 384/1000
116/116 [==============================] - 0s 861us/step - loss: 1.1131 - accuracy: 0.4862
Epoch 385/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1112 - accuracy: 0.4846
Epoch 386/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1122 - accuracy: 0.4878
Epoch 387/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1126 - accuracy: 0.4868
Epoch 388/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1115 - accuracy: 0.4916
Epoch 389/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1164 - accuracy: 0.4822
Epoch 390/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1117 - accuracy: 0.4849
Epoch 391/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1160 - accuracy: 0.4884
Epoch 392/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1097 - accuracy: 0.4930
Epoch 393/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1099 - accuracy: 0.4932
Epoch 394/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1098 - accuracy: 0.4830
Epoch 395/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1095 - accuracy: 0.4865
Epoch 396/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1098 - accuracy: 0.4849
Epoch 397/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1128 - accuracy: 0.4941
Epoch 398/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1126 - accuracy: 0.4900
Epoch 399/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1110 - accuracy: 0.4870
Epoch 400/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1095 - accuracy: 0.4900
Epoch 401/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1108 - accuracy: 0.4851
Epoch 402/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1069 - accuracy: 0.4914
Epoch 403/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1110 - accuracy: 0.4860
Epoch 404/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1115 - accuracy: 0.4897
Epoch 405/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1136 - accuracy: 0.4914
Epoch 406/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1126 - accuracy: 0.4854
Epoch 407/1000
116/116 [==============================] - 0s 740us/step - loss: 1.1096 - accuracy: 0.4854
Epoch 408/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1077 - accuracy: 0.4916
Epoch 409/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1096 - accuracy: 0.4914
Epoch 410/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1076 - accuracy: 0.4932
Epoch 411/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1121 - accuracy: 0.4835
Epoch 412/1000
```

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116/116 [==============================] - 0s 722us/step - loss: 1.1143 - accuracy: 0.4843
Epoch 413/1000
116/116 [==============================] - 0s 852us/step - loss: 1.1118 - accuracy: 0.4884
Epoch 414/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1095 - accuracy: 0.4870
Epoch 415/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1072 - accuracy: 0.4908
Epoch 416/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1077 - accuracy: 0.4873
Epoch 417/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1141 - accuracy: 0.4900
Epoch 418/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1082 - accuracy: 0.4919
Epoch 419/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1196 - accuracy: 0.4849
Epoch 420/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1137 - accuracy: 0.4916
Epoch 421/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1066 - accuracy: 0.4900
Epoch 422/1000
116/116 [==============================] - 0s 731us/step - loss: 1.1108 - accuracy: 0.4892
Epoch 423/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1086 - accuracy: 0.4892
Epoch 424/1000
116/116 [==============================] - 0s 852us/step - loss: 1.1136 - accuracy: 0.4857
Epoch 425/1000
116/116 [==============================] - 0s 957us/step - loss: 1.1118 - accuracy: 0.4862
Epoch 426/1000
116/116 [==============================] - 0s 974us/step - loss: 1.1086 - accuracy: 0.4897
Epoch 427/1000
116/116 [==============================] - 0s 809us/step - loss: 1.1076 - accuracy: 0.4881
Epoch 428/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1087 - accuracy: 0.4851
Epoch 429/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1084 - accuracy: 0.4908
Epoch 430/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1064 - accuracy: 0.4924
Epoch 431/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1111 - accuracy: 0.4849
Epoch 432/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1101 - accuracy: 0.4916
Epoch 433/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1138 - accuracy: 0.4843
Epoch 434/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1097 - accuracy: 0.4892
Epoch 435/1000
116/116 [==============================] - 0s 713us/step - loss: 1.1159 - accuracy: 0.4905
Epoch 436/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1105 - accuracy: 0.4824
Epoch 437/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1067 - accuracy: 0.4911
Epoch 438/1000
116/116 [==============================] - 0s 861us/step - loss: 1.1141 - accuracy: 0.4892
Epoch 439/1000
116/116 [==============================] - 0s 809us/step - loss: 1.1120 - accuracy: 0.4843
Epoch 440/1000
116/116 [==============================] - 0s 852us/step - loss: 1.1073 - accuracy: 0.4878
Epoch 441/1000
116/116 [==============================] - 0s 800us/step - loss: 1.1097 - accuracy: 0.4892
Epoch 442/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1109 - accuracy: 0.4865
Epoch 443/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1091 - accuracy: 0.4897
Epoch 444/1000
116/116 [==============================] - 0s 870us/step - loss: 1.1063 - accuracy: 0.4938
Epoch 445/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1097 - accuracy: 0.4878
Epoch 446/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1051 - accuracy: 0.4873
Epoch 447/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1105 - accuracy: 0.4884
Epoch 448/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1110 - accuracy: 0.4857
Epoch 449/1000
116/116 [==============================] - 0s 957us/step - loss: 1.1104 - accuracy: 0.4897
Epoch 450/1000
```

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116/116 [==============================] - 0s 1ms/step - loss: 1.1105 - accuracy: 0.4892
Epoch 451/1000
116/116 [==============================] - 0s 965us/step - loss: 1.1097 - accuracy: 0.4900
Epoch 452/1000
116/116 [==============================] - 0s 870us/step - loss: 1.1079 - accuracy: 0.4905
Epoch 453/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1095 - accuracy: 0.4868
Epoch 454/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1059 - accuracy: 0.4897
Epoch 455/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1045 - accuracy: 0.4884
Epoch 456/1000
116/116 [==============================] - 0s 930us/step - loss: 1.1061 - accuracy: 0.4857
Epoch 457/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1117 - accuracy: 0.4916
Epoch 458/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1083 - accuracy: 0.4903
Epoch 459/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1070 - accuracy: 0.4851
Epoch 460/1000
116/116 [==============================] - 0s 957us/step - loss: 1.1097 - accuracy: 0.4878
Epoch 461/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1044 - accuracy: 0.4930
Epoch 462/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1111 - accuracy: 0.4932
