

DA_1

September 1, 2025

Name:	Tufan Kundu
Registration no:	24MDT0184
Course Name:	Deep Learning Lab
Course Code:	PMDS603P
Digital Assessment:	1

0.1 Q1. Using McCulloch Pitts model discussed in the class, write a Python code to implement the OR and AND Boolean functions. Also, plot the boundary input points and the linear classifier that we get in that case.

0.1.1 OR GATE

```
[2]: x1 = [0,0,1,1]
      x2 = [0,1,0,1]
      def or_func(x1,x2):
          x_or = []
          for i in range(len(x1)):
              if x1[i] == 0 and x2[i] == 0:
                  x_or.append(0)
              else:
                  x_or.append(1)
          return x_or
      x_or = or_func(x1,x2)
      g_or = [x1[i]+x2[i] for i in range(len(x1))]
```

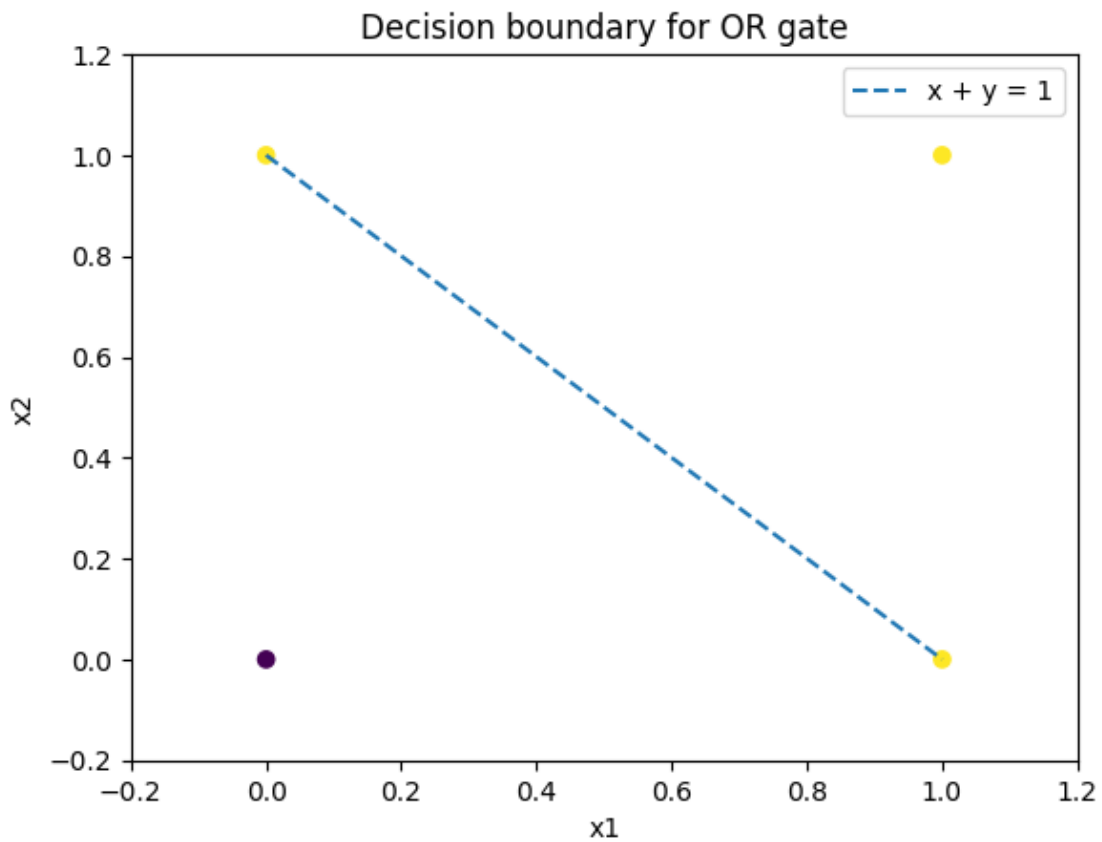
```
[3]: y_or = []
      for i in range(len(x1)):
          if g_or[i]>=1:
              y_or.append(1)
          else:
              y_or.append(0)
```

```
[4]: y_or
```

```
[4]: [0, 1, 1, 1]
```

0.1.2 Plotting the boundary points and the linear classifier for OR Gate

```
[6]: import matplotlib.pyplot as plt
import numpy as np
plt.scatter(x1,x2, c = y_or)
x = np.linspace(0, 1, 100)
y = 1 - x
plt.plot(x, y, label='x + y = 1', linestyle = '--')
plt.title("Decision boundary for OR gate")
plt.xlim(-0.2, 1.2)
plt.ylim(-0.2, 1.2)
plt.xlabel("x1")
plt.ylabel("x2")
plt.legend()
plt.show()
```



0.1.3 AND GATE

```
[8]: x1 = [0,0,1,1]
x2 = [0,1,0,1]
def and_func(x1,x2):
    x_and = []
    for i in range(len(x1)):
        if x1[i] == 1 and x2[i] == 1:
            x_and.append(1)
        else:
            x_and.append(0)
    return x_and
x_and = and_func(x1,x2)
g_and = [x1[i]+x2[i] for i in range(len(x1))]
```

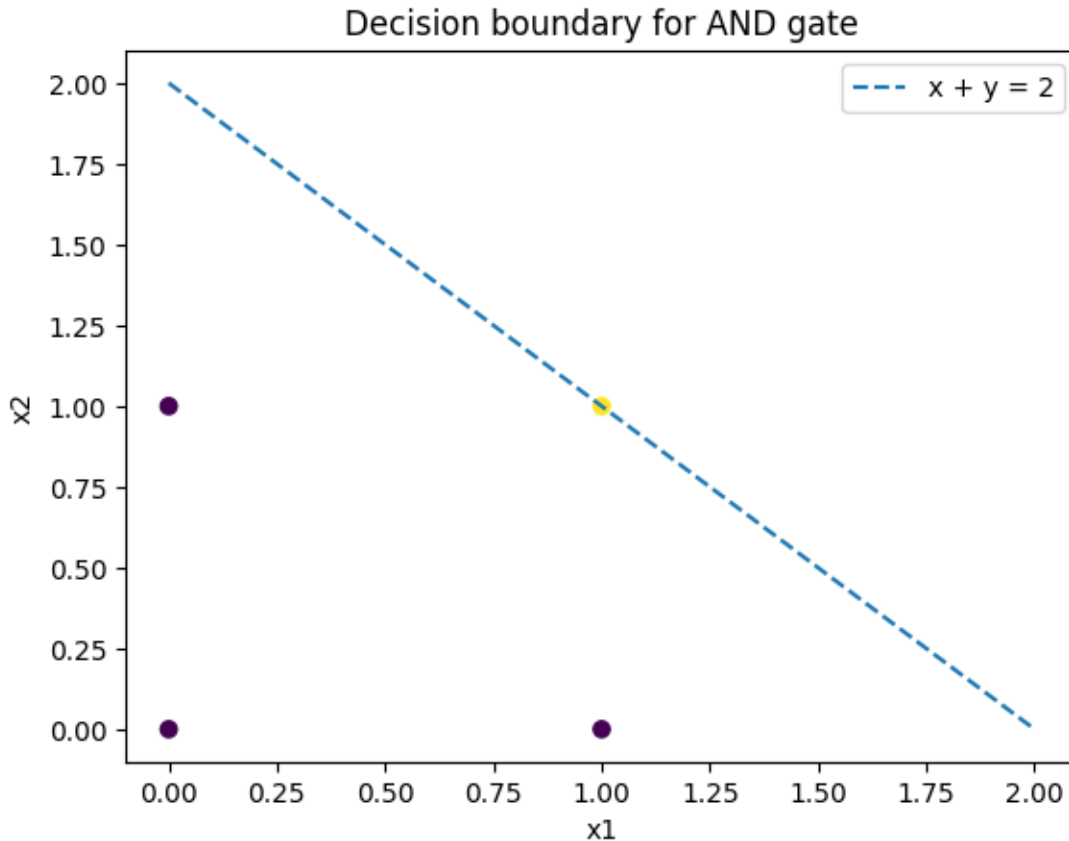
```
[9]: y_and = []
for i in range(len(x1)):
    if g_and[i]>=2:
        y_and.append(1)
    else:
        y_and.append(0)
```

```
[10]: y_and
```

```
[10]: [0, 0, 0, 1]
```

0.1.4 Plotting the boundary points and the linear classifier for AND Gate

```
[11]: plt.scatter(x1,x2, c = y_and)
x = np.linspace(0, 2, 100)
y = 2 - x
plt.plot(x, y, label='x + y = 2', linestyle = '--')
plt.title("Decision boundary for AND gate")
plt.legend()
plt.xlabel("x1")
plt.ylabel("x2")
plt.show()
```



- 0.2 Q2. Write a Python code to implement the Perceptron Learning Algorithm to implement OR, AND, NAND, NOR logic Gates and report the weights and bias. Also, print the inputs and outputs after training the weights properly. Further plot the linear classifier that you have obtained as well. Note that here the input vectors x should be extended with a x_0 term, which is taken as 1. Assume we have two inputs x_1 and x_2 so the x vector would be $[1, x_1, x_2]$

```
[13]: # Inputs
x1_input = np.array([0, 0, 1, 1])
x2_input = np.array([0, 1, 0, 1])
x_bias = np.ones_like(x1_input)
X = np.vstack([x_bias, x1_input, x2_input]).T

# Target
Y = {
    "AND": np.array([0, 0, 0, 1]),
    "OR": np.array([0, 1, 1, 1]),
    "NAND": np.array([1, 1, 1, 0]),
```

```

    "NOR": np.array([1, 0, 0, 0])
}

```

```

[14]: # Perceptron algorithm
def perceptron(X, y, lr=1, max_epochs=100):
    w = np.random.rand(X.shape[1]) - 0.5
    # Initializing weights in range [-0.5, 0.5) to allow both positive and
    ↪negative starting values for better learning dynamics
    for epoch in range(max_epochs):
        error = False
        for i in range(len(y)):
            y_pred = 1 if np.dot(w, X[i]) >= 0 else 0
            if y_pred != y[i]:
                w += lr * (y[i] - y_pred) * X[i]
                error = True
        if not error:
            break
    return w

```

```

[15]: # Plotting function
def plot_decision_boundary(w, X, y, title):
    plt.scatter(X[:, 1], X[:, 2], c=y, cmap='bwr', edgecolors='k', s=100)
    x1 = np.linspace(-0.2, 1.2, 100)
    x2 = (-w[0] - w[1] * x1) / w[2]
    plt.plot(x1, x2, '--k', label='Decision Boundary')
    plt.xlabel('x1')
    plt.ylabel('x2')
    plt.title(title)
    plt.legend()
    plt.xlim(-0.2, 1.2)
    plt.ylim(-0.2, 1.2)
    plt.show()

```

```

[16]: # Training and plot for each gate
for gate, y_true in Y.items():
    print(f"\nTraining for {gate} Gate")
    w_final = perceptron(X, y_true)
    print(f"Weights learned: {w_final}")
    outputs = []
    for i in range(len(X)):
        output = 1 if np.dot(w_final, X[i]) >= 0 else 0
        outputs.append(output)
        print(f"Input: {X[i][1:]}, Output: {output}")

    plot_decision_boundary(w_final, X, y_true, f"Decision Boundary for {gate} ↪
    ↪Gate")

```

Training for AND Gate

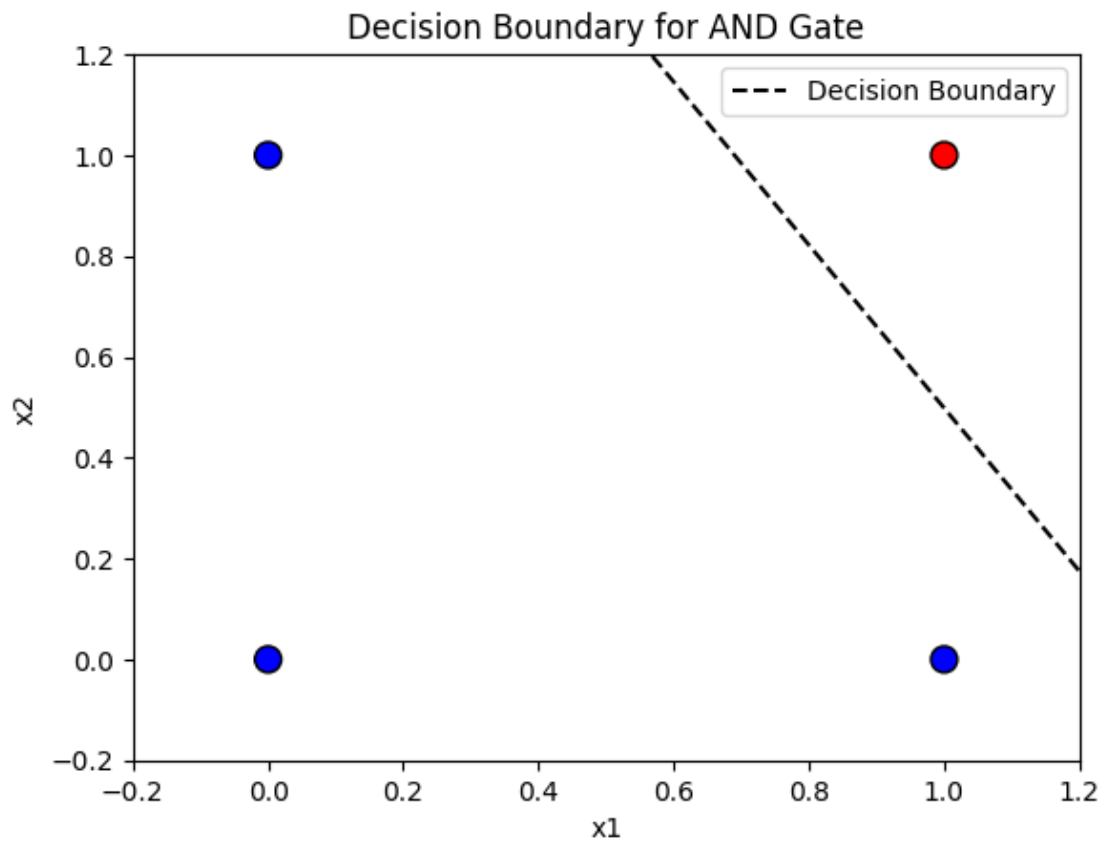
Weights learned: [-2.06831019 1.58109973 0.97767163]