Epoch 463/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1094 - accuracy: 0.4905
Epoch 464/1000
116/116 [==============================] - 0s 974us/step - loss: 1.1094 - accuracy: 0.4914
Epoch 465/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1084 - accuracy: 0.4857
Epoch 466/1000
116/116 [==============================] - 0s 788us/step - loss: 1.1063 - accuracy: 0.4905
Epoch 467/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1105 - accuracy: 0.4868
Epoch 468/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1029 - accuracy: 0.4895
Epoch 469/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1047 - accuracy: 0.4897
Epoch 470/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1100 - accuracy: 0.4851
Epoch 471/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1046 - accuracy: 0.4870
Epoch 472/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1089 - accuracy: 0.4943
Epoch 473/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1056 - accuracy: 0.4922
Epoch 474/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1051 - accuracy: 0.4884
Epoch 475/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1077 - accuracy: 0.4873
Epoch 476/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1057 - accuracy: 0.4851
Epoch 477/1000
116/116 [==============================] - 0s 870us/step - loss: 1.1065 - accuracy: 0.4919
Epoch 478/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1053 - accuracy: 0.4881
Epoch 479/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1020 - accuracy: 0.4916
Epoch 480/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1034 - accuracy: 0.4876
Epoch 481/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1070 - accuracy: 0.4868
Epoch 482/1000
116/116 [==============================] - 0s 939us/step - loss: 1.1106 - accuracy: 0.4857
Epoch 483/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1101 - accuracy: 0.4870
Epoch 484/1000
116/116 [==============================] - 0s 835us/step - loss: 1.1081 - accuracy: 0.4895
Epoch 485/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1042 - accuracy: 0.4897
Epoch 486/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1020 - accuracy: 0.4870
Epoch 487/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1022 - accuracy: 0.4889
Epoch 488/1000
```

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116/116 [==============================] - 0s 1ms/step - loss: 1.1065 - accuracy: 0.4900
Epoch 489/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1065 - accuracy: 0.4873
Epoch 490/1000
116/116 [==============================] - 0s 974us/step - loss: 1.1040 - accuracy: 0.4919
Epoch 491/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1201 - accuracy: 0.4814
Epoch 492/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1080 - accuracy: 0.4914
Epoch 493/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1076 - accuracy: 0.4849
Epoch 494/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1087 - accuracy: 0.4908
Epoch 495/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1060 - accuracy: 0.4908
Epoch 496/1000
116/116 [==============================] - 0s 826us/step - loss: 1.1092 - accuracy: 0.4843
Epoch 497/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1076 - accuracy: 0.4895
Epoch 498/1000
116/116 [==============================] - 0s 957us/step - loss: 1.1039 - accuracy: 0.4922
Epoch 499/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1070 - accuracy: 0.4878
Epoch 500/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1085 - accuracy: 0.4889
Epoch 501/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1054 - accuracy: 0.4884
Epoch 502/1000
116/116 [==============================] - 0s 735us/step - loss: 1.1061 - accuracy: 0.4916
Epoch 503/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1097 - accuracy: 0.4865
Epoch 504/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1077 - accuracy: 0.4895
Epoch 505/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1048 - accuracy: 0.4900
Epoch 506/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1038 - accuracy: 0.4862
Epoch 507/1000
116/116 [==============================] - 0s 809us/step - loss: 1.1111 - accuracy: 0.4846
Epoch 508/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1090 - accuracy: 0.4916
Epoch 509/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1066 - accuracy: 0.4919
Epoch 510/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1058 - accuracy: 0.4932
Epoch 511/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1054 - accuracy: 0.4838
Epoch 512/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1057 - accuracy: 0.4849
Epoch 513/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1081 - accuracy: 0.4889
Epoch 514/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1085 - accuracy: 0.4911
Epoch 515/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1061 - accuracy: 0.4884
Epoch 516/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1057 - accuracy: 0.4905
Epoch 517/1000
116/116 [==============================] - 0s 930us/step - loss: 1.1057 - accuracy: 0.4897
Epoch 518/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1085 - accuracy: 0.4908
Epoch 519/1000
116/116 [==============================] - 0s 974us/step - loss: 1.1123 - accuracy: 0.4924
Epoch 520/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1054 - accuracy: 0.4895
Epoch 521/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1047 - accuracy: 0.4895
Epoch 522/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1044 - accuracy: 0.4895
Epoch 523/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1157 - accuracy: 0.4865
Epoch 524/1000
116/116 [==============================] - 0s 809us/step - loss: 1.1067 - accuracy: 0.4822
Epoch 525/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1049 - accuracy: 0.4876
Epoch 526/1000
```

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116/116 [==============================] - 0s 739us/step - loss: 1.1080 - accuracy: 0.4868
Epoch 527/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1044 - accuracy: 0.4916
Epoch 528/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1004 - accuracy: 0.4922
Epoch 529/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1016 - accuracy: 0.4889
Epoch 530/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1011 - accuracy: 0.4927
Epoch 531/1000
116/116 [==============================] - 0s 800us/step - loss: 1.1102 - accuracy: 0.4862
Epoch 532/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1007 - accuracy: 0.4911
Epoch 533/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1051 - accuracy: 0.4903
Epoch 534/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1069 - accuracy: 0.4849
Epoch 535/1000
116/116 [==============================] - 0s 835us/step - loss: 1.1039 - accuracy: 0.4905
Epoch 536/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1068 - accuracy: 0.4911
Epoch 537/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1035 - accuracy: 0.4932
Epoch 538/1000
116/116 [==============================] - 0s 809us/step - loss: 1.1006 - accuracy: 0.4849
Epoch 539/1000
116/116 [==============================] - 0s 731us/step - loss: 1.1111 - accuracy: 0.4841
Epoch 540/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1026 - accuracy: 0.4884
Epoch 541/1000
116/116 [==============================] - 0s 835us/step - loss: 1.1050 - accuracy: 0.4887