Input: [0 0], Output: 0

Input: [0 1], Output: 0

Input: [1 0], Output: 0

Input: [1 1], Output: 1



Training for OR Gate

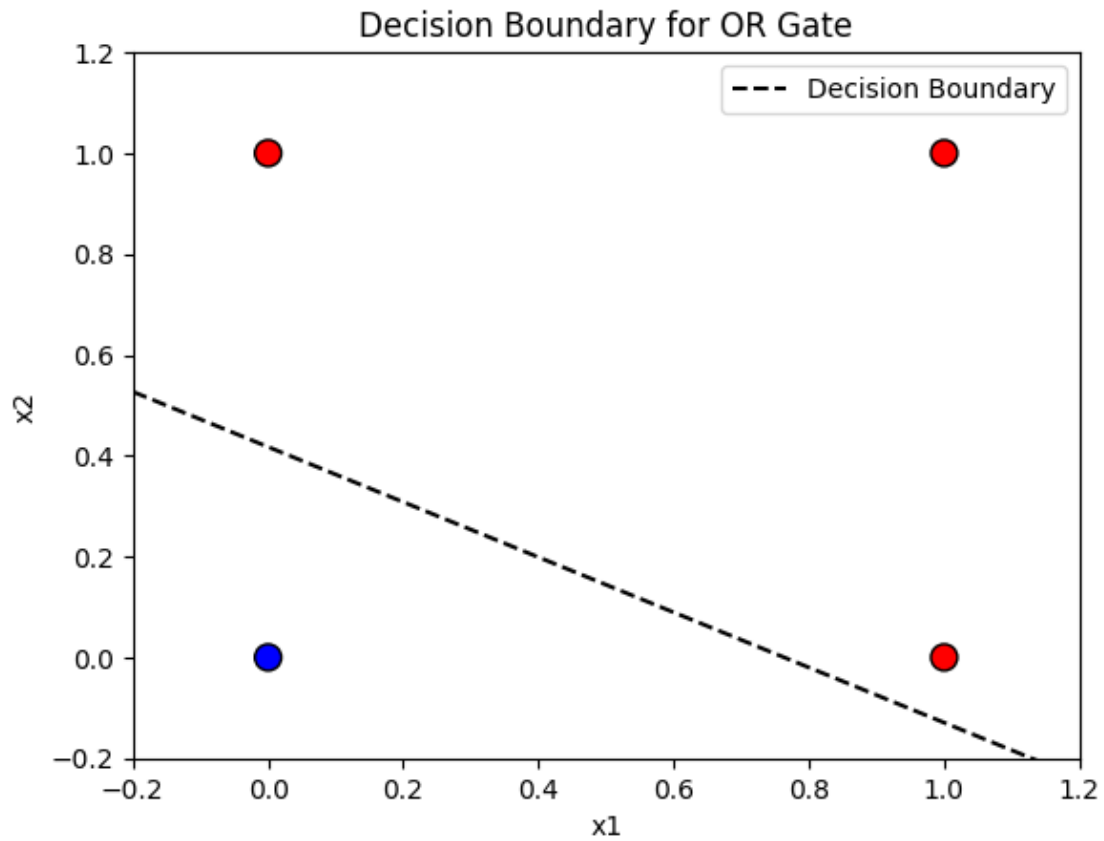
Weights learned: [-0.45461047 0.59556886 1.08896874]

Input: [0 0], Output: 0

Input: [0 1], Output: 1

Input: [1 0], Output: 1

Input: [1 1], Output: 1



Training for NAND Gate

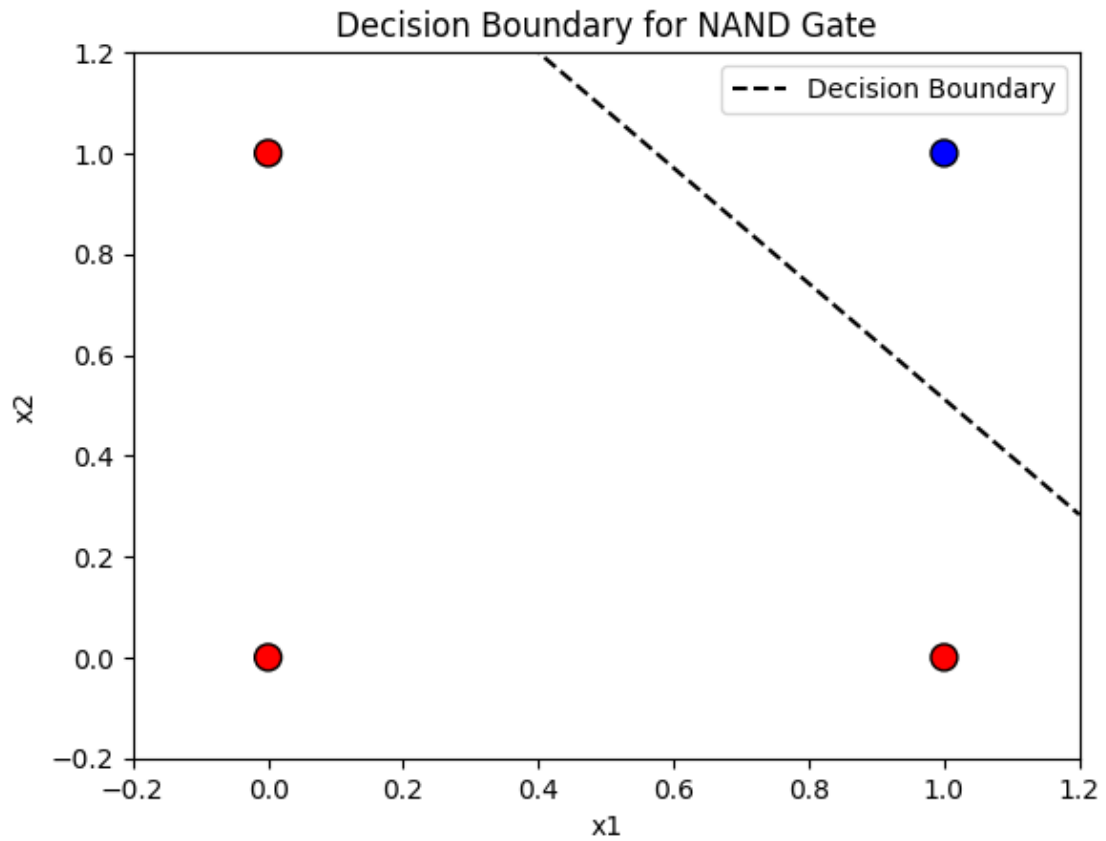
Weights learned: [2.52410536 -1.74422048 -1.52238958]

Input: [0 0], Output: 1

Input: [0 1], Output: 1

Input: [1 0], Output: 1

Input: [1 1], Output: 0



Training for NOR Gate

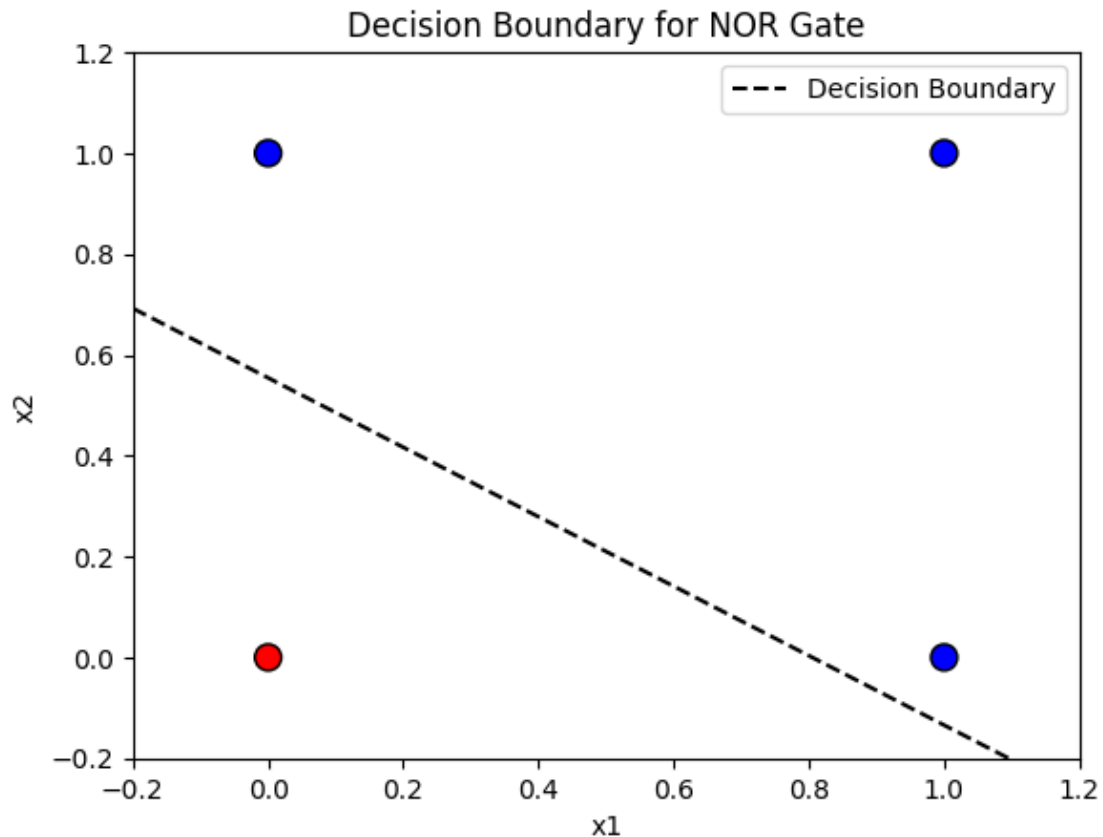
Weights learned: [0.75991229 -0.94416477 -1.37060917]

Input: [0 0], Output: 1

Input: [0 1], Output: 0

Input: [1 0], Output: 0

Input: [1 1], Output: 0



0.3 Q3. Next we will see how we can implement an XOR function using inbuilt tools.

```
[17]: import numpy as np
import matplotlib.pyplot as plt
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense

x = np.array([[0,0],[0,1],[1,0],[1,1]])
y = np.array([[0],[1],[1],[0]])

## Building MLP model
model = Sequential()
model.add(Dense(4,input_dim = 2, activation = 'sigmoid'))
model.add(Dense(1,activation = 'sigmoid'))

model.compile(loss = 'binary_crossentropy',optimizer = 'adam', metrics = ['accuracy'])

model.fit(x,y, epochs = 2000, verbose = 1)
```

```
print("XOR Function-- predictions:")
predictions = model.predict(x)
print(predictions)
```

```
c:\Users\TUFAN\.conda\envs\tf_env\lib\site-
packages\keras\src\layers\core\dense.py:93: UserWarning: Do not pass an
`input_shape`/`input_dim` argument to a layer. When using Sequential models,
prefer using an `Input(shape)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwargs)
```

Epoch 1/2000

1/1 1s 865ms/step -
accuracy: 0.5000 - loss: 0.7700

Epoch 2/2000

1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.7692

Epoch 3/2000

1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.7685

Epoch 4/2000

1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.7677

Epoch 5/2000

1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.7670

Epoch 6/2000

1/1 0s 65ms/step -
accuracy: 0.5000 - loss: 0.7663

Epoch 7/2000

1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.7655

Epoch 8/2000

1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.7648

Epoch 9/2000

1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.7641

Epoch 10/2000

1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.7634

Epoch 11/2000

1/1 0s 69ms/step -
accuracy: 0.5000 - loss: 0.7627

Epoch 12/2000

1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.7620

Epoch 13/2000

1/1 0s 41ms/step -

accuracy: 0.5000 - loss: 0.7613
Epoch 14/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.7606
Epoch 15/2000
1/1 0s 42ms/step -
accuracy: 0.5000 - loss: 0.7599
Epoch 16/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.7592
Epoch 17/2000
1/1 0s 42ms/step -
accuracy: 0.5000 - loss: 0.7585
Epoch 18/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.7578
Epoch 19/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.7572
Epoch 20/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.7565
Epoch 21/2000
1/1 0s 43ms/step -
accuracy: 0.5000 - loss: 0.7558
Epoch 22/2000
1/1 0s 43ms/step -
accuracy: 0.5000 - loss: 0.7552
Epoch 23/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.7545
Epoch 24/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.7539
Epoch 25/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.7532
Epoch 26/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.7526
Epoch 27/2000
1/1 0s 41ms/step -
accuracy: 0.5000 - loss: 0.7519
Epoch 28/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.7513
Epoch 29/2000
1/1 0s 45ms/step -

accuracy: 0.5000 - loss: 0.7507
Epoch 30/2000
1/1 0s 42ms/step -
accuracy: 0.5000 - loss: 0.7500
Epoch 31/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.7494
Epoch 32/2000
1/1 0s 42ms/step -
accuracy: 0.5000 - loss: 0.7488
Epoch 33/2000
1/1 0s 81ms/step -
accuracy: 0.5000 - loss: 0.7482
Epoch 34/2000
1/1 0s 64ms/step -
accuracy: 0.5000 - loss: 0.7476
Epoch 35/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.7470
Epoch 36/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.7464
Epoch 37/2000
1/1 0s 57ms/step -
accuracy: 0.5000 - loss: 0.7458
Epoch 38/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.7452
Epoch 39/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.7447
Epoch 40/2000
1/1 0s 43ms/step -
accuracy: 0.5000 - loss: 0.7441
Epoch 41/2000
1/1 0s 41ms/step -
accuracy: 0.5000 - loss: 0.7435
Epoch 42/2000
1/1 0s 43ms/step -
accuracy: 0.5000 - loss: 0.7430
Epoch 43/2000
1/1 0s 42ms/step -
accuracy: 0.5000 - loss: 0.7424
Epoch 44/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.7418
Epoch 45/2000
1/1 0s 42ms/step -

accuracy: 0.5000 - loss: 0.7413
Epoch 46/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.7407
Epoch 47/2000
1/1 0s 43ms/step -
accuracy: 0.5000 - loss: 0.7402
Epoch 48/2000
1/1 0s 43ms/step -
accuracy: 0.5000 - loss: 0.7397
Epoch 49/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.7391
Epoch 50/2000
1/1 0s 42ms/step -
accuracy: 0.5000 - loss: 0.7386
Epoch 51/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.7381
Epoch 52/2000
1/1 0s 42ms/step -
accuracy: 0.5000 - loss: 0.7376
Epoch 53/2000
1/1 0s 43ms/step -
accuracy: 0.5000 - loss: 0.7370
Epoch 54/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.7365
Epoch 55/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.7360
Epoch 56/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.7355
Epoch 57/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.7350
Epoch 58/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.7345
Epoch 59/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.7341
Epoch 60/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.7336
Epoch 61/2000
1/1 0s 51ms/step -

accuracy: 0.5000 - loss: 0.7331
Epoch 62/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.7326
Epoch 63/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.7322
Epoch 64/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.7317
Epoch 65/2000
1/1 0s 145ms/step -
accuracy: 0.5000 - loss: 0.7312
Epoch 66/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.7308
Epoch 67/2000
1/1 0s 61ms/step -
accuracy: 0.5000 - loss: 0.7303
Epoch 68/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.7299
Epoch 69/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.7294
Epoch 70/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.7290
Epoch 71/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.7286
Epoch 72/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.7281
Epoch 73/2000
1/1 0s 41ms/step -
accuracy: 0.5000 - loss: 0.7277
Epoch 74/2000
1/1 0s 43ms/step -
accuracy: 0.5000 - loss: 0.7273
Epoch 75/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.7269
Epoch 76/2000
1/1 0s 42ms/step -
accuracy: 0.5000 - loss: 0.7264
Epoch 77/2000
1/1 0s 43ms/step -

accuracy: 0.5000 - loss: 0.7260
Epoch 78/2000
1/1 0s 41ms/step -
accuracy: 0.5000 - loss: 0.7256
Epoch 79/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.7252
Epoch 80/2000
1/1 0s 42ms/step -
accuracy: 0.5000 - loss: 0.7248
Epoch 81/2000
1/1 0s 42ms/step -
accuracy: 0.5000 - loss: 0.7244
Epoch 82/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.7240
Epoch 83/2000
1/1 0s 41ms/step -
accuracy: 0.5000 - loss: 0.7236
Epoch 84/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.7233
Epoch 85/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.7229
Epoch 86/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.7225
Epoch 87/2000
1/1 0s 42ms/step -
accuracy: 0.5000 - loss: 0.7221
Epoch 88/2000
1/1 0s 43ms/step -
accuracy: 0.5000 - loss: 0.7218
Epoch 89/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.7214
Epoch 90/2000
1/1 0s 64ms/step -
accuracy: 0.5000 - loss: 0.7210
Epoch 91/2000
1/1 0s 61ms/step -
accuracy: 0.5000 - loss: 0.7207
Epoch 92/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.7203
Epoch 93/2000
1/1 0s 58ms/step -

accuracy: 0.5000 - loss: 0.7200
Epoch 94/2000
1/1 0s 66ms/step -
accuracy: 0.5000 - loss: 0.7196
Epoch 95/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.7193
Epoch 96/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.7189
Epoch 97/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.7186
Epoch 98/2000
1/1 0s 42ms/step -
accuracy: 0.5000 - loss: 0.7183
Epoch 99/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.7179
Epoch 100/2000
1/1 0s 43ms/step -
accuracy: 0.5000 - loss: 0.7176
Epoch 101/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.7173
Epoch 102/2000
1/1 0s 43ms/step -
accuracy: 0.5000 - loss: 0.7170
Epoch 103/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.7167
Epoch 104/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.7163
Epoch 105/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.7160
Epoch 106/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.7157
Epoch 107/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.7154
Epoch 108/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.7151
Epoch 109/2000
1/1 0s 43ms/step -

accuracy: 0.5000 - loss: 0.7148
Epoch 110/2000
1/1 0s 41ms/step -
accuracy: 0.5000 - loss: 0.7145
Epoch 111/2000
1/1 0s 42ms/step -
accuracy: 0.5000 - loss: 0.7142
Epoch 112/2000
1/1 0s 84ms/step -
accuracy: 0.5000 - loss: 0.7139
Epoch 113/2000
1/1 0s 42ms/step -
accuracy: 0.5000 - loss: 0.7137
Epoch 114/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.7134
Epoch 115/2000
1/1 0s 60ms/step -
accuracy: 0.5000 - loss: 0.7131
Epoch 116/2000
1/1 0s 41ms/step -
accuracy: 0.5000 - loss: 0.7128
Epoch 117/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.7126
Epoch 118/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.7123
Epoch 119/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.7120
Epoch 120/2000
1/1 0s 60ms/step -
accuracy: 0.5000 - loss: 0.7118
Epoch 121/2000
1/1 0s 72ms/step -
accuracy: 0.5000 - loss: 0.7115
Epoch 122/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.7112
Epoch 123/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.7110
Epoch 124/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.7107
Epoch 125/2000
1/1 0s 61ms/step -

accuracy: 0.5000 - loss: 0.7105
Epoch 126/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.7102
Epoch 127/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.7100
Epoch 128/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.7097
Epoch 129/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.7095
Epoch 130/2000
1/1 0s 183ms/step -
accuracy: 0.5000 - loss: 0.7093
Epoch 131/2000
1/1 0s 95ms/step -
accuracy: 0.5000 - loss: 0.7090
Epoch 132/2000
1/1 0s 74ms/step -
accuracy: 0.5000 - loss: 0.7088
Epoch 133/2000
1/1 0s 83ms/step -
accuracy: 0.5000 - loss: 0.7086
Epoch 134/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.7083
Epoch 135/2000
1/1 0s 84ms/step -
accuracy: 0.5000 - loss: 0.7081
Epoch 136/2000
1/1 0s 140ms/step -
accuracy: 0.5000 - loss: 0.7079
Epoch 137/2000
1/1 0s 83ms/step -
accuracy: 0.5000 - loss: 0.7077
Epoch 138/2000
1/1 0s 148ms/step -
accuracy: 0.5000 - loss: 0.7075
Epoch 139/2000
1/1 0s 135ms/step -
accuracy: 0.5000 - loss: 0.7073
Epoch 140/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.7070
Epoch 141/2000
1/1 0s 63ms/step -

accuracy: 0.5000 - loss: 0.7068
Epoch 142/2000
1/1 0s 59ms/step -
accuracy: 0.5000 - loss: 0.7066
Epoch 143/2000
1/1 0s 78ms/step -
accuracy: 0.5000 - loss: 0.7064
Epoch 144/2000
1/1 0s 73ms/step -
accuracy: 0.5000 - loss: 0.7062
Epoch 145/2000
1/1 0s 62ms/step -
accuracy: 0.5000 - loss: 0.7060
Epoch 146/2000
1/1 0s 72ms/step -
accuracy: 0.5000 - loss: 0.7058
Epoch 147/2000
1/1 0s 163ms/step -
accuracy: 0.5000 - loss: 0.7056
Epoch 148/2000
1/1 0s 91ms/step -
accuracy: 0.5000 - loss: 0.7054
Epoch 149/2000
1/1 0s 64ms/step -
accuracy: 0.5000 - loss: 0.7052
Epoch 150/2000
1/1 0s 83ms/step -
accuracy: 0.5000 - loss: 0.7051
Epoch 151/2000
1/1 0s 70ms/step -
accuracy: 0.5000 - loss: 0.7049
Epoch 152/2000
1/1 0s 133ms/step -
accuracy: 0.5000 - loss: 0.7047
Epoch 153/2000
1/1 0s 60ms/step -
accuracy: 0.5000 - loss: 0.7045
Epoch 154/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.7043
Epoch 155/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.7042
Epoch 156/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.7040
Epoch 157/2000
1/1 0s 51ms/step -

accuracy: 0.5000 - loss: 0.7038
Epoch 158/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.7036
Epoch 159/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.7035
Epoch 160/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.7033
Epoch 161/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.7031
Epoch 162/2000
1/1 0s 75ms/step -
accuracy: 0.5000 - loss: 0.7030
Epoch 163/2000
1/1 0s 115ms/step -
accuracy: 0.5000 - loss: 0.7028
Epoch 164/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.7027
Epoch 165/2000
1/1 0s 72ms/step -
accuracy: 0.5000 - loss: 0.7025
Epoch 166/2000
1/1 0s 57ms/step -
accuracy: 0.5000 - loss: 0.7023
Epoch 167/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.7022
Epoch 168/2000
1/1 0s 67ms/step -
accuracy: 0.5000 - loss: 0.7020
Epoch 169/2000
1/1 0s 79ms/step -
accuracy: 0.5000 - loss: 0.7019
Epoch 170/2000
1/1 0s 79ms/step -
accuracy: 0.5000 - loss: 0.7017
Epoch 171/2000
1/1 0s 79ms/step -
accuracy: 0.5000 - loss: 0.7016
Epoch 172/2000
1/1 0s 83ms/step -
accuracy: 0.5000 - loss: 0.7015
Epoch 173/2000
1/1 0s 163ms/step -

accuracy: 0.5000 - loss: 0.7013
Epoch 174/2000
1/1 0s 72ms/step -
accuracy: 0.5000 - loss: 0.7012
Epoch 175/2000
1/1 0s 61ms/step -
accuracy: 0.5000 - loss: 0.7010
Epoch 176/2000
1/1 0s 57ms/step -
accuracy: 0.5000 - loss: 0.7009
Epoch 177/2000
1/1 0s 63ms/step -
accuracy: 0.5000 - loss: 0.7008
Epoch 178/2000
1/1 0s 80ms/step -
accuracy: 0.5000 - loss: 0.7006
Epoch 179/2000
1/1 0s 83ms/step -
accuracy: 0.5000 - loss: 0.7005
Epoch 180/2000
1/1 0s 64ms/step -
accuracy: 0.5000 - loss: 0.7004
Epoch 181/2000
1/1 0s 64ms/step -
accuracy: 0.5000 - loss: 0.7002
Epoch 182/2000
1/1 0s 59ms/step -
accuracy: 0.5000 - loss: 0.7001
Epoch 183/2000
1/1 0s 61ms/step -
accuracy: 0.5000 - loss: 0.7000
Epoch 184/2000
1/1 0s 148ms/step -
accuracy: 0.5000 - loss: 0.6999
Epoch 185/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6997
Epoch 186/2000
1/1 0s 84ms/step -
accuracy: 0.5000 - loss: 0.6996
Epoch 187/2000
1/1 0s 71ms/step -
accuracy: 0.5000 - loss: 0.6995
Epoch 188/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6994
Epoch 189/2000
1/1 0s 48ms/step -

accuracy: 0.5000 - loss: 0.6993
Epoch 190/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6992
Epoch 191/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6990
Epoch 192/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6989
Epoch 193/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6988
Epoch 194/2000
1/1 0s 43ms/step -
accuracy: 0.5000 - loss: 0.6987
Epoch 195/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6986
Epoch 196/2000
1/1 0s 60ms/step -
accuracy: 0.5000 - loss: 0.6985
Epoch 197/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6984
Epoch 198/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.6983
Epoch 199/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6982
Epoch 200/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6981
Epoch 201/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6980
Epoch 202/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6979
Epoch 203/2000
1/1 0s 59ms/step -
accuracy: 0.5000 - loss: 0.6978
Epoch 204/2000
1/1 0s 73ms/step -
accuracy: 0.5000 - loss: 0.6977
Epoch 205/2000
1/1 0s 64ms/step -

accuracy: 0.5000 - loss: 0.6976
Epoch 206/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6975
Epoch 207/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6974
Epoch 208/2000
1/1 0s 60ms/step -
accuracy: 0.5000 - loss: 0.6973
Epoch 209/2000
1/1 0s 79ms/step -
accuracy: 0.5000 - loss: 0.6973
Epoch 210/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6972
Epoch 211/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6971
Epoch 212/2000
1/1 0s 84ms/step -
accuracy: 0.5000 - loss: 0.6970
Epoch 213/2000
1/1 0s 64ms/step -
accuracy: 0.5000 - loss: 0.6969
Epoch 214/2000
1/1 0s 83ms/step -
accuracy: 0.5000 - loss: 0.6968
Epoch 215/2000
1/1 0s 62ms/step -
accuracy: 0.5000 - loss: 0.6967
Epoch 216/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6967
Epoch 217/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6966
Epoch 218/2000
1/1 0s 65ms/step -
accuracy: 0.5000 - loss: 0.6965
Epoch 219/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6964
Epoch 220/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6964
Epoch 221/2000
1/1 0s 57ms/step -

accuracy: 0.5000 - loss: 0.6963
Epoch 222/2000
1/1 0s 43ms/step -
accuracy: 0.5000 - loss: 0.6962
Epoch 223/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6961
Epoch 224/2000
1/1 0s 68ms/step -
accuracy: 0.5000 - loss: 0.6961
Epoch 225/2000
1/1 0s 60ms/step -
accuracy: 0.5000 - loss: 0.6960
Epoch 226/2000
1/1 0s 129ms/step -
accuracy: 0.5000 - loss: 0.6959
Epoch 227/2000
1/1 0s 103ms/step -
accuracy: 0.5000 - loss: 0.6958
Epoch 228/2000
1/1 0s 94ms/step -
accuracy: 0.5000 - loss: 0.6958
Epoch 229/2000
1/1 0s 65ms/step -
accuracy: 0.5000 - loss: 0.6957
Epoch 230/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6956
Epoch 231/2000
1/1 0s 65ms/step -
accuracy: 0.5000 - loss: 0.6956
Epoch 232/2000
1/1 0s 59ms/step -
accuracy: 0.5000 - loss: 0.6955
Epoch 233/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6955
Epoch 234/2000
1/1 0s 62ms/step -
accuracy: 0.5000 - loss: 0.6954
Epoch 235/2000
1/1 0s 63ms/step -
accuracy: 0.5000 - loss: 0.6953
Epoch 236/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6953
Epoch 237/2000
1/1 0s 61ms/step -

accuracy: 0.5000 - loss: 0.6952
Epoch 238/2000
1/1 0s 69ms/step -
accuracy: 0.5000 - loss: 0.6951
Epoch 239/2000
1/1 0s 73ms/step -
accuracy: 0.5000 - loss: 0.6951
Epoch 240/2000
1/1 0s 60ms/step -
accuracy: 0.5000 - loss: 0.6950
Epoch 241/2000
1/1 0s 60ms/step -
accuracy: 0.5000 - loss: 0.6950
Epoch 242/2000
1/1 0s 91ms/step -
accuracy: 0.5000 - loss: 0.6949
Epoch 243/2000
1/1 0s 66ms/step -
accuracy: 0.5000 - loss: 0.6949
Epoch 244/2000
1/1 0s 61ms/step -
accuracy: 0.5000 - loss: 0.6948
Epoch 245/2000
1/1 0s 59ms/step -
accuracy: 0.5000 - loss: 0.6948
Epoch 246/2000
1/1 0s 65ms/step -
accuracy: 0.5000 - loss: 0.6947
Epoch 247/2000
1/1 0s 64ms/step -
accuracy: 0.5000 - loss: 0.6947
Epoch 248/2000
1/1 0s 69ms/step -
accuracy: 0.5000 - loss: 0.6946
Epoch 249/2000
1/1 0s 64ms/step -
accuracy: 0.5000 - loss: 0.6945
Epoch 250/2000
1/1 0s 70ms/step -
accuracy: 0.5000 - loss: 0.6945
Epoch 251/2000
1/1 0s 59ms/step -
accuracy: 0.5000 - loss: 0.6944
Epoch 252/2000
1/1 0s 72ms/step -
accuracy: 0.5000 - loss: 0.6944
Epoch 253/2000
1/1 0s 69ms/step -