Epoch 542/1000
116/116 [==============================] - 0s 731us/step - loss: 1.1024 - accuracy: 0.4927
Epoch 543/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1014 - accuracy: 0.4954
Epoch 544/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1098 - accuracy: 0.4876
Epoch 545/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1000 - accuracy: 0.4884
Epoch 546/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1009 - accuracy: 0.4903
Epoch 547/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1079 - accuracy: 0.4865
Epoch 548/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1046 - accuracy: 0.4895
Epoch 549/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1078 - accuracy: 0.4870
Epoch 550/1000
116/116 [==============================] - 0s 922us/step - loss: 1.1077 - accuracy: 0.4846
Epoch 551/1000
116/116 [==============================] - 0s 922us/step - loss: 1.1056 - accuracy: 0.4884
Epoch 552/1000
116/116 [==============================] - 0s 887us/step - loss: 1.0972 - accuracy: 0.4949
Epoch 553/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1073 - accuracy: 0.4914
Epoch 554/1000
116/116 [==============================] - 0s 843us/step - loss: 1.1041 - accuracy: 0.4911
Epoch 555/1000
116/116 [==============================] - 0s 957us/step - loss: 1.0999 - accuracy: 0.4900
Epoch 556/1000
116/116 [==============================] - 0s 913us/step - loss: 1.1004 - accuracy: 0.4914
Epoch 557/1000
116/116 [==============================] - 0s 896us/step - loss: 1.1066 - accuracy: 0.4900
Epoch 558/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1044 - accuracy: 0.4941
Epoch 559/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1085 - accuracy: 0.4927
Epoch 560/1000
116/116 [==============================] - 0s 731us/step - loss: 1.0986 - accuracy: 0.4914
Epoch 561/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1029 - accuracy: 0.4911
Epoch 562/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1108 - accuracy: 0.4868
Epoch 563/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1061 - accuracy: 0.4865
Epoch 564/1000
```

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116/116 [==============================] - 0s 809us/step - loss: 1.1071 - accuracy: 0.4857
Epoch 565/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0991 - accuracy: 0.4914
Epoch 566/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1112 - accuracy: 0.4854
Epoch 567/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1111 - accuracy: 0.4824
Epoch 568/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1069 - accuracy: 0.4903
Epoch 569/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1017 - accuracy: 0.4927
Epoch 570/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1033 - accuracy: 0.4919
Epoch 571/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1008 - accuracy: 0.4932
Epoch 572/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1036 - accuracy: 0.4881
Epoch 573/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1056 - accuracy: 0.4914
Epoch 574/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1038 - accuracy: 0.4857
Epoch 575/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1013 - accuracy: 0.4897
Epoch 576/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1143 - accuracy: 0.4927
Epoch 577/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1063 - accuracy: 0.4900
Epoch 578/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1071 - accuracy: 0.4905
Epoch 579/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1007 - accuracy: 0.4938
Epoch 580/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1017 - accuracy: 0.4876
Epoch 581/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1026 - accuracy: 0.4935
Epoch 582/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1005 - accuracy: 0.4922
Epoch 583/1000
116/116 [==============================] - 0s 896us/step - loss: 1.1007 - accuracy: 0.4946
Epoch 584/1000
116/116 [==============================] - 0s 991us/step - loss: 1.0997 - accuracy: 0.4919
Epoch 585/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1006 - accuracy: 0.4930
Epoch 586/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1002 - accuracy: 0.4968
Epoch 587/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1005 - accuracy: 0.4914
Epoch 588/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1079 - accuracy: 0.4911
Epoch 589/1000
116/116 [==============================] - 0s 861us/step - loss: 1.0991 - accuracy: 0.4922
Epoch 590/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0976 - accuracy: 0.4892
Epoch 591/1000
116/116 [==============================] - 0s 948us/step - loss: 1.1032 - accuracy: 0.4946
Epoch 592/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1039 - accuracy: 0.4892
Epoch 593/1000
116/116 [==============================] - 0s 983us/step - loss: 1.1025 - accuracy: 0.4892
Epoch 594/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1024 - accuracy: 0.4889
Epoch 595/1000
116/116 [==============================] - 0s 722us/step - loss: 1.0975 - accuracy: 0.4976
Epoch 596/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0967 - accuracy: 0.4908
Epoch 597/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1014 - accuracy: 0.4903
Epoch 598/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1010 - accuracy: 0.4887
Epoch 599/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0987 - accuracy: 0.4908
Epoch 600/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1000 - accuracy: 0.4962
Epoch 601/1000
116/116 [==============================] - 0s 791us/step - loss: 1.1084 - accuracy: 0.4927
Epoch 602/1000
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116/116 [==============================] - 0s 1ms/step - loss: 1.1016 - accuracy: 0.4919
Epoch 603/1000
116/116 [==============================] - 0s 974us/step - loss: 1.0998 - accuracy: 0.4932
Epoch 604/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1004 - accuracy: 0.4905
Epoch 605/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1035 - accuracy: 0.4897
Epoch 606/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1025 - accuracy: 0.4873
Epoch 607/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1053 - accuracy: 0.4908
Epoch 608/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1065 - accuracy: 0.4895
Epoch 609/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0979 - accuracy: 0.4932
Epoch 610/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.0978 - accuracy: 0.4922
Epoch 611/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.1025 - accuracy: 0.4884
Epoch 612/1000
116/116 [==============================] - 0s 843us/step - loss: 1.1083 - accuracy: 0.4881
Epoch 613/1000
116/116 [==============================] - 0s 835us/step - loss: 1.1014 - accuracy: 0.4911
Epoch 614/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.0971 - accuracy: 0.4919
Epoch 615/1000
116/116 [==============================] - 0s 887us/step - loss: 1.0982 - accuracy: 0.4941
Epoch 616/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0997 - accuracy: 0.4935
Epoch 617/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1243 - accuracy: 0.4860
Epoch 618/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1044 - accuracy: 0.4903
Epoch 619/1000
116/116 [==============================] - 0s 826us/step - loss: 1.0973 - accuracy: 0.4911