accuracy: 0.5000 - loss: 0.6944
Epoch 254/2000
1/1 0s 92ms/step -
accuracy: 0.5000 - loss: 0.6943
Epoch 255/2000
1/1 0s 97ms/step -
accuracy: 0.5000 - loss: 0.6943
Epoch 256/2000
1/1 0s 98ms/step -
accuracy: 0.5000 - loss: 0.6942
Epoch 257/2000
1/1 0s 90ms/step -
accuracy: 0.5000 - loss: 0.6942
Epoch 258/2000
1/1 0s 76ms/step -
accuracy: 0.5000 - loss: 0.6941
Epoch 259/2000
1/1 0s 98ms/step -
accuracy: 0.5000 - loss: 0.6941
Epoch 260/2000
1/1 0s 78ms/step -
accuracy: 0.5000 - loss: 0.6940
Epoch 261/2000
1/1 0s 78ms/step -
accuracy: 0.5000 - loss: 0.6940
Epoch 262/2000
1/1 0s 76ms/step -
accuracy: 0.5000 - loss: 0.6940
Epoch 263/2000
1/1 0s 73ms/step -
accuracy: 0.5000 - loss: 0.6939
Epoch 264/2000
1/1 0s 81ms/step -
accuracy: 0.5000 - loss: 0.6939
Epoch 265/2000
1/1 0s 67ms/step -
accuracy: 0.5000 - loss: 0.6938
Epoch 266/2000
1/1 0s 69ms/step -
accuracy: 0.5000 - loss: 0.6938
Epoch 267/2000
1/1 0s 67ms/step -
accuracy: 0.5000 - loss: 0.6937
Epoch 268/2000
1/1 0s 76ms/step -
accuracy: 0.5000 - loss: 0.6937
Epoch 269/2000
1/1 0s 67ms/step -

accuracy: 0.5000 - loss: 0.6937
Epoch 270/2000
1/1 0s 72ms/step -
accuracy: 0.5000 - loss: 0.6936
Epoch 271/2000
1/1 0s 67ms/step -
accuracy: 0.5000 - loss: 0.6936
Epoch 272/2000
1/1 0s 71ms/step -
accuracy: 0.5000 - loss: 0.6936
Epoch 273/2000
1/1 0s 79ms/step -
accuracy: 0.2500 - loss: 0.6935
Epoch 274/2000
1/1 0s 65ms/step -
accuracy: 0.2500 - loss: 0.6935
Epoch 275/2000
1/1 0s 71ms/step -
accuracy: 0.2500 - loss: 0.6935
Epoch 276/2000
1/1 0s 76ms/step -
accuracy: 0.2500 - loss: 0.6934
Epoch 277/2000
1/1 0s 61ms/step -
accuracy: 0.2500 - loss: 0.6934
Epoch 278/2000
1/1 0s 60ms/step -
accuracy: 0.2500 - loss: 0.6934
Epoch 279/2000
1/1 0s 69ms/step -
accuracy: 0.2500 - loss: 0.6933
Epoch 280/2000
1/1 0s 52ms/step -
accuracy: 0.2500 - loss: 0.6933
Epoch 281/2000
1/1 0s 51ms/step -
accuracy: 0.2500 - loss: 0.6933
Epoch 282/2000
1/1 0s 51ms/step -
accuracy: 0.2500 - loss: 0.6932
Epoch 283/2000
1/1 0s 52ms/step -
accuracy: 0.2500 - loss: 0.6932
Epoch 284/2000
1/1 0s 49ms/step -
accuracy: 0.2500 - loss: 0.6932
Epoch 285/2000
1/1 0s 62ms/step -

accuracy: 0.2500 - loss: 0.6931
Epoch 286/2000
1/1 0s 60ms/step -
accuracy: 0.2500 - loss: 0.6931
Epoch 287/2000
1/1 0s 47ms/step -
accuracy: 0.2500 - loss: 0.6931
Epoch 288/2000
1/1 0s 50ms/step -
accuracy: 0.2500 - loss: 0.6930
Epoch 289/2000
1/1 0s 53ms/step -
accuracy: 0.2500 - loss: 0.6930
Epoch 290/2000
1/1 0s 50ms/step -
accuracy: 0.2500 - loss: 0.6930
Epoch 291/2000
1/1 0s 147ms/step -
accuracy: 0.2500 - loss: 0.6930
Epoch 292/2000
1/1 0s 53ms/step -
accuracy: 0.2500 - loss: 0.6929
Epoch 293/2000
1/1 0s 49ms/step -
accuracy: 0.2500 - loss: 0.6929
Epoch 294/2000
1/1 0s 49ms/step -
accuracy: 0.2500 - loss: 0.6929
Epoch 295/2000
1/1 0s 46ms/step -
accuracy: 0.2500 - loss: 0.6928
Epoch 296/2000
1/1 0s 58ms/step -
accuracy: 0.2500 - loss: 0.6928
Epoch 297/2000
1/1 0s 49ms/step -
accuracy: 0.2500 - loss: 0.6928
Epoch 298/2000
1/1 0s 51ms/step -
accuracy: 0.2500 - loss: 0.6928
Epoch 299/2000
1/1 0s 53ms/step -
accuracy: 0.2500 - loss: 0.6927
Epoch 300/2000
1/1 0s 47ms/step -
accuracy: 0.2500 - loss: 0.6927
Epoch 301/2000
1/1 0s 53ms/step -

accuracy: 0.2500 - loss: 0.6927
Epoch 302/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6927
Epoch 303/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6926
Epoch 304/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6926
Epoch 305/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6926
Epoch 306/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6926
Epoch 307/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6926
Epoch 308/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6925
Epoch 309/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6925
Epoch 310/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6925
Epoch 311/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6925
Epoch 312/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6924
Epoch 313/2000
1/1 0s 103ms/step -
accuracy: 0.5000 - loss: 0.6924
Epoch 314/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6924
Epoch 315/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6924
Epoch 316/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6924
Epoch 317/2000
1/1 0s 49ms/step -

accuracy: 0.5000 - loss: 0.6923
Epoch 318/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6923
Epoch 319/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6923
Epoch 320/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6923
Epoch 321/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6923
Epoch 322/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6922
Epoch 323/2000
1/1 0s 84ms/step -
accuracy: 0.5000 - loss: 0.6922
Epoch 324/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6922
Epoch 325/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6922
Epoch 326/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6922
Epoch 327/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6921
Epoch 328/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6921
Epoch 329/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6921
Epoch 330/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6921
Epoch 331/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6921
Epoch 332/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6921
Epoch 333/2000
1/1 0s 51ms/step -

accuracy: 0.5000 - loss: 0.6920
Epoch 334/2000
1/1 0s 105ms/step -
accuracy: 0.5000 - loss: 0.6920
Epoch 335/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6920
Epoch 336/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6920
Epoch 337/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6920
Epoch 338/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6920
Epoch 339/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6919
Epoch 340/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6919
Epoch 341/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6919
Epoch 342/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6919
Epoch 343/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6919
Epoch 344/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6919
Epoch 345/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6919
Epoch 346/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6918
Epoch 347/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6918
Epoch 348/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6918
Epoch 349/2000
1/1 0s 50ms/step -

accuracy: 0.5000 - loss: 0.6918
Epoch 350/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.6918
Epoch 351/2000
1/1 0s 57ms/step -
accuracy: 0.5000 - loss: 0.6918
Epoch 352/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6918
Epoch 353/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6917
Epoch 354/2000
1/1 0s 120ms/step -
accuracy: 0.5000 - loss: 0.6917
Epoch 355/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6917
Epoch 356/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6917
Epoch 357/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6917
Epoch 358/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6917
Epoch 359/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6917
Epoch 360/2000
1/1 0s 57ms/step -
accuracy: 0.5000 - loss: 0.6916
Epoch 361/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6916
Epoch 362/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6916
Epoch 363/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6916
Epoch 364/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6916
Epoch 365/2000
1/1 0s 44ms/step -

accuracy: 0.5000 - loss: 0.6916
Epoch 366/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.6916
Epoch 367/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.6916
Epoch 368/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6915
Epoch 369/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6915
Epoch 370/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6915
Epoch 371/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6915
Epoch 372/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6915
Epoch 373/2000
1/1 0s 92ms/step -
accuracy: 0.5000 - loss: 0.6915
Epoch 374/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6915
Epoch 375/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6915
Epoch 376/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6915
Epoch 377/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6914
Epoch 378/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6914
Epoch 379/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6914
Epoch 380/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6914
Epoch 381/2000
1/1 0s 48ms/step -

accuracy: 0.5000 - loss: 0.6914
Epoch 382/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6914
Epoch 383/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6914
Epoch 384/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6914
Epoch 385/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6913
Epoch 386/2000
1/1 0s 69ms/step -
accuracy: 0.5000 - loss: 0.6913
Epoch 387/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6913
Epoch 388/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6913
Epoch 389/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6913
Epoch 390/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6913
Epoch 391/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6913
Epoch 392/2000
1/1 0s 105ms/step -
accuracy: 0.5000 - loss: 0.6913
Epoch 393/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6913
Epoch 394/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6913
Epoch 395/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6912
Epoch 396/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6912
Epoch 397/2000
1/1 0s 50ms/step -

accuracy: 0.5000 - loss: 0.6912
Epoch 398/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6912
Epoch 399/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6912
Epoch 400/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6912
Epoch 401/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6912
Epoch 402/2000
1/1 0s 59ms/step -
accuracy: 0.5000 - loss: 0.6912
Epoch 403/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6912
Epoch 404/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6911
Epoch 405/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6911
Epoch 406/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6911
Epoch 407/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6911
Epoch 408/2000
1/1 0s 57ms/step -
accuracy: 0.5000 - loss: 0.6911
Epoch 409/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6911
Epoch 410/2000
1/1 0s 115ms/step -
accuracy: 0.5000 - loss: 0.6911
Epoch 411/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6911
Epoch 412/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6911
Epoch 413/2000
1/1 0s 58ms/step -

accuracy: 0.5000 - loss: 0.6911
Epoch 414/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6910
Epoch 415/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6910
Epoch 416/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6910
Epoch 417/2000
1/1 0s 73ms/step -
accuracy: 0.5000 - loss: 0.6910
Epoch 418/2000
1/1 0s 61ms/step -
accuracy: 0.5000 - loss: 0.6910
Epoch 419/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6910
Epoch 420/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6910
Epoch 421/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6910
Epoch 422/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6910
Epoch 423/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6910
Epoch 424/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6909
Epoch 425/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6909
Epoch 426/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6909
Epoch 427/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6909
Epoch 428/2000
1/1 0s 175ms/step -
accuracy: 0.5000 - loss: 0.6909
Epoch 429/2000
1/1 0s 51ms/step -

accuracy: 0.5000 - loss: 0.6909
Epoch 430/2000
1/1 0s 92ms/step -
accuracy: 0.5000 - loss: 0.6909
Epoch 431/2000
1/1 0s 63ms/step -
accuracy: 0.5000 - loss: 0.6909
Epoch 432/2000
1/1 0s 59ms/step -
accuracy: 0.5000 - loss: 0.6909
Epoch 433/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6909
Epoch 434/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6909
Epoch 435/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6908
Epoch 436/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6908
Epoch 437/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6908
Epoch 438/2000
1/1 0s 59ms/step -
accuracy: 0.5000 - loss: 0.6908
Epoch 439/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6908
Epoch 440/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6908
Epoch 441/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6908
Epoch 442/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6908
Epoch 443/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6908
Epoch 444/2000
1/1 0s 96ms/step -
accuracy: 0.5000 - loss: 0.6908
Epoch 445/2000
1/1 0s 47ms/step -

accuracy: 0.5000 - loss: 0.6907
Epoch 446/2000
1/1 0s 57ms/step -
accuracy: 0.5000 - loss: 0.6907
Epoch 447/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6907
Epoch 448/2000
1/1 0s 69ms/step -
accuracy: 0.5000 - loss: 0.6907
Epoch 449/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6907
Epoch 450/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6907
Epoch 451/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6907
Epoch 452/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6907
Epoch 453/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.6907
Epoch 454/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6907
Epoch 455/2000
1/1 0s 43ms/step -
accuracy: 0.5000 - loss: 0.6907
Epoch 456/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6906
Epoch 457/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6906
Epoch 458/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6906
Epoch 459/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.6906
Epoch 460/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6906
Epoch 461/2000
1/1 0s 44ms/step -

accuracy: 0.5000 - loss: 0.6906
Epoch 462/2000
1/1 0s 98ms/step -
accuracy: 0.5000 - loss: 0.6906
Epoch 463/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6906
Epoch 464/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6906
Epoch 465/2000
1/1 0s 66ms/step -
accuracy: 0.5000 - loss: 0.6906
Epoch 466/2000
1/1 0s 65ms/step -
accuracy: 0.5000 - loss: 0.6905
Epoch 467/2000
1/1 0s 74ms/step -
accuracy: 0.5000 - loss: 0.6905
Epoch 468/2000
1/1 0s 84ms/step -
accuracy: 0.5000 - loss: 0.6905
Epoch 469/2000
1/1 0s 83ms/step -
accuracy: 0.5000 - loss: 0.6905
Epoch 470/2000
1/1 0s 73ms/step -
accuracy: 0.5000 - loss: 0.6905
Epoch 471/2000
1/1 0s 73ms/step -
accuracy: 0.5000 - loss: 0.6905
Epoch 472/2000
1/1 0s 72ms/step -
accuracy: 0.5000 - loss: 0.6905
Epoch 473/2000
1/1 0s 68ms/step -
accuracy: 0.5000 - loss: 0.6905
Epoch 474/2000
1/1 0s 88ms/step -
accuracy: 0.5000 - loss: 0.6905
Epoch 475/2000
1/1 0s 69ms/step -
accuracy: 0.5000 - loss: 0.6905
Epoch 476/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6905
Epoch 477/2000
1/1 0s 60ms/step -

accuracy: 0.5000 - loss: 0.6904
Epoch 478/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6904
Epoch 479/2000
1/1 0s 59ms/step -
accuracy: 0.5000 - loss: 0.6904
Epoch 480/2000
1/1 0s 73ms/step -
accuracy: 0.5000 - loss: 0.6904
Epoch 481/2000
1/1 0s 65ms/step -
accuracy: 0.5000 - loss: 0.6904
Epoch 482/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6904
Epoch 483/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6904
Epoch 484/2000
1/1 0s 124ms/step -
accuracy: 0.5000 - loss: 0.6904
Epoch 485/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6904
Epoch 486/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6904
Epoch 487/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6903
Epoch 488/2000
1/1 0s 75ms/step -
accuracy: 0.5000 - loss: 0.6903
Epoch 489/2000
1/1 0s 105ms/step -
accuracy: 0.5000 - loss: 0.6903
Epoch 490/2000
1/1 0s 57ms/step -
accuracy: 0.5000 - loss: 0.6903
Epoch 491/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6903
Epoch 492/2000
1/1 0s 61ms/step -
accuracy: 0.5000 - loss: 0.6903
Epoch 493/2000
1/1 0s 65ms/step -

accuracy: 0.5000 - loss: 0.6903
Epoch 494/2000
1/1 0s 59ms/step -
accuracy: 0.5000 - loss: 0.6903
Epoch 495/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6903
Epoch 496/2000
1/1 0s 64ms/step -
accuracy: 0.5000 - loss: 0.6903
Epoch 497/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6902
Epoch 498/2000
1/1 0s 119ms/step -
accuracy: 0.5000 - loss: 0.6902
Epoch 499/2000
1/1 0s 64ms/step -
accuracy: 0.5000 - loss: 0.6902
Epoch 500/2000
1/1 0s 59ms/step -
accuracy: 0.5000 - loss: 0.6902
Epoch 501/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6902
Epoch 502/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6902
Epoch 503/2000
1/1 0s 62ms/step -
accuracy: 0.5000 - loss: 0.6902
Epoch 504/2000
1/1 0s 60ms/step -
accuracy: 0.5000 - loss: 0.6902
Epoch 505/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6902
Epoch 506/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6902
Epoch 507/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6901
Epoch 508/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6901
Epoch 509/2000
1/1 0s 63ms/step -

accuracy: 0.5000 - loss: 0.6901
Epoch 510/2000
1/1 0s 161ms/step -
accuracy: 0.5000 - loss: 0.6901
Epoch 511/2000
1/1 0s 74ms/step -
accuracy: 0.5000 - loss: 0.6901
Epoch 512/2000
1/1 0s 65ms/step -
accuracy: 0.5000 - loss: 0.6901
Epoch 513/2000
1/1 0s 133ms/step -
accuracy: 0.5000 - loss: 0.6901
Epoch 514/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6901
Epoch 515/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6901
Epoch 516/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6901
Epoch 517/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6900
Epoch 518/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6900
Epoch 519/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6900
Epoch 520/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.6900
Epoch 521/2000
1/1 0s 78ms/step -
accuracy: 0.5000 - loss: 0.6900
Epoch 522/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6900
Epoch 523/2000
1/1 0s 84ms/step -
accuracy: 0.5000 - loss: 0.6900
Epoch 524/2000
1/1 0s 61ms/step -
accuracy: 0.5000 - loss: 0.6900
Epoch 525/2000
1/1 0s 53ms/step -

```

accuracy: 0.5000 - loss: 0.6900
Epoch 526/2000
1/1          0s 50ms/step -
accuracy: 0.5000 - loss: 0.6899
Epoch 527/2000
1/1          0s 45ms/step -
accuracy: 0.5000 - loss: 0.6899
Epoch 528/2000
1/1          0s 46ms/step -
accuracy: 0.5000 - loss: 0.6899
Epoch 529/2000
1/1          0s 45ms/step -
accuracy: 0.5000 - loss: 0.6899
Epoch 530/2000
1/1          0s 48ms/step -
accuracy: 0.5000 - loss: 0.6899
Epoch 531/2000
1/1          0s 53ms/step -
accuracy: 0.5000 - loss: 0.6899
Epoch 532/2000
1/1          0s 55ms/step -
accuracy: 0.5000 - loss: 0.6899
Epoch 533/2000
1/1          0s 114ms/step -
accuracy: 0.5000 - loss: 0.6899
Epoch 534/2000
1/1          0s 50ms/step -
accuracy: 0.5000 - loss: 0.6899
Epoch 535/2000
1/1          0s 54ms/step -
accuracy: 0.5000 - loss: 0.6899
Epoch 536/2000
1/1          0s 48ms/step -
accuracy: 0.5000 - loss: 0.6898
Epoch 537/2000
1/1          0s 57ms/step -
accuracy: 0.5000 - loss: 0.6898
Epoch 538/2000
1/1          0s 47ms/step -
accuracy: 0.5000 - loss: 0.6898
Epoch 539/2000
1/1          0s 47ms/step -
accuracy: 0.5000 - loss: 0.6898
Epoch 540/2000
1/1          0s 47ms/step -
accuracy: 0.5000 - loss: 0.6898
Epoch 541/2000
1/1          0s 53ms/step -

```

accuracy: 0.5000 - loss: 0.6898
Epoch 542/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6898
Epoch 543/2000
1/1 0s 65ms/step -
accuracy: 0.5000 - loss: 0.6898
Epoch 544/2000
1/1 0s 62ms/step -
accuracy: 0.5000 - loss: 0.6898
Epoch 545/2000
1/1 0s 62ms/step -
accuracy: 0.5000 - loss: 0.6897
Epoch 546/2000
1/1 0s 149ms/step -
accuracy: 0.5000 - loss: 0.6897
Epoch 547/2000
1/1 0s 69ms/step -
accuracy: 0.5000 - loss: 0.6897
Epoch 548/2000
1/1 0s 65ms/step -
accuracy: 0.5000 - loss: 0.6897
Epoch 549/2000
1/1 0s 70ms/step -
accuracy: 0.5000 - loss: 0.6897
Epoch 550/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6897
Epoch 551/2000
1/1 0s 57ms/step -
accuracy: 0.5000 - loss: 0.6897
Epoch 552/2000
1/1 0s 61ms/step -
accuracy: 0.5000 - loss: 0.6897
Epoch 553/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6897
Epoch 554/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6896
Epoch 555/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6896
Epoch 556/2000
1/1 0s 62ms/step -
accuracy: 0.5000 - loss: 0.6896
Epoch 557/2000
1/1 0s 54ms/step -

accuracy: 0.5000 - loss: 0.6896
Epoch 558/2000
1/1 0s 57ms/step -
accuracy: 0.5000 - loss: 0.6896
Epoch 559/2000
1/1 0s 73ms/step -
accuracy: 0.5000 - loss: 0.6896
Epoch 560/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6896
Epoch 561/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6896
Epoch 562/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6896
Epoch 563/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6895
Epoch 564/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6895
Epoch 565/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6895
Epoch 566/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6895
Epoch 567/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6895
Epoch 568/2000
1/1 0s 100ms/step -
accuracy: 0.5000 - loss: 0.6895
Epoch 569/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6895
Epoch 570/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6895
Epoch 571/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6895
Epoch 572/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6894
Epoch 573/2000
1/1 0s 49ms/step -

accuracy: 0.5000 - loss: 0.6894
Epoch 574/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6894
Epoch 575/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6894
Epoch 576/2000
1/1 0s 73ms/step -
accuracy: 0.5000 - loss: 0.6894
Epoch 577/2000
1/1 0s 68ms/step -
accuracy: 0.5000 - loss: 0.6894
Epoch 578/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6894
Epoch 579/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6894
Epoch 580/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6893
Epoch 581/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6893
Epoch 582/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6893
Epoch 583/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6893
Epoch 584/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6893
Epoch 585/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6893
Epoch 586/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.6893
Epoch 587/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6893
Epoch 588/2000
1/1 0s 111ms/step -
accuracy: 0.5000 - loss: 0.6893
Epoch 589/2000
1/1 0s 47ms/step -

accuracy: 0.5000 - loss: 0.6892
Epoch 590/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6892
Epoch 591/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6892
Epoch 592/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6892
Epoch 593/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6892
Epoch 594/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6892
Epoch 595/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6892
Epoch 596/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6892
Epoch 597/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6891
Epoch 598/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6891
Epoch 599/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6891
Epoch 600/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6891
Epoch 601/2000
1/1 0s 94ms/step -
accuracy: 0.5000 - loss: 0.6891
Epoch 602/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6891
Epoch 603/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6891
Epoch 604/2000
1/1 0s 59ms/step -
accuracy: 0.5000 - loss: 0.6891
Epoch 605/2000
1/1 0s 51ms/step -

accuracy: 0.5000 - loss: 0.6890
Epoch 606/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6890
Epoch 607/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6890
Epoch 608/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6890
Epoch 609/2000
1/1 0s 61ms/step -
accuracy: 0.5000 - loss: 0.6890
Epoch 610/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6890
Epoch 611/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6890
Epoch 612/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6890
Epoch 613/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.6889
Epoch 614/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6889
Epoch 615/2000
1/1 0s 104ms/step -
accuracy: 0.5000 - loss: 0.6889
Epoch 616/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6889
Epoch 617/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6889
Epoch 618/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6889
Epoch 619/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6889
Epoch 620/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6888
Epoch 621/2000
1/1 0s 47ms/step -

accuracy: 0.5000 - loss: 0.6888
Epoch 622/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6888
Epoch 623/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6888
Epoch 624/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6888
Epoch 625/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6888
Epoch 626/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6888
Epoch 627/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6888
Epoch 628/2000
1/1 0s 97ms/step -
accuracy: 0.5000 - loss: 0.6887
Epoch 629/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6887
Epoch 630/2000
1/1 0s 60ms/step -
accuracy: 0.5000 - loss: 0.6887
Epoch 631/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6887
Epoch 632/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6887
Epoch 633/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6887
Epoch 634/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6887
Epoch 635/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6886
Epoch 636/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6886
Epoch 637/2000
1/1 0s 45ms/step -

accuracy: 0.5000 - loss: 0.6886
Epoch 638/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6886
Epoch 639/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6886
Epoch 640/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6886
Epoch 641/2000
1/1 0s 99ms/step -
accuracy: 0.5000 - loss: 0.6886
Epoch 642/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6885
Epoch 643/2000
1/1 0s 68ms/step -
accuracy: 0.5000 - loss: 0.6885
Epoch 644/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6885
Epoch 645/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6885
Epoch 646/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6885
Epoch 647/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6885
Epoch 648/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6885
Epoch 649/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6884
Epoch 650/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6884
Epoch 651/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6884
Epoch 652/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6884
Epoch 653/2000
1/1 0s 50ms/step -

accuracy: 0.5000 - loss: 0.6884
Epoch 654/2000
1/1 0s 105ms/step -
accuracy: 0.5000 - loss: 0.6884
Epoch 655/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6884
Epoch 656/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6883
Epoch 657/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6883
Epoch 658/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6883
Epoch 659/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6883
Epoch 660/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6883
Epoch 661/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6883
Epoch 662/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6883
Epoch 663/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6882
Epoch 664/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6882
Epoch 665/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6882
Epoch 666/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6882
Epoch 667/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6882
Epoch 668/2000
1/1 0s 43ms/step -
accuracy: 0.5000 - loss: 0.6882
Epoch 669/2000
1/1 0s 48ms/step -

accuracy: 0.5000 - loss: 0.6882
Epoch 670/2000
1/1 0s 80ms/step -
accuracy: 0.5000 - loss: 0.6881
Epoch 671/2000
1/1 0s 59ms/step -
accuracy: 0.5000 - loss: 0.6881
Epoch 672/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6881
Epoch 673/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6881
Epoch 674/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6881
Epoch 675/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6881
Epoch 676/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6880
Epoch 677/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6880
Epoch 678/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6880
Epoch 679/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6880
Epoch 680/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6880
Epoch 681/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6880
Epoch 682/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6880
Epoch 683/2000
1/1 0s 122ms/step -
accuracy: 0.5000 - loss: 0.6879
Epoch 684/2000
1/1 0s 62ms/step -
accuracy: 0.5000 - loss: 0.6879
Epoch 685/2000
1/1 0s 44ms/step -

accuracy: 0.5000 - loss: 0.6879
Epoch 686/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6879
Epoch 687/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6879
Epoch 688/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6879
Epoch 689/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6878
Epoch 690/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.6878
Epoch 691/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6878
Epoch 692/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6878
Epoch 693/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6878
Epoch 694/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6878
Epoch 695/2000
1/1 0s 101ms/step -
accuracy: 0.5000 - loss: 0.6877
Epoch 696/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6877
Epoch 697/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.6877
Epoch 698/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6877
Epoch 699/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6877
Epoch 700/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6877
Epoch 701/2000
1/1 0s 45ms/step -

accuracy: 0.5000 - loss: 0.6876
Epoch 702/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6876
Epoch 703/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6876
Epoch 704/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.6876
Epoch 705/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6876
Epoch 706/2000
1/1 0s 111ms/step -
accuracy: 0.5000 - loss: 0.6876
Epoch 707/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6875
Epoch 708/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6875
Epoch 709/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6875
Epoch 710/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.6875
Epoch 711/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.6875
Epoch 712/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6875
Epoch 713/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.6874
Epoch 714/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6874
Epoch 715/2000
1/1 0s 64ms/step -
accuracy: 0.5000 - loss: 0.6874
Epoch 716/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6874
Epoch 717/2000
1/1 0s 45ms/step -

accuracy: 0.5000 - loss: 0.6874
Epoch 718/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6873
Epoch 719/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6873
Epoch 720/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6873
Epoch 721/2000
1/1 0s 97ms/step -
accuracy: 0.5000 - loss: 0.6873
Epoch 722/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6873
Epoch 723/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6873
Epoch 724/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6872
Epoch 725/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6872
Epoch 726/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6872
Epoch 727/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6872
Epoch 728/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6872
Epoch 729/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6872
Epoch 730/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6871
Epoch 731/2000
1/1 0s 77ms/step -
accuracy: 0.5000 - loss: 0.6871
Epoch 732/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6871
Epoch 733/2000
1/1 0s 46ms/step -

accuracy: 0.5000 - loss: 0.6871
Epoch 734/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6871
Epoch 735/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6870
Epoch 736/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6870
Epoch 737/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6870
Epoch 738/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6870
Epoch 739/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6870
Epoch 740/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6869
Epoch 741/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6869
Epoch 742/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6869
Epoch 743/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6869
Epoch 744/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6869
Epoch 745/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6869
Epoch 746/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6868
Epoch 747/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6868
Epoch 748/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6868
Epoch 749/2000
1/1 0s 98ms/step -

accuracy: 0.5000 - loss: 0.6868
Epoch 750/2000
1/1 0s 60ms/step -
accuracy: 0.5000 - loss: 0.6868
Epoch 751/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6867
Epoch 752/2000
1/1 0s 60ms/step -
accuracy: 0.5000 - loss: 0.6867
Epoch 753/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.6867
Epoch 754/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6867
Epoch 755/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6867
Epoch 756/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6866
Epoch 757/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6866
Epoch 758/2000
1/1 0s 44ms/step -
accuracy: 0.5000 - loss: 0.6866
Epoch 759/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6866
Epoch 760/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6866
Epoch 761/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6865
Epoch 762/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6865
Epoch 763/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6865
Epoch 764/2000
1/1 0s 102ms/step -
accuracy: 0.5000 - loss: 0.6865
Epoch 765/2000
1/1 0s 49ms/step -