Epoch 620/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.0951 - accuracy: 0.4957
Epoch 621/1000
116/116 [==============================] - 0s 809us/step - loss: 1.0955 - accuracy: 0.4916
Epoch 622/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0955 - accuracy: 0.4922
Epoch 623/1000
116/116 [==============================] - 0s 870us/step - loss: 1.0977 - accuracy: 0.5014
Epoch 624/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.0973 - accuracy: 0.4954
Epoch 625/1000
116/116 [==============================] - 0s 870us/step - loss: 1.0958 - accuracy: 0.4962
Epoch 626/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0991 - accuracy: 0.4954
Epoch 627/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1084 - accuracy: 0.4865
Epoch 628/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0992 - accuracy: 0.4938
Epoch 629/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1050 - accuracy: 0.4927
Epoch 630/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0963 - accuracy: 0.4957
Epoch 631/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0971 - accuracy: 0.4976
Epoch 632/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0988 - accuracy: 0.4911
Epoch 633/1000
116/116 [==============================] - 0s 731us/step - loss: 1.1029 - accuracy: 0.4949
Epoch 634/1000
116/116 [==============================] - 0s 965us/step - loss: 1.0977 - accuracy: 0.4927
Epoch 635/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.0954 - accuracy: 0.4938
Epoch 636/1000
116/116 [==============================] - 0s 817us/step - loss: 1.1007 - accuracy: 0.4935
Epoch 637/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0974 - accuracy: 0.4919
Epoch 638/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0989 - accuracy: 0.4973
Epoch 639/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1008 - accuracy: 0.4946
Epoch 640/1000
```

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116/116 [==============================] - 0s 774us/step - loss: 1.1053 - accuracy: 0.4905
Epoch 641/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1067 - accuracy: 0.4903
Epoch 642/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1055 - accuracy: 0.4932
Epoch 643/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1183 - accuracy: 0.4838
Epoch 644/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1157 - accuracy: 0.4930
Epoch 645/1000
116/116 [==============================] - 0s 826us/step - loss: 1.0993 - accuracy: 0.4935
Epoch 646/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0981 - accuracy: 0.4941
Epoch 647/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1000 - accuracy: 0.4908
Epoch 648/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1008 - accuracy: 0.4941
Epoch 649/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1058 - accuracy: 0.4949
Epoch 650/1000
116/116 [==============================] - 0s 722us/step - loss: 1.0998 - accuracy: 0.4962
Epoch 651/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1068 - accuracy: 0.4908
Epoch 652/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0996 - accuracy: 0.4922
Epoch 653/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1072 - accuracy: 0.4897
Epoch 654/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1031 - accuracy: 0.4935
Epoch 655/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0964 - accuracy: 0.4973
Epoch 656/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0959 - accuracy: 0.4976
Epoch 657/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1015 - accuracy: 0.4951
Epoch 658/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0952 - accuracy: 0.4916
Epoch 659/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0983 - accuracy: 0.4997
Epoch 660/1000
116/116 [==============================] - 0s 783us/step - loss: 1.0940 - accuracy: 0.4949
Epoch 661/1000
116/116 [==============================] - 0s 904us/step - loss: 1.0940 - accuracy: 0.4989
Epoch 662/1000
116/116 [==============================] - 0s 722us/step - loss: 1.0946 - accuracy: 0.4959
Epoch 663/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0936 - accuracy: 0.4935
Epoch 664/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0986 - accuracy: 0.4911
Epoch 665/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1027 - accuracy: 0.4959
Epoch 666/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0999 - accuracy: 0.4930
Epoch 667/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0984 - accuracy: 0.4930
Epoch 668/1000
116/116 [==============================] - 0s 722us/step - loss: 1.0995 - accuracy: 0.4946
Epoch 669/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0965 - accuracy: 0.4862
Epoch 670/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1006 - accuracy: 0.4930
Epoch 671/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1058 - accuracy: 0.4932
Epoch 672/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1029 - accuracy: 0.4932
Epoch 673/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0946 - accuracy: 0.4932
Epoch 674/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0947 - accuracy: 0.4911
Epoch 675/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0963 - accuracy: 0.4976
Epoch 676/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1034 - accuracy: 0.4965
Epoch 677/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0982 - accuracy: 0.4976
Epoch 678/1000
```

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116/116 [==============================] - 0s 739us/step - loss: 1.0930 - accuracy: 0.4922
Epoch 679/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0921 - accuracy: 0.4916
Epoch 680/1000
116/116 [==============================] - 0s 791us/step - loss: 1.0978 - accuracy: 0.4911
Epoch 681/1000
116/116 [==============================] - 0s 843us/step - loss: 1.1031 - accuracy: 0.4943
Epoch 682/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0987 - accuracy: 0.4984
Epoch 683/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0952 - accuracy: 0.4978
Epoch 684/1000
116/116 [==============================] - 0s 809us/step - loss: 1.0938 - accuracy: 0.4905
Epoch 685/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0958 - accuracy: 0.4892
Epoch 686/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0957 - accuracy: 0.4914
Epoch 687/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0970 - accuracy: 0.4949
Epoch 688/1000
116/116 [==============================] - 0s 792us/step - loss: 1.0965 - accuracy: 0.4935
Epoch 689/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0946 - accuracy: 0.4922
Epoch 690/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0981 - accuracy: 0.4922
Epoch 691/1000
116/116 [==============================] - 0s 809us/step - loss: 1.0909 - accuracy: 0.4968
Epoch 692/1000
116/116 [==============================] - 0s 783us/step - loss: 1.0918 - accuracy: 0.4930
Epoch 693/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0939 - accuracy: 0.4965
Epoch 694/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0935 - accuracy: 0.4976
Epoch 695/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0982 - accuracy: 0.4941
Epoch 696/1000
116/116 [==============================] - 0s 774us/step - loss: 1.0923 - accuracy: 0.4970
Epoch 697/1000
116/116 [==============================] - 0s 774us/step - loss: 1.0984 - accuracy: 0.4895