accuracy: 0.5000 - loss: 0.6865
Epoch 766/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6864
Epoch 767/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6864
Epoch 768/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6864
Epoch 769/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6864
Epoch 770/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6864
Epoch 771/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6863
Epoch 772/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6863
Epoch 773/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6863
Epoch 774/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6863
Epoch 775/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6862
Epoch 776/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6862
Epoch 777/2000
1/1 0s 101ms/step -
accuracy: 0.5000 - loss: 0.6862
Epoch 778/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6862
Epoch 779/2000
1/1 0s 60ms/step -
accuracy: 0.5000 - loss: 0.6862
Epoch 780/2000
1/1 0s 65ms/step -
accuracy: 0.5000 - loss: 0.6861
Epoch 781/2000
1/1 0s 51ms/step -

accuracy: 0.5000 - loss: 0.6861
Epoch 782/2000
1/1 0s 68ms/step -
accuracy: 0.5000 - loss: 0.6861
Epoch 783/2000
1/1 0s 64ms/step -
accuracy: 0.5000 - loss: 0.6861
Epoch 784/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6861
Epoch 785/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6860
Epoch 786/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6860
Epoch 787/2000
1/1 0s 57ms/step -
accuracy: 0.5000 - loss: 0.6860
Epoch 788/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6860
Epoch 789/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6859
Epoch 790/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6859
Epoch 791/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6859
Epoch 792/2000
1/1 0s 65ms/step -
accuracy: 0.5000 - loss: 0.6859
Epoch 793/2000
1/1 0s 67ms/step -
accuracy: 0.5000 - loss: 0.6859
Epoch 794/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6858
Epoch 795/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6858
Epoch 796/2000
1/1 0s 107ms/step -
accuracy: 0.5000 - loss: 0.6858
Epoch 797/2000
1/1 0s 44ms/step -

accuracy: 0.5000 - loss: 0.6858
Epoch 798/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6857
Epoch 799/2000
1/1 0s 43ms/step -
accuracy: 0.5000 - loss: 0.6857
Epoch 800/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6857
Epoch 801/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6857
Epoch 802/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6857
Epoch 803/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6856
Epoch 804/2000
1/1 0s 62ms/step -
accuracy: 0.5000 - loss: 0.6856
Epoch 805/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6856
Epoch 806/2000
1/1 0s 84ms/step -
accuracy: 0.5000 - loss: 0.6856
Epoch 807/2000
1/1 0s 70ms/step -
accuracy: 0.5000 - loss: 0.6855
Epoch 808/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6855
Epoch 809/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6855
Epoch 810/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6855
Epoch 811/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6854
Epoch 812/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6854
Epoch 813/2000
1/1 0s 45ms/step -

accuracy: 0.5000 - loss: 0.6854
Epoch 814/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6854
Epoch 815/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6853
Epoch 816/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6853
Epoch 817/2000
1/1 0s 57ms/step -
accuracy: 0.5000 - loss: 0.6853
Epoch 818/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6853
Epoch 819/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6853
Epoch 820/2000
1/1 0s 59ms/step -
accuracy: 0.5000 - loss: 0.6852
Epoch 821/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6852
Epoch 822/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6852
Epoch 823/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6852
Epoch 824/2000
1/1 0s 101ms/step -
accuracy: 0.5000 - loss: 0.6851
Epoch 825/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6851
Epoch 826/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6851
Epoch 827/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6851
Epoch 828/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6850
Epoch 829/2000
1/1 0s 49ms/step -

accuracy: 0.5000 - loss: 0.6850
Epoch 830/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6850
Epoch 831/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6850
Epoch 832/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6849
Epoch 833/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6849
Epoch 834/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6849
Epoch 835/2000
1/1 0s 108ms/step -
accuracy: 0.5000 - loss: 0.6849
Epoch 836/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6848
Epoch 837/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6848
Epoch 838/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6848
Epoch 839/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6848
Epoch 840/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6847
Epoch 841/2000
1/1 0s 87ms/step -
accuracy: 0.5000 - loss: 0.6847
Epoch 842/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6847
Epoch 843/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6846
Epoch 844/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6846
Epoch 845/2000
1/1 0s 60ms/step -

accuracy: 0.5000 - loss: 0.6846
Epoch 846/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6846
Epoch 847/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6845
Epoch 848/2000
1/1 0s 172ms/step -
accuracy: 0.5000 - loss: 0.6845
Epoch 849/2000
1/1 0s 65ms/step -
accuracy: 0.5000 - loss: 0.6845
Epoch 850/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6845
Epoch 851/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6844
Epoch 852/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6844
Epoch 853/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6844
Epoch 854/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6844
Epoch 855/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6843
Epoch 856/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6843
Epoch 857/2000
1/1 0s 108ms/step -
accuracy: 0.5000 - loss: 0.6843
Epoch 858/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6842
Epoch 859/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6842
Epoch 860/2000
1/1 0s 66ms/step -
accuracy: 0.5000 - loss: 0.6842
Epoch 861/2000
1/1 0s 73ms/step -

accuracy: 0.5000 - loss: 0.6842
Epoch 862/2000
1/1 0s 66ms/step -
accuracy: 0.5000 - loss: 0.6841
Epoch 863/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6841
Epoch 864/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6841
Epoch 865/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6841
Epoch 866/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6840
Epoch 867/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6840
Epoch 868/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6840
Epoch 869/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6839
Epoch 870/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6839
Epoch 871/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6839
Epoch 872/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6839
Epoch 873/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6838
Epoch 874/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6838
Epoch 875/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6838
Epoch 876/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6837
Epoch 877/2000
1/1 0s 51ms/step -

accuracy: 0.5000 - loss: 0.6837
Epoch 878/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6837
Epoch 879/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6836
Epoch 880/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6836
Epoch 881/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6836
Epoch 882/2000
1/1 0s 64ms/step -
accuracy: 0.5000 - loss: 0.6836
Epoch 883/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6835
Epoch 884/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6835
Epoch 885/2000
1/1 0s 60ms/step -
accuracy: 0.5000 - loss: 0.6835
Epoch 886/2000
1/1 0s 79ms/step -
accuracy: 0.5000 - loss: 0.6834
Epoch 887/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6834
Epoch 888/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6834
Epoch 889/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6834
Epoch 890/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6833
Epoch 891/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6833
Epoch 892/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6833
Epoch 893/2000
1/1 0s 54ms/step -

accuracy: 0.5000 - loss: 0.6832
Epoch 894/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6832
Epoch 895/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6832
Epoch 896/2000
1/1 0s 106ms/step -
accuracy: 0.5000 - loss: 0.6831
Epoch 897/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6831
Epoch 898/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6831
Epoch 899/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6830
Epoch 900/2000
1/1 0s 60ms/step -
accuracy: 0.5000 - loss: 0.6830
Epoch 901/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6830
Epoch 902/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6829
Epoch 903/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6829
Epoch 904/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6829
Epoch 905/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6829
Epoch 906/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6828
Epoch 907/2000
1/1 0s 59ms/step -
accuracy: 0.5000 - loss: 0.6828
Epoch 908/2000
1/1 0s 71ms/step -
accuracy: 0.5000 - loss: 0.6828
Epoch 909/2000
1/1 0s 51ms/step -

accuracy: 0.5000 - loss: 0.6827
Epoch 910/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6827
Epoch 911/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6827
Epoch 912/2000
1/1 0s 72ms/step -
accuracy: 0.5000 - loss: 0.6826
Epoch 913/2000
1/1 0s 63ms/step -
accuracy: 0.5000 - loss: 0.6826
Epoch 914/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6826
Epoch 915/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6825
Epoch 916/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6825
Epoch 917/2000
1/1 0s 81ms/step -
accuracy: 0.5000 - loss: 0.6825
Epoch 918/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6824
Epoch 919/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6824
Epoch 920/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6824
Epoch 921/2000
1/1 0s 76ms/step -
accuracy: 0.5000 - loss: 0.6823
Epoch 922/2000
1/1 0s 64ms/step -
accuracy: 0.5000 - loss: 0.6823
Epoch 923/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6823
Epoch 924/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6822
Epoch 925/2000
1/1 0s 48ms/step -

accuracy: 0.5000 - loss: 0.6822
Epoch 926/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6822
Epoch 927/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6821
Epoch 928/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6821
Epoch 929/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6821
Epoch 930/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6820
Epoch 931/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6820
Epoch 932/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6820
Epoch 933/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6819
Epoch 934/2000
1/1 0s 88ms/step -
accuracy: 0.5000 - loss: 0.6819
Epoch 935/2000
1/1 0s 66ms/step -
accuracy: 0.5000 - loss: 0.6819
Epoch 936/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6818
Epoch 937/2000
1/1 0s 57ms/step -
accuracy: 0.5000 - loss: 0.6818
Epoch 938/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6817
Epoch 939/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6817
Epoch 940/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6817
Epoch 941/2000
1/1 0s 52ms/step -

accuracy: 0.5000 - loss: 0.6816
Epoch 942/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6816
Epoch 943/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6816
Epoch 944/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6815
Epoch 945/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6815
Epoch 946/2000
1/1 0s 60ms/step -
accuracy: 0.5000 - loss: 0.6815
Epoch 947/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6814
Epoch 948/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6814
Epoch 949/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6814
Epoch 950/2000
1/1 0s 67ms/step -
accuracy: 0.5000 - loss: 0.6813
Epoch 951/2000
1/1 0s 67ms/step -
accuracy: 0.5000 - loss: 0.6813
Epoch 952/2000
1/1 0s 71ms/step -
accuracy: 0.5000 - loss: 0.6812
Epoch 953/2000
1/1 0s 78ms/step -
accuracy: 0.5000 - loss: 0.6812
Epoch 954/2000
1/1 0s 82ms/step -
accuracy: 0.5000 - loss: 0.6812
Epoch 955/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6811
Epoch 956/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6811
Epoch 957/2000
1/1 0s 50ms/step -

accuracy: 0.5000 - loss: 0.6811
Epoch 958/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6810
Epoch 959/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6810
Epoch 960/2000
1/1 0s 57ms/step -
accuracy: 0.5000 - loss: 0.6809
Epoch 961/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6809
Epoch 962/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6809
Epoch 963/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6808
Epoch 964/2000
1/1 0s 120ms/step -
accuracy: 0.5000 - loss: 0.6808
Epoch 965/2000
1/1 0s 60ms/step -
accuracy: 0.5000 - loss: 0.6808
Epoch 966/2000
1/1 0s 74ms/step -
accuracy: 0.5000 - loss: 0.6807
Epoch 967/2000
1/1 0s 65ms/step -
accuracy: 0.5000 - loss: 0.6807
Epoch 968/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6806
Epoch 969/2000
1/1 0s 66ms/step -
accuracy: 0.5000 - loss: 0.6806
Epoch 970/2000
1/1 0s 79ms/step -
accuracy: 0.5000 - loss: 0.6806
Epoch 971/2000
1/1 0s 86ms/step -
accuracy: 0.5000 - loss: 0.6805
Epoch 972/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6805
Epoch 973/2000
1/1 0s 48ms/step -

accuracy: 0.5000 - loss: 0.6804
Epoch 974/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6804
Epoch 975/2000
1/1 0s 57ms/step -
accuracy: 0.5000 - loss: 0.6804
Epoch 976/2000
1/1 0s 61ms/step -
accuracy: 0.5000 - loss: 0.6803
Epoch 977/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6803
Epoch 978/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6802
Epoch 979/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6802
Epoch 980/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6802
Epoch 981/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6801
Epoch 982/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6801
Epoch 983/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6800
Epoch 984/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6800
Epoch 985/2000
1/1 0s 60ms/step -
accuracy: 0.5000 - loss: 0.6800
Epoch 986/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6799
Epoch 987/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6799
Epoch 988/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6798
Epoch 989/2000
1/1 0s 55ms/step -

accuracy: 0.5000 - loss: 0.6798
Epoch 990/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6798
Epoch 991/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6797
Epoch 992/2000
1/1 0s 45ms/step -
accuracy: 0.5000 - loss: 0.6797
Epoch 993/2000
1/1 0s 111ms/step -
accuracy: 0.5000 - loss: 0.6796
Epoch 994/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6796
Epoch 995/2000
1/1 0s 57ms/step -
accuracy: 0.5000 - loss: 0.6795
Epoch 996/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6795
Epoch 997/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6795
Epoch 998/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6794
Epoch 999/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6794
Epoch 1000/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6793
Epoch 1001/2000
1/1 0s 61ms/step -
accuracy: 0.5000 - loss: 0.6793
Epoch 1002/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6792
Epoch 1003/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6792
Epoch 1004/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6792
Epoch 1005/2000
1/1 0s 48ms/step -

accuracy: 0.5000 - loss: 0.6791
Epoch 1006/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6791
Epoch 1007/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6790
Epoch 1008/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6790
Epoch 1009/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6789
Epoch 1010/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6789
Epoch 1011/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6788
Epoch 1012/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6788
Epoch 1013/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6788
Epoch 1014/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6787
Epoch 1015/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6787
Epoch 1016/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6786
Epoch 1017/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6786
Epoch 1018/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6785
Epoch 1019/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6785
Epoch 1020/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6784
Epoch 1021/2000
1/1 0s 54ms/step -

accuracy: 0.5000 - loss: 0.6784
Epoch 1022/2000
1/1 0s 71ms/step -
accuracy: 0.5000 - loss: 0.6784
Epoch 1023/2000
1/1 0s 59ms/step -
accuracy: 0.5000 - loss: 0.6783
Epoch 1024/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6783
Epoch 1025/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6782
Epoch 1026/2000
1/1 0s 59ms/step -
accuracy: 0.5000 - loss: 0.6782
Epoch 1027/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6781
Epoch 1028/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6781
Epoch 1029/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6780
Epoch 1030/2000
1/1 0s 93ms/step -
accuracy: 0.5000 - loss: 0.6780
Epoch 1031/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6779
Epoch 1032/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6779
Epoch 1033/2000
1/1 0s 65ms/step -
accuracy: 0.5000 - loss: 0.6778
Epoch 1034/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6778
Epoch 1035/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6777
Epoch 1036/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6777
Epoch 1037/2000
1/1 0s 47ms/step -

accuracy: 0.5000 - loss: 0.6776
Epoch 1038/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6776
Epoch 1039/2000
1/1 0s 57ms/step -
accuracy: 0.5000 - loss: 0.6775
Epoch 1040/2000
1/1 0s 61ms/step -
accuracy: 0.5000 - loss: 0.6775
Epoch 1041/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6775
Epoch 1042/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6774
Epoch 1043/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6774
Epoch 1044/2000
1/1 0s 76ms/step -
accuracy: 0.5000 - loss: 0.6773
Epoch 1045/2000
1/1 0s 58ms/step -
accuracy: 0.5000 - loss: 0.6773
Epoch 1046/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6772
Epoch 1047/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6772
Epoch 1048/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6771
Epoch 1049/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6771
Epoch 1050/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6770
Epoch 1051/2000
1/1 0s 46ms/step -
accuracy: 0.5000 - loss: 0.6770
Epoch 1052/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6769
Epoch 1053/2000
1/1 0s 47ms/step -