Epoch 698/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0982 - accuracy: 0.4935
Epoch 699/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0939 - accuracy: 0.4973
Epoch 700/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1000 - accuracy: 0.4897
Epoch 701/1000
116/116 [==============================] - 0s 904us/step - loss: 1.0954 - accuracy: 0.4924
Epoch 702/1000
116/116 [==============================] - 0s 774us/step - loss: 1.0948 - accuracy: 0.4989
Epoch 703/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1020 - accuracy: 0.4927
Epoch 704/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1047 - accuracy: 0.4865
Epoch 705/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0939 - accuracy: 0.4930
Epoch 706/1000
116/116 [==============================] - 0s 722us/step - loss: 1.0937 - accuracy: 0.4932
Epoch 707/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1041 - accuracy: 0.4968
Epoch 708/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0946 - accuracy: 0.4943
Epoch 709/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0990 - accuracy: 0.4938
Epoch 710/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0955 - accuracy: 0.4968
Epoch 711/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0955 - accuracy: 0.4949
Epoch 712/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0943 - accuracy: 0.4924
Epoch 713/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0947 - accuracy: 0.4941
Epoch 714/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0940 - accuracy: 0.4935
Epoch 715/1000
116/116 [==============================] - 0s 783us/step - loss: 1.0952 - accuracy: 0.4935
Epoch 716/1000
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116/116 [==============================] - 0s 739us/step - loss: 1.0969 - accuracy: 0.4897
Epoch 717/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0955 - accuracy: 0.4968
Epoch 718/1000
116/116 [==============================] - 0s 722us/step - loss: 1.0929 - accuracy: 0.4970
Epoch 719/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0904 - accuracy: 0.4976
Epoch 720/1000
116/116 [==============================] - 0s 809us/step - loss: 1.0922 - accuracy: 0.4949
Epoch 721/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0940 - accuracy: 0.4949
Epoch 722/1000
116/116 [==============================] - 0s 774us/step - loss: 1.0909 - accuracy: 0.4943
Epoch 723/1000
116/116 [==============================] - 0s 722us/step - loss: 1.0904 - accuracy: 0.4965
Epoch 724/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0986 - accuracy: 0.4941
Epoch 725/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0967 - accuracy: 0.4976
Epoch 726/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0938 - accuracy: 0.4984
Epoch 727/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0988 - accuracy: 0.4968
Epoch 728/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0990 - accuracy: 0.4927
Epoch 729/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1066 - accuracy: 0.4897
Epoch 730/1000
116/116 [==============================] - 0s 957us/step - loss: 1.0953 - accuracy: 0.4911
Epoch 731/1000
116/116 [==============================] - 0s 930us/step - loss: 1.1050 - accuracy: 0.4951
Epoch 732/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1013 - accuracy: 0.4897
Epoch 733/1000
116/116 [==============================] - 0s 731us/step - loss: 1.0946 - accuracy: 0.4911
Epoch 734/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0912 - accuracy: 0.4954
Epoch 735/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0996 - accuracy: 0.4900
Epoch 736/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0921 - accuracy: 0.4954
Epoch 737/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0967 - accuracy: 0.4954
Epoch 738/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0974 - accuracy: 0.4973
Epoch 739/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1059 - accuracy: 0.4916
Epoch 740/1000
116/116 [==============================] - 0s 852us/step - loss: 1.0987 - accuracy: 0.4943
Epoch 741/1000
116/116 [==============================] - 0s 913us/step - loss: 1.0992 - accuracy: 0.4895
Epoch 742/1000
116/116 [==============================] - 0s 930us/step - loss: 1.0961 - accuracy: 0.4935
Epoch 743/1000
116/116 [==============================] - 0s 861us/step - loss: 1.0962 - accuracy: 0.4949
Epoch 744/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0932 - accuracy: 0.4924
Epoch 745/1000
116/116 [==============================] - 0s 791us/step - loss: 1.0975 - accuracy: 0.4922
Epoch 746/1000
116/116 [==============================] - 0s 957us/step - loss: 1.0967 - accuracy: 0.4908
Epoch 747/1000
116/116 [==============================] - 0s 809us/step - loss: 1.0950 - accuracy: 0.4989
Epoch 748/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0925 - accuracy: 0.4924
Epoch 749/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0934 - accuracy: 0.4962
Epoch 750/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1020 - accuracy: 0.4924
Epoch 751/1000
116/116 [==============================] - 0s 904us/step - loss: 1.0985 - accuracy: 0.4943
Epoch 752/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0988 - accuracy: 0.4932
Epoch 753/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0978 - accuracy: 0.4946
Epoch 754/1000
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116/116 [==============================] - 0s 748us/step - loss: 1.0968 - accuracy: 0.4924
Epoch 755/1000
116/116 [==============================] - 0s 809us/step - loss: 1.0987 - accuracy: 0.4935
Epoch 756/1000
116/116 [==============================] - 0s 774us/step - loss: 1.1149 - accuracy: 0.4881
Epoch 757/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0996 - accuracy: 0.4932
Epoch 758/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0924 - accuracy: 0.4957
Epoch 759/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0898 - accuracy: 0.4954
Epoch 760/1000
116/116 [==============================] - 0s 843us/step - loss: 1.0937 - accuracy: 0.4892
Epoch 761/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0930 - accuracy: 0.4997
Epoch 762/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1002 - accuracy: 0.4951
Epoch 763/1000
116/116 [==============================] - 0s 774us/step - loss: 1.0943 - accuracy: 0.4978
Epoch 764/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0926 - accuracy: 0.4957
Epoch 765/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0968 - accuracy: 0.4943
Epoch 766/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0965 - accuracy: 0.4938
Epoch 767/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0987 - accuracy: 0.4938
Epoch 768/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0965 - accuracy: 0.4932
Epoch 769/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0988 - accuracy: 0.4938
Epoch 770/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0923 - accuracy: 0.4935
Epoch 771/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0974 - accuracy: 0.4919
Epoch 772/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1101 - accuracy: 0.4889
Epoch 773/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0900 - accuracy: 0.4973
Epoch 774/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1035 - accuracy: 0.4881
Epoch 775/1000
116/116 [==============================] - 0s 783us/step - loss: 1.0959 - accuracy: 0.4927