accuracy: 0.5000 - loss: 0.6769
Epoch 1054/2000
1/1 0s 108ms/step -
accuracy: 0.5000 - loss: 0.6768
Epoch 1055/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6768
Epoch 1056/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6767
Epoch 1057/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6767
Epoch 1058/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6766
Epoch 1059/2000
1/1 0s 47ms/step -
accuracy: 0.5000 - loss: 0.6765
Epoch 1060/2000
1/1 0s 59ms/step -
accuracy: 0.5000 - loss: 0.6765
Epoch 1061/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6764
Epoch 1062/2000
1/1 0s 127ms/step -
accuracy: 0.5000 - loss: 0.6764
Epoch 1063/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6763
Epoch 1064/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6763
Epoch 1065/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6762
Epoch 1066/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6762
Epoch 1067/2000
1/1 0s 72ms/step -
accuracy: 0.5000 - loss: 0.6761
Epoch 1068/2000
1/1 0s 90ms/step -
accuracy: 0.5000 - loss: 0.6761
Epoch 1069/2000
1/1 0s 65ms/step -

accuracy: 0.5000 - loss: 0.6760
Epoch 1070/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6760
Epoch 1071/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6759
Epoch 1072/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6759
Epoch 1073/2000
1/1 0s 88ms/step -
accuracy: 0.5000 - loss: 0.6758
Epoch 1074/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6758
Epoch 1075/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6757
Epoch 1076/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6757
Epoch 1077/2000
1/1 0s 48ms/step -
accuracy: 0.5000 - loss: 0.6756
Epoch 1078/2000
1/1 0s 57ms/step -
accuracy: 0.5000 - loss: 0.6755
Epoch 1079/2000
1/1 0s 54ms/step -
accuracy: 0.5000 - loss: 0.6755
Epoch 1080/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6754
Epoch 1081/2000
1/1 0s 49ms/step -
accuracy: 0.5000 - loss: 0.6754
Epoch 1082/2000
1/1 0s 52ms/step -
accuracy: 0.5000 - loss: 0.6753
Epoch 1083/2000
1/1 0s 79ms/step -
accuracy: 0.5000 - loss: 0.6753
Epoch 1084/2000
1/1 0s 65ms/step -
accuracy: 0.5000 - loss: 0.6752
Epoch 1085/2000
1/1 0s 57ms/step -

accuracy: 0.5000 - loss: 0.6752
Epoch 1086/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6751
Epoch 1087/2000
1/1 0s 57ms/step -
accuracy: 0.5000 - loss: 0.6750
Epoch 1088/2000
1/1 0s 51ms/step -
accuracy: 0.5000 - loss: 0.6750
Epoch 1089/2000
1/1 0s 61ms/step -
accuracy: 0.5000 - loss: 0.6749
Epoch 1090/2000
1/1 0s 61ms/step -
accuracy: 0.5000 - loss: 0.6749
Epoch 1091/2000
1/1 0s 53ms/step -
accuracy: 0.5000 - loss: 0.6748
Epoch 1092/2000
1/1 0s 57ms/step -
accuracy: 0.5000 - loss: 0.6748
Epoch 1093/2000
1/1 0s 50ms/step -
accuracy: 0.5000 - loss: 0.6747
Epoch 1094/2000
1/1 0s 55ms/step -
accuracy: 0.5000 - loss: 0.6746
Epoch 1095/2000
1/1 0s 56ms/step -
accuracy: 0.5000 - loss: 0.6746
Epoch 1096/2000
1/1 0s 57ms/step -
accuracy: 0.7500 - loss: 0.6745
Epoch 1097/2000
1/1 0s 60ms/step -
accuracy: 0.7500 - loss: 0.6745
Epoch 1098/2000
1/1 0s 52ms/step -
accuracy: 0.7500 - loss: 0.6744
Epoch 1099/2000
1/1 0s 52ms/step -
accuracy: 0.7500 - loss: 0.6744
Epoch 1100/2000
1/1 0s 111ms/step -
accuracy: 0.7500 - loss: 0.6743
Epoch 1101/2000
1/1 0s 51ms/step -

accuracy: 0.7500 - loss: 0.6742
Epoch 1102/2000
1/1 0s 50ms/step -
accuracy: 0.7500 - loss: 0.6742
Epoch 1103/2000
1/1 0s 56ms/step -
accuracy: 0.7500 - loss: 0.6741
Epoch 1104/2000
1/1 0s 55ms/step -
accuracy: 0.7500 - loss: 0.6741
Epoch 1105/2000
1/1 0s 55ms/step -
accuracy: 0.7500 - loss: 0.6740
Epoch 1106/2000
1/1 0s 76ms/step -
accuracy: 0.7500 - loss: 0.6739
Epoch 1107/2000
1/1 0s 54ms/step -
accuracy: 0.7500 - loss: 0.6739
Epoch 1108/2000
1/1 0s 64ms/step -
accuracy: 0.7500 - loss: 0.6738
Epoch 1109/2000
1/1 0s 68ms/step -
accuracy: 0.7500 - loss: 0.6738
Epoch 1110/2000
1/1 0s 61ms/step -
accuracy: 0.7500 - loss: 0.6737
Epoch 1111/2000
1/1 0s 67ms/step -
accuracy: 0.7500 - loss: 0.6736
Epoch 1112/2000
1/1 0s 71ms/step -
accuracy: 0.7500 - loss: 0.6736
Epoch 1113/2000
1/1 0s 67ms/step -
accuracy: 0.7500 - loss: 0.6735
Epoch 1114/2000
1/1 0s 66ms/step -
accuracy: 0.7500 - loss: 0.6735
Epoch 1115/2000
1/1 0s 177ms/step -
accuracy: 0.7500 - loss: 0.6734
Epoch 1116/2000
1/1 1s 931ms/step -
accuracy: 0.7500 - loss: 0.6733
Epoch 1117/2000
1/1 0s 202ms/step -

accuracy: 0.7500 - loss: 0.6733
Epoch 1118/2000
1/1 0s 265ms/step -
accuracy: 0.7500 - loss: 0.6732
Epoch 1119/2000
1/1 0s 354ms/step -
accuracy: 0.7500 - loss: 0.6732
Epoch 1120/2000
1/1 0s 224ms/step -
accuracy: 0.7500 - loss: 0.6731
Epoch 1121/2000
1/1 0s 117ms/step -
accuracy: 0.7500 - loss: 0.6730
Epoch 1122/2000
1/1 0s 136ms/step -
accuracy: 0.7500 - loss: 0.6730
Epoch 1123/2000
1/1 0s 250ms/step -
accuracy: 0.7500 - loss: 0.6729
Epoch 1124/2000
1/1 0s 291ms/step -
accuracy: 0.7500 - loss: 0.6728
Epoch 1125/2000
1/1 0s 254ms/step -
accuracy: 0.7500 - loss: 0.6728
Epoch 1126/2000
1/1 0s 109ms/step -
accuracy: 0.7500 - loss: 0.6727
Epoch 1127/2000
1/1 0s 145ms/step -
accuracy: 0.7500 - loss: 0.6727
Epoch 1128/2000
1/1 0s 117ms/step -
accuracy: 0.7500 - loss: 0.6726
Epoch 1129/2000
1/1 0s 196ms/step -
accuracy: 0.7500 - loss: 0.6725
Epoch 1130/2000
1/1 0s 138ms/step -
accuracy: 0.7500 - loss: 0.6725
Epoch 1131/2000
1/1 0s 424ms/step -
accuracy: 0.7500 - loss: 0.6724
Epoch 1132/2000
1/1 0s 176ms/step -
accuracy: 0.7500 - loss: 0.6723
Epoch 1133/2000
1/1 0s 345ms/step -

accuracy: 0.7500 - loss: 0.6723
Epoch 1134/2000
1/1 0s 151ms/step -
accuracy: 0.7500 - loss: 0.6722
Epoch 1135/2000
1/1 0s 164ms/step -
accuracy: 0.7500 - loss: 0.6721
Epoch 1136/2000
1/1 0s 178ms/step -
accuracy: 0.7500 - loss: 0.6721
Epoch 1137/2000
1/1 0s 260ms/step -
accuracy: 0.7500 - loss: 0.6720
Epoch 1138/2000
1/1 0s 353ms/step -
accuracy: 0.7500 - loss: 0.6719
Epoch 1139/2000
1/1 0s 124ms/step -
accuracy: 0.7500 - loss: 0.6719
Epoch 1140/2000
1/1 0s 124ms/step -
accuracy: 0.7500 - loss: 0.6718
Epoch 1141/2000
1/1 0s 181ms/step -
accuracy: 0.7500 - loss: 0.6717
Epoch 1142/2000
1/1 0s 120ms/step -
accuracy: 0.7500 - loss: 0.6717
Epoch 1143/2000
1/1 0s 187ms/step -
accuracy: 0.7500 - loss: 0.6716
Epoch 1144/2000
1/1 0s 159ms/step -
accuracy: 0.7500 - loss: 0.6715
Epoch 1145/2000
1/1 0s 118ms/step -
accuracy: 0.7500 - loss: 0.6715
Epoch 1146/2000
1/1 0s 189ms/step -
accuracy: 0.7500 - loss: 0.6714
Epoch 1147/2000
1/1 0s 153ms/step -
accuracy: 0.7500 - loss: 0.6713
Epoch 1148/2000
1/1 0s 133ms/step -
accuracy: 0.7500 - loss: 0.6713
Epoch 1149/2000
1/1 0s 120ms/step -

accuracy: 0.7500 - loss: 0.6712
Epoch 1150/2000
1/1 0s 152ms/step -
accuracy: 0.7500 - loss: 0.6711
Epoch 1151/2000
1/1 0s 123ms/step -
accuracy: 0.7500 - loss: 0.6711
Epoch 1152/2000
1/1 0s 174ms/step -
accuracy: 0.7500 - loss: 0.6710
Epoch 1153/2000
1/1 0s 232ms/step -
accuracy: 0.7500 - loss: 0.6709
Epoch 1154/2000
1/1 1s 671ms/step -
accuracy: 0.7500 - loss: 0.6709
Epoch 1155/2000
1/1 0s 279ms/step -
accuracy: 0.7500 - loss: 0.6708
Epoch 1156/2000
1/1 0s 167ms/step -
accuracy: 0.7500 - loss: 0.6707
Epoch 1157/2000
1/1 0s 101ms/step -
accuracy: 0.7500 - loss: 0.6707
Epoch 1158/2000
1/1 0s 116ms/step -
accuracy: 0.7500 - loss: 0.6706
Epoch 1159/2000
1/1 0s 107ms/step -
accuracy: 0.7500 - loss: 0.6705
Epoch 1160/2000
1/1 0s 115ms/step -
accuracy: 0.7500 - loss: 0.6705
Epoch 1161/2000
1/1 0s 108ms/step -
accuracy: 0.7500 - loss: 0.6704
Epoch 1162/2000
1/1 0s 371ms/step -
accuracy: 0.7500 - loss: 0.6703
Epoch 1163/2000
1/1 0s 136ms/step -
accuracy: 0.7500 - loss: 0.6702
Epoch 1164/2000
1/1 0s 172ms/step -
accuracy: 0.7500 - loss: 0.6702
Epoch 1165/2000
1/1 0s 159ms/step -

accuracy: 0.7500 - loss: 0.6701
Epoch 1166/2000
1/1 0s 143ms/step -
accuracy: 0.7500 - loss: 0.6700
Epoch 1167/2000
1/1 0s 159ms/step -
accuracy: 0.7500 - loss: 0.6700
Epoch 1168/2000
1/1 0s 127ms/step -
accuracy: 0.7500 - loss: 0.6699
Epoch 1169/2000
1/1 0s 187ms/step -
accuracy: 0.7500 - loss: 0.6698
Epoch 1170/2000
1/1 0s 112ms/step -
accuracy: 0.7500 - loss: 0.6697
Epoch 1171/2000
1/1 0s 127ms/step -
accuracy: 0.7500 - loss: 0.6697
Epoch 1172/2000
1/1 0s 91ms/step -
accuracy: 0.7500 - loss: 0.6696
Epoch 1173/2000
1/1 0s 91ms/step -
accuracy: 0.7500 - loss: 0.6695
Epoch 1174/2000
1/1 0s 94ms/step -
accuracy: 0.7500 - loss: 0.6695
Epoch 1175/2000
1/1 0s 118ms/step -
accuracy: 0.7500 - loss: 0.6694
Epoch 1176/2000
1/1 0s 106ms/step -
accuracy: 0.7500 - loss: 0.6693
Epoch 1177/2000
1/1 0s 118ms/step -
accuracy: 0.7500 - loss: 0.6692
Epoch 1178/2000
1/1 0s 216ms/step -
accuracy: 0.7500 - loss: 0.6692
Epoch 1179/2000
1/1 0s 110ms/step -
accuracy: 0.7500 - loss: 0.6691
Epoch 1180/2000
1/1 0s 110ms/step -
accuracy: 0.7500 - loss: 0.6690
Epoch 1181/2000
1/1 0s 140ms/step -

accuracy: 0.7500 - loss: 0.6689
Epoch 1182/2000
1/1 0s 162ms/step -
accuracy: 0.7500 - loss: 0.6689
Epoch 1183/2000
1/1 0s 148ms/step -
accuracy: 0.7500 - loss: 0.6688
Epoch 1184/2000
1/1 0s 179ms/step -
accuracy: 0.7500 - loss: 0.6687
Epoch 1185/2000
1/1 0s 98ms/step -
accuracy: 0.7500 - loss: 0.6686
Epoch 1186/2000
1/1 0s 206ms/step -
accuracy: 0.7500 - loss: 0.6686
Epoch 1187/2000
1/1 0s 145ms/step -
accuracy: 0.7500 - loss: 0.6685
Epoch 1188/2000
1/1 0s 88ms/step -
accuracy: 0.7500 - loss: 0.6684
Epoch 1189/2000
1/1 0s 77ms/step -
accuracy: 0.7500 - loss: 0.6683
Epoch 1190/2000
1/1 0s 90ms/step -
accuracy: 0.7500 - loss: 0.6683
Epoch 1191/2000
1/1 0s 86ms/step -
accuracy: 0.7500 - loss: 0.6682
Epoch 1192/2000
1/1 0s 102ms/step -
accuracy: 0.7500 - loss: 0.6681
Epoch 1193/2000
1/1 0s 101ms/step -
accuracy: 0.7500 - loss: 0.6680
Epoch 1194/2000
1/1 0s 91ms/step -
accuracy: 0.7500 - loss: 0.6679
Epoch 1195/2000
1/1 0s 106ms/step -
accuracy: 0.7500 - loss: 0.6679
Epoch 1196/2000
1/1 0s 144ms/step -
accuracy: 0.7500 - loss: 0.6678
Epoch 1197/2000
1/1 0s 91ms/step -