Epoch 776/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0957 - accuracy: 0.4949
Epoch 777/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0983 - accuracy: 0.4878
Epoch 778/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0950 - accuracy: 0.4951
Epoch 779/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0968 - accuracy: 0.4927
Epoch 780/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0919 - accuracy: 0.4949
Epoch 781/1000
116/116 [==============================] - 0s 904us/step - loss: 1.0919 - accuracy: 0.4932
Epoch 782/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0941 - accuracy: 0.4989
Epoch 783/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0944 - accuracy: 0.4930
Epoch 784/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0940 - accuracy: 0.4951
Epoch 785/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0958 - accuracy: 0.4976
Epoch 786/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0897 - accuracy: 0.4949
Epoch 787/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0932 - accuracy: 0.4943
Epoch 788/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0982 - accuracy: 0.4897
Epoch 789/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0973 - accuracy: 0.4914
Epoch 790/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0953 - accuracy: 0.4927
Epoch 791/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0926 - accuracy: 0.4930
Epoch 792/1000
```

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116/116 [==============================] - 0s 739us/step - loss: 1.0952 - accuracy: 0.4970
Epoch 793/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0864 - accuracy: 0.4986
Epoch 794/1000
116/116 [==============================] - 0s 774us/step - loss: 1.0888 - accuracy: 0.4970
Epoch 795/1000
116/116 [==============================] - 0s 791us/step - loss: 1.1017 - accuracy: 0.4930
Epoch 796/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1028 - accuracy: 0.4908
Epoch 797/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0933 - accuracy: 0.4954
Epoch 798/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0872 - accuracy: 0.4989
Epoch 799/1000
116/116 [==============================] - 0s 731us/step - loss: 1.0991 - accuracy: 0.4951
Epoch 800/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0966 - accuracy: 0.4930
Epoch 801/1000
116/116 [==============================] - 0s 843us/step - loss: 1.0907 - accuracy: 0.4932
Epoch 802/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0914 - accuracy: 0.4946
Epoch 803/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0940 - accuracy: 0.4973
Epoch 804/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0900 - accuracy: 0.4949
Epoch 805/1000
116/116 [==============================] - 0s 747us/step - loss: 1.0900 - accuracy: 0.4957
Epoch 806/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0997 - accuracy: 0.4905
Epoch 807/1000
116/116 [==============================] - 0s 783us/step - loss: 1.1076 - accuracy: 0.4884
Epoch 808/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1012 - accuracy: 0.4930
Epoch 809/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0977 - accuracy: 0.4922
Epoch 810/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0906 - accuracy: 0.4962
Epoch 811/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0991 - accuracy: 0.4973
Epoch 812/1000
116/116 [==============================] - 0s 817us/step - loss: 1.0924 - accuracy: 0.4930
Epoch 813/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1055 - accuracy: 0.4946
Epoch 814/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0894 - accuracy: 0.4973
Epoch 815/1000
116/116 [==============================] - 0s 948us/step - loss: 1.0942 - accuracy: 0.4941
Epoch 816/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0914 - accuracy: 0.4930
Epoch 817/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0960 - accuracy: 0.4884
Epoch 818/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0908 - accuracy: 0.5008
Epoch 819/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1145 - accuracy: 0.4976
Epoch 820/1000
116/116 [==============================] - 0s 861us/step - loss: 1.0997 - accuracy: 0.4986
Epoch 821/1000
116/116 [==============================] - 0s 783us/step - loss: 1.0940 - accuracy: 0.4941
Epoch 822/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0877 - accuracy: 0.4981
Epoch 823/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0989 - accuracy: 0.4930
Epoch 824/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1104 - accuracy: 0.4930
Epoch 825/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1044 - accuracy: 0.4935
Epoch 826/1000
116/116 [==============================] - 0s 817us/step - loss: 1.0931 - accuracy: 0.4949
Epoch 827/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1036 - accuracy: 0.4905
Epoch 828/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0890 - accuracy: 0.5016
Epoch 829/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0847 - accuracy: 0.5024
Epoch 830/1000
```

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116/116 [==============================] - 0s 739us/step - loss: 1.0897 - accuracy: 0.5000
Epoch 831/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0954 - accuracy: 0.4927
Epoch 832/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1025 - accuracy: 0.4951
Epoch 833/1000
116/116 [==============================] - 0s 722us/step - loss: 1.0966 - accuracy: 0.4911
Epoch 834/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0976 - accuracy: 0.4951
Epoch 835/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1012 - accuracy: 0.4916
Epoch 836/1000
116/116 [==============================] - 0s 791us/step - loss: 1.0919 - accuracy: 0.4959
Epoch 837/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0898 - accuracy: 0.4997
Epoch 838/1000
116/116 [==============================] - 0s 843us/step - loss: 1.0978 - accuracy: 0.4935
Epoch 839/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0990 - accuracy: 0.4914
Epoch 840/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1033 - accuracy: 0.4911
Epoch 841/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0922 - accuracy: 0.4968
Epoch 842/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0944 - accuracy: 0.4951
Epoch 843/1000
116/116 [==============================] - 0s 722us/step - loss: 1.1026 - accuracy: 0.4946
Epoch 844/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1002 - accuracy: 0.4959
Epoch 845/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1061 - accuracy: 0.4881
Epoch 846/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1013 - accuracy: 0.4889
Epoch 847/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0989 - accuracy: 0.4914
Epoch 848/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0896 - accuracy: 0.4957
Epoch 849/1000
116/116 [==============================] - 0s 722us/step - loss: 1.0900 - accuracy: 0.4954
Epoch 850/1000
116/116 [==============================] - 0s 722us/step - loss: 1.0967 - accuracy: 0.4946
Epoch 851/1000
116/116 [==============================] - 0s 783us/step - loss: 1.0967 - accuracy: 0.5000
Epoch 852/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0942 - accuracy: 0.4924
Epoch 853/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0975 - accuracy: 0.4930
Epoch 854/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0904 - accuracy: 0.4941
Epoch 855/1000
116/116 [==============================] - 0s 843us/step - loss: 1.0944 - accuracy: 0.4914
Epoch 856/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0902 - accuracy: 0.5008
Epoch 857/1000
116/116 [==============================] - 0s 800us/step - loss: 1.0939 - accuracy: 0.4978
Epoch 858/1000
116/116 [==============================] - 0s 783us/step - loss: 1.0884 - accuracy: 0.4949
Epoch 859/1000
116/116 [==============================] - 0s 878us/step - loss: 1.0884 - accuracy: 0.4984
Epoch 860/1000
116/116 [==============================] - 0s 800us/step - loss: 1.0886 - accuracy: 0.4986
Epoch 861/1000
116/116 [==============================] - 0s 783us/step - loss: 1.0906 - accuracy: 0.4986
Epoch 862/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0880 - accuracy: 0.4973
Epoch 863/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0923 - accuracy: 0.4924
Epoch 864/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0911 - accuracy: 0.4965
Epoch 865/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0929 - accuracy: 0.4976
Epoch 866/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0890 - accuracy: 0.4959
Epoch 867/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0926 - accuracy: 0.4924
Epoch 868/1000
```

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116/116 [==============================] - 0s 739us/step - loss: 1.0963 - accuracy: 0.4924
Epoch 869/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0911 - accuracy: 0.4984
Epoch 870/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0872 - accuracy: 0.4981
Epoch 871/1000
116/116 [==============================] - 0s 826us/step - loss: 1.0919 - accuracy: 0.4943
Epoch 872/1000
116/116 [==============================] - 0s 774us/step - loss: 1.0911 - accuracy: 0.5000
Epoch 873/1000
116/116 [==============================] - 0s 800us/step - loss: 1.0888 - accuracy: 0.4981
Epoch 874/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0957 - accuracy: 0.4938
Epoch 875/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0919 - accuracy: 0.4965
Epoch 876/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0963 - accuracy: 0.4941
Epoch 877/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0925 - accuracy: 0.4935
Epoch 878/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0952 - accuracy: 0.4981
Epoch 879/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0902 - accuracy: 0.4922
Epoch 880/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0887 - accuracy: 0.4973
Epoch 881/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1000 - accuracy: 0.4922
Epoch 882/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0952 - accuracy: 0.5011
Epoch 883/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1129 - accuracy: 0.4897
Epoch 884/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0915 - accuracy: 0.4997
Epoch 885/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0900 - accuracy: 0.4973
Epoch 886/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0872 - accuracy: 0.5019
Epoch 887/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0956 - accuracy: 0.4957
Epoch 888/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0954 - accuracy: 0.4941
Epoch 889/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0872 - accuracy: 0.4970
Epoch 890/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1102 - accuracy: 0.4873
Epoch 891/1000
116/116 [==============================] - 0s 835us/step - loss: 1.0928 - accuracy: 0.4946
Epoch 892/1000
116/116 [==============================] - 0s 774us/step - loss: 1.0901 - accuracy: 0.4911
Epoch 893/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0889 - accuracy: 0.4965
Epoch 894/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0895 - accuracy: 0.4989
Epoch 895/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0913 - accuracy: 0.4946
Epoch 896/1000
116/116 [==============================] - 0s 748us/step - loss: 1.1113 - accuracy: 0.4932
Epoch 897/1000
116/116 [==============================] - 0s 783us/step - loss: 1.0920 - accuracy: 0.4946
Epoch 898/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0917 - accuracy: 0.4930
Epoch 899/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0965 - accuracy: 0.4965
Epoch 900/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0880 - accuracy: 0.4995
Epoch 901/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0918 - accuracy: 0.4970
Epoch 902/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0994 - accuracy: 0.4924
Epoch 903/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0873 - accuracy: 0.4949
Epoch 904/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0889 - accuracy: 0.5003
Epoch 905/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0872 - accuracy: 0.4908
Epoch 906/1000
```

```
116/116 [==============================] - 0s 739us/step - loss: 1.0876 - accuracy: 0.4992
Epoch 907/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0874 - accuracy: 0.4981
Epoch 908/1000
116/116 [==============================] - 0s 765us/step - loss: 1.1027 - accuracy: 0.4962
Epoch 909/1000
116/116 [==============================] - 0s 730us/step - loss: 1.1252 - accuracy: 0.4841
Epoch 910/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0987 - accuracy: 0.4943
Epoch 911/1000
116/116 [==============================] - 0s 843us/step - loss: 1.0978 - accuracy: 0.4938
Epoch 912/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0992 - accuracy: 0.4905
Epoch 913/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0887 - accuracy: 0.4995
Epoch 914/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0869 - accuracy: 0.4986
Epoch 915/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0969 - accuracy: 0.4938
Epoch 916/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0926 - accuracy: 0.4957
Epoch 917/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0878 - accuracy: 0.5003
Epoch 918/1000
116/116 [==============================] - 0s 774us/step - loss: 1.0873 - accuracy: 0.4986
Epoch 919/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0877 - accuracy: 0.5008
Epoch 920/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0859 - accuracy: 0.4951
Epoch 921/1000
116/116 [==============================] - 0s 861us/step - loss: 1.0882 - accuracy: 0.5000
Epoch 922/1000
116/116 [==============================] - 0s 861us/step - loss: 1.0884 - accuracy: 0.4941
Epoch 923/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0843 - accuracy: 0.4997
Epoch 924/1000
116/116 [==============================] - 0s 791us/step - loss: 1.1038 - accuracy: 0.4908
Epoch 925/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0970 - accuracy: 0.4932
Epoch 926/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0885 - accuracy: 0.4981
Epoch 927/1000
116/116 [==============================] - 0s 913us/step - loss: 1.0884 - accuracy: 0.4989
Epoch 928/1000
116/116 [==============================] - 0s 896us/step - loss: 1.1107 - accuracy: 0.4932
Epoch 929/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0939 - accuracy: 0.4957
Epoch 930/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0956 - accuracy: 0.4905
Epoch 931/1000
116/116 [==============================] - 0s 774us/step - loss: 1.0874 - accuracy: 0.4949
Epoch 932/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0861 - accuracy: 0.4973