accuracy: 0.7500 - loss: 0.6677
Epoch 1198/2000
1/1 0s 72ms/step -
accuracy: 0.7500 - loss: 0.6676
Epoch 1199/2000
1/1 0s 76ms/step -
accuracy: 0.7500 - loss: 0.6676
Epoch 1200/2000
1/1 0s 78ms/step -
accuracy: 0.7500 - loss: 0.6675
Epoch 1201/2000
1/1 0s 79ms/step -
accuracy: 0.7500 - loss: 0.6674
Epoch 1202/2000
1/1 0s 72ms/step -
accuracy: 0.7500 - loss: 0.6673
Epoch 1203/2000
1/1 0s 70ms/step -
accuracy: 0.7500 - loss: 0.6672
Epoch 1204/2000
1/1 0s 124ms/step -
accuracy: 0.7500 - loss: 0.6672
Epoch 1205/2000
1/1 0s 77ms/step -
accuracy: 0.7500 - loss: 0.6671
Epoch 1206/2000
1/1 0s 79ms/step -
accuracy: 0.7500 - loss: 0.6670
Epoch 1207/2000
1/1 0s 78ms/step -
accuracy: 0.7500 - loss: 0.6669
Epoch 1208/2000
1/1 0s 81ms/step -
accuracy: 0.7500 - loss: 0.6668
Epoch 1209/2000
1/1 0s 81ms/step -
accuracy: 0.7500 - loss: 0.6668
Epoch 1210/2000
1/1 0s 70ms/step -
accuracy: 0.7500 - loss: 0.6667
Epoch 1211/2000
1/1 0s 80ms/step -
accuracy: 0.7500 - loss: 0.6666
Epoch 1212/2000
1/1 0s 70ms/step -
accuracy: 0.7500 - loss: 0.6665
Epoch 1213/2000
1/1 0s 126ms/step -

accuracy: 0.7500 - loss: 0.6664
Epoch 1214/2000
1/1 0s 79ms/step -
accuracy: 0.7500 - loss: 0.6664
Epoch 1215/2000
1/1 0s 69ms/step -
accuracy: 0.7500 - loss: 0.6663
Epoch 1216/2000
1/1 0s 69ms/step -
accuracy: 0.7500 - loss: 0.6662
Epoch 1217/2000
1/1 0s 77ms/step -
accuracy: 0.7500 - loss: 0.6661
Epoch 1218/2000
1/1 0s 75ms/step -
accuracy: 0.7500 - loss: 0.6660
Epoch 1219/2000
1/1 0s 71ms/step -
accuracy: 0.7500 - loss: 0.6659
Epoch 1220/2000
1/1 0s 75ms/step -
accuracy: 0.7500 - loss: 0.6659
Epoch 1221/2000
1/1 0s 70ms/step -
accuracy: 0.7500 - loss: 0.6658
Epoch 1222/2000
1/1 0s 177ms/step -
accuracy: 0.7500 - loss: 0.6657
Epoch 1223/2000
1/1 0s 81ms/step -
accuracy: 0.7500 - loss: 0.6656
Epoch 1224/2000
1/1 0s 74ms/step -
accuracy: 0.7500 - loss: 0.6655
Epoch 1225/2000
1/1 0s 68ms/step -
accuracy: 0.7500 - loss: 0.6654
Epoch 1226/2000
1/1 0s 63ms/step -
accuracy: 0.7500 - loss: 0.6653
Epoch 1227/2000
1/1 0s 66ms/step -
accuracy: 0.7500 - loss: 0.6653
Epoch 1228/2000
1/1 0s 85ms/step -
accuracy: 0.7500 - loss: 0.6652
Epoch 1229/2000
1/1 0s 99ms/step -

accuracy: 0.7500 - loss: 0.6651
Epoch 1230/2000
1/1 0s 89ms/step -
accuracy: 0.7500 - loss: 0.6650
Epoch 1231/2000
1/1 0s 143ms/step -
accuracy: 0.7500 - loss: 0.6649
Epoch 1232/2000
1/1 0s 73ms/step -
accuracy: 0.7500 - loss: 0.6648
Epoch 1233/2000
1/1 0s 81ms/step -
accuracy: 0.7500 - loss: 0.6647
Epoch 1234/2000
1/1 0s 100ms/step -
accuracy: 0.7500 - loss: 0.6647
Epoch 1235/2000
1/1 0s 111ms/step -
accuracy: 0.7500 - loss: 0.6646
Epoch 1236/2000
1/1 0s 128ms/step -
accuracy: 0.7500 - loss: 0.6645
Epoch 1237/2000
1/1 0s 122ms/step -
accuracy: 0.7500 - loss: 0.6644
Epoch 1238/2000
1/1 0s 174ms/step -
accuracy: 0.7500 - loss: 0.6643
Epoch 1239/2000
1/1 0s 119ms/step -
accuracy: 0.7500 - loss: 0.6642
Epoch 1240/2000
1/1 0s 118ms/step -
accuracy: 0.7500 - loss: 0.6641
Epoch 1241/2000
1/1 0s 91ms/step -
accuracy: 0.7500 - loss: 0.6640
Epoch 1242/2000
1/1 0s 192ms/step -
accuracy: 0.7500 - loss: 0.6640
Epoch 1243/2000
1/1 0s 82ms/step -
accuracy: 0.7500 - loss: 0.6639
Epoch 1244/2000
1/1 0s 79ms/step -
accuracy: 0.7500 - loss: 0.6638
Epoch 1245/2000
1/1 0s 88ms/step -

accuracy: 0.7500 - loss: 0.6637
Epoch 1246/2000
1/1 0s 76ms/step -
accuracy: 0.7500 - loss: 0.6636
Epoch 1247/2000
1/1 0s 87ms/step -
accuracy: 0.7500 - loss: 0.6635
Epoch 1248/2000
1/1 0s 82ms/step -
accuracy: 0.7500 - loss: 0.6634
Epoch 1249/2000
1/1 0s 79ms/step -
accuracy: 0.7500 - loss: 0.6633
Epoch 1250/2000
1/1 0s 74ms/step -
accuracy: 0.7500 - loss: 0.6632
Epoch 1251/2000
1/1 0s 89ms/step -
accuracy: 0.7500 - loss: 0.6631
Epoch 1252/2000
1/1 0s 92ms/step -
accuracy: 0.7500 - loss: 0.6630
Epoch 1253/2000
1/1 0s 87ms/step -
accuracy: 0.7500 - loss: 0.6630
Epoch 1254/2000
1/1 0s 76ms/step -
accuracy: 0.7500 - loss: 0.6629
Epoch 1255/2000
1/1 0s 127ms/step -
accuracy: 0.7500 - loss: 0.6628
Epoch 1256/2000
1/1 0s 84ms/step -
accuracy: 0.7500 - loss: 0.6627
Epoch 1257/2000
1/1 0s 138ms/step -
accuracy: 0.7500 - loss: 0.6626
Epoch 1258/2000
1/1 0s 110ms/step -
accuracy: 0.7500 - loss: 0.6625
Epoch 1259/2000
1/1 0s 191ms/step -
accuracy: 0.7500 - loss: 0.6624
Epoch 1260/2000
1/1 0s 110ms/step -
accuracy: 0.7500 - loss: 0.6623
Epoch 1261/2000
1/1 0s 117ms/step -

accuracy: 0.7500 - loss: 0.6622
Epoch 1262/2000
1/1 0s 102ms/step -
accuracy: 0.7500 - loss: 0.6621
Epoch 1263/2000
1/1 0s 91ms/step -
accuracy: 0.7500 - loss: 0.6620
Epoch 1264/2000
1/1 0s 100ms/step -
accuracy: 0.7500 - loss: 0.6619
Epoch 1265/2000
1/1 0s 149ms/step -
accuracy: 0.7500 - loss: 0.6618
Epoch 1266/2000
1/1 0s 91ms/step -
accuracy: 0.7500 - loss: 0.6617
Epoch 1267/2000
1/1 0s 83ms/step -
accuracy: 0.7500 - loss: 0.6616
Epoch 1268/2000
1/1 0s 66ms/step -
accuracy: 0.7500 - loss: 0.6615
Epoch 1269/2000
1/1 0s 68ms/step -
accuracy: 0.7500 - loss: 0.6614
Epoch 1270/2000
1/1 0s 79ms/step -
accuracy: 0.7500 - loss: 0.6614
Epoch 1271/2000
1/1 0s 66ms/step -
accuracy: 0.7500 - loss: 0.6613
Epoch 1272/2000
1/1 0s 74ms/step -
accuracy: 0.7500 - loss: 0.6612
Epoch 1273/2000
1/1 0s 116ms/step -
accuracy: 0.7500 - loss: 0.6611
Epoch 1274/2000
1/1 0s 72ms/step -
accuracy: 0.7500 - loss: 0.6610
Epoch 1275/2000
1/1 0s 71ms/step -
accuracy: 0.7500 - loss: 0.6609
Epoch 1276/2000
1/1 0s 67ms/step -
accuracy: 0.7500 - loss: 0.6608
Epoch 1277/2000
1/1 0s 78ms/step -

accuracy: 0.7500 - loss: 0.6607
Epoch 1278/2000
1/1 0s 87ms/step -
accuracy: 0.7500 - loss: 0.6606
Epoch 1279/2000
1/1 0s 83ms/step -
accuracy: 0.7500 - loss: 0.6605
Epoch 1280/2000
1/1 0s 72ms/step -
accuracy: 0.7500 - loss: 0.6604
Epoch 1281/2000
1/1 0s 87ms/step -
accuracy: 0.7500 - loss: 0.6603
Epoch 1282/2000
1/1 0s 75ms/step -
accuracy: 0.7500 - loss: 0.6602
Epoch 1283/2000
1/1 0s 73ms/step -
accuracy: 0.7500 - loss: 0.6601
Epoch 1284/2000
1/1 0s 69ms/step -
accuracy: 0.7500 - loss: 0.6600
Epoch 1285/2000
1/1 0s 59ms/step -
accuracy: 0.7500 - loss: 0.6599
Epoch 1286/2000
1/1 0s 118ms/step -
accuracy: 0.7500 - loss: 0.6598
Epoch 1287/2000
1/1 0s 71ms/step -
accuracy: 0.7500 - loss: 0.6597
Epoch 1288/2000
1/1 0s 94ms/step -
accuracy: 0.7500 - loss: 0.6596
Epoch 1289/2000
1/1 0s 78ms/step -
accuracy: 0.7500 - loss: 0.6595
Epoch 1290/2000
1/1 0s 68ms/step -
accuracy: 0.7500 - loss: 0.6594
Epoch 1291/2000
1/1 0s 79ms/step -
accuracy: 0.7500 - loss: 0.6593
Epoch 1292/2000
1/1 0s 160ms/step -
accuracy: 0.7500 - loss: 0.6592
Epoch 1293/2000
1/1 0s 75ms/step -

accuracy: 0.7500 - loss: 0.6591
Epoch 1294/2000
1/1 0s 72ms/step -
accuracy: 0.7500 - loss: 0.6589
Epoch 1295/2000
1/1 0s 82ms/step -
accuracy: 0.7500 - loss: 0.6588
Epoch 1296/2000
1/1 0s 74ms/step -
accuracy: 0.7500 - loss: 0.6587
Epoch 1297/2000
1/1 0s 112ms/step -
accuracy: 0.7500 - loss: 0.6586
Epoch 1298/2000
1/1 0s 58ms/step -
accuracy: 0.7500 - loss: 0.6585
Epoch 1299/2000
1/1 0s 65ms/step -
accuracy: 0.7500 - loss: 0.6584
Epoch 1300/2000
1/1 0s 68ms/step -
accuracy: 0.7500 - loss: 0.6583
Epoch 1301/2000
1/1 0s 69ms/step -
accuracy: 0.7500 - loss: 0.6582
Epoch 1302/2000
1/1 0s 60ms/step -
accuracy: 0.7500 - loss: 0.6581
Epoch 1303/2000
1/1 0s 61ms/step -
accuracy: 0.7500 - loss: 0.6580
Epoch 1304/2000
1/1 0s 59ms/step -
accuracy: 0.7500 - loss: 0.6579
Epoch 1305/2000
1/1 0s 71ms/step -
accuracy: 0.7500 - loss: 0.6578
Epoch 1306/2000
1/1 0s 77ms/step -
accuracy: 0.7500 - loss: 0.6577
Epoch 1307/2000
1/1 0s 75ms/step -
accuracy: 0.7500 - loss: 0.6576
Epoch 1308/2000
1/1 0s 66ms/step -
accuracy: 0.7500 - loss: 0.6575
Epoch 1309/2000
1/1 0s 67ms/step -

accuracy: 0.7500 - loss: 0.6574
Epoch 1310/2000
1/1 0s 70ms/step -
accuracy: 0.7500 - loss: 0.6573
Epoch 1311/2000
1/1 0s 91ms/step -
accuracy: 0.7500 - loss: 0.6571
Epoch 1312/2000
1/1 0s 83ms/step -
accuracy: 0.7500 - loss: 0.6570
Epoch 1313/2000
1/1 0s 77ms/step -
accuracy: 0.7500 - loss: 0.6569
Epoch 1314/2000
1/1 0s 84ms/step -
accuracy: 0.7500 - loss: 0.6568
Epoch 1315/2000
1/1 0s 141ms/step -
accuracy: 0.7500 - loss: 0.6567
Epoch 1316/2000
1/1 0s 63ms/step -
accuracy: 0.7500 - loss: 0.6566
Epoch 1317/2000
1/1 0s 64ms/step -
accuracy: 0.7500 - loss: 0.6565
Epoch 1318/2000
1/1 0s 158ms/step -
accuracy: 0.7500 - loss: 0.6564
Epoch 1319/2000
1/1 0s 76ms/step -
accuracy: 0.7500 - loss: 0.6563
Epoch 1320/2000
1/1 0s 81ms/step -
accuracy: 0.7500 - loss: 0.6562
Epoch 1321/2000
1/1 0s 66ms/step -
accuracy: 0.7500 - loss: 0.6560
Epoch 1322/2000
1/1 0s 58ms/step -
accuracy: 0.7500 - loss: 0.6559
Epoch 1323/2000
1/1 0s 76ms/step -
accuracy: 0.7500 - loss: 0.6558
Epoch 1324/2000
1/1 0s 77ms/step -
accuracy: 0.7500 - loss: 0.6557
Epoch 1325/2000
1/1 0s 66ms/step -

accuracy: 0.7500 - loss: 0.6556
Epoch 1326/2000
1/1 0s 68ms/step -
accuracy: 0.7500 - loss: 0.6555
Epoch 1327/2000
1/1 0s 74ms/step -
accuracy: 0.7500 - loss: 0.