Epoch 933/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0870 - accuracy: 0.4965
Epoch 934/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0857 - accuracy: 0.4946
Epoch 935/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0911 - accuracy: 0.5014
Epoch 936/1000
116/116 [==============================] - 0s 791us/step - loss: 1.0877 - accuracy: 0.4954
Epoch 937/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0921 - accuracy: 0.4946
Epoch 938/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0980 - accuracy: 0.4941
Epoch 939/1000
116/116 [==============================] - 0s 774us/step - loss: 1.0942 - accuracy: 0.4970
Epoch 940/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0916 - accuracy: 0.4992
Epoch 941/1000
116/116 [==============================] - 0s 783us/step - loss: 1.0869 - accuracy: 0.4995
Epoch 942/1000
116/116 [==============================] - 0s 783us/step - loss: 1.0901 - accuracy: 0.4984
Epoch 943/1000
116/116 [==============================] - 0s 843us/step - loss: 1.0874 - accuracy: 0.4978
Epoch 944/1000
```

```
116/116 [==============================] - 0s 739us/step - loss: 1.0924 - accuracy: 0.4930
Epoch 945/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0892 - accuracy: 0.4995
Epoch 946/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0938 - accuracy: 0.5043
Epoch 947/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0882 - accuracy: 0.5008
Epoch 948/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0872 - accuracy: 0.4938
Epoch 949/1000
116/116 [==============================] - 0s 722us/step - loss: 1.0890 - accuracy: 0.4935
Epoch 950/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1089 - accuracy: 0.4938
Epoch 951/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0884 - accuracy: 0.4957
Epoch 952/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0942 - accuracy: 0.4954
Epoch 953/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0894 - accuracy: 0.4986
Epoch 954/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0896 - accuracy: 0.4951
Epoch 955/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0873 - accuracy: 0.4957
Epoch 956/1000
116/116 [==============================] - 0s 852us/step - loss: 1.0861 - accuracy: 0.4970
Epoch 957/1000
116/116 [==============================] - 0s 783us/step - loss: 1.0915 - accuracy: 0.4941
Epoch 958/1000
116/116 [==============================] - 0s 791us/step - loss: 1.0887 - accuracy: 0.4962
Epoch 959/1000
116/116 [==============================] - 0s 774us/step - loss: 1.0891 - accuracy: 0.4938
Epoch 960/1000
116/116 [==============================] - 0s 774us/step - loss: 1.0890 - accuracy: 0.5003
Epoch 961/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0879 - accuracy: 0.4973
Epoch 962/1000
116/116 [==============================] - 0s 730us/step - loss: 1.0979 - accuracy: 0.4984
Epoch 963/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0976 - accuracy: 0.4959
Epoch 964/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0915 - accuracy: 0.4943
Epoch 965/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0960 - accuracy: 0.4914
Epoch 966/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0882 - accuracy: 0.4984
Epoch 967/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0904 - accuracy: 0.4965
Epoch 968/1000
116/116 [==============================] - 0s 948us/step - loss: 1.0909 - accuracy: 0.4930
Epoch 969/1000
116/116 [==============================] - 0s 991us/step - loss: 1.0957 - accuracy: 0.4957
Epoch 970/1000
116/116 [==============================] - 0s 1ms/step - loss: 1.0895 - accuracy: 0.4965
Epoch 971/1000
116/116 [==============================] - 0s 783us/step - loss: 1.0876 - accuracy: 0.4984
Epoch 972/1000
116/116 [==============================] - 0s 904us/step - loss: 1.0846 - accuracy: 0.5030
Epoch 973/1000
116/116 [==============================] - 0s 852us/step - loss: 1.0988 - accuracy: 0.4922
Epoch 974/1000
116/116 [==============================] - 0s 870us/step - loss: 1.1021 - accuracy: 0.4881
Epoch 975/1000
116/116 [==============================] - 0s 887us/step - loss: 1.0919 - accuracy: 0.4914
Epoch 976/1000
116/116 [==============================] - 0s 800us/step - loss: 1.0850 - accuracy: 0.5005
Epoch 977/1000
116/116 [==============================] - 0s 791us/step - loss: 1.1012 - accuracy: 0.4919
Epoch 978/1000
116/116 [==============================] - 0s 800us/step - loss: 1.0909 - accuracy: 0.4930
Epoch 979/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0982 - accuracy: 0.4957
Epoch 980/1000
116/116 [==============================] - 0s 791us/step - loss: 1.1399 - accuracy: 0.4833
Epoch 981/1000
116/116 [==============================] - 0s 739us/step - loss: 1.1104 - accuracy: 0.4919
Epoch 982/1000
```

```
116/116 [==============================] - 0s 809us/step - loss: 1.1006 - accuracy: 0.4892
Epoch 983/1000
116/116 [==============================] - 0s 800us/step - loss: 1.1083 - accuracy: 0.4870
Epoch 984/1000
116/116 [==============================] - 0s 757us/step - loss: 1.1061 - accuracy: 0.4954
Epoch 985/1000
116/116 [==============================] - 0s 783us/step - loss: 1.0968 - accuracy: 0.4968
Epoch 986/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0988 - accuracy: 0.4989
Epoch 987/1000
116/116 [==============================] - 0s 835us/step - loss: 1.0975 - accuracy: 0.4962
Epoch 988/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0968 - accuracy: 0.4919
Epoch 989/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0925 - accuracy: 0.4922
Epoch 990/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0900 - accuracy: 0.4949
Epoch 991/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0852 - accuracy: 0.4989
Epoch 992/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0911 - accuracy: 0.4922
Epoch 993/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0874 - accuracy: 0.4930
Epoch 994/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0969 - accuracy: 0.4887
Epoch 995/1000
116/116 [==============================] - 0s 757us/step - loss: 1.0914 - accuracy: 0.4962
Epoch 996/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0962 - accuracy: 0.4946
Epoch 997/1000
116/116 [==============================] - 0s 739us/step - loss: 1.0893 - accuracy: 0.4978
Epoch 998/1000
116/116 [==============================] - 0s 722us/step - loss: 1.0873 - accuracy: 0.4957
Epoch 999/1000
116/116 [==============================] - 0s 765us/step - loss: 1.0851 - accuracy: 0.5008
Epoch 1000/1000
116/116 [==============================] - 0s 748us/step - loss: 1.0895 - accuracy: 0.4951
```

In [11]:

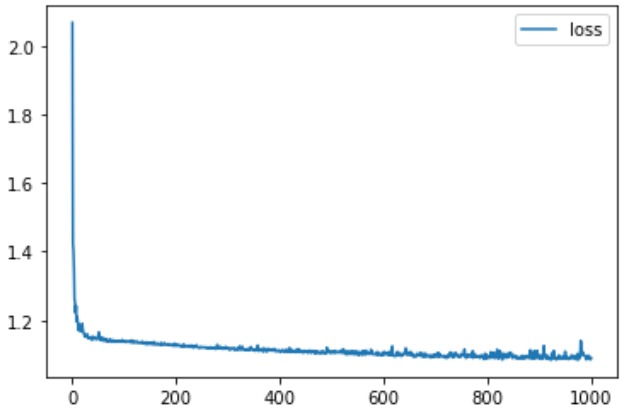
```
# Evaluate the model using the test data
model_loss, model_accuracy = nn.evaluate(X_test_scaled,y_test,verbose=2)
print(f"Loss: {model_loss*100:.2f}%, Accuracy: {model_accuracy*100:.2f}%")
```

```
39/39 - 0s - loss: 6.1429 - accuracy: 0.3563 - 32ms/epoch - 815us/step
Loss: 614.29%, Accuracy: 35.63%
```

In [12]:

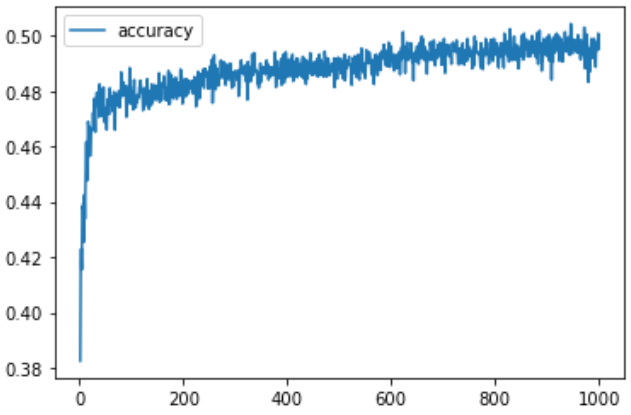
```
# Create a DataFrame containing training history
history_df = pd.DataFrame(fit_model.history, index=range(1,len(fit_model.history["loss"])+1))

# Plot the loss
history_df.plot(y="loss")
```

Out[12]: <AxesSubplot:>



In [13]:
```
# Plot the accuracy
history_df.plot(y="accuracy")
```

Out[13]: <AxesSubplot:>



In [ ]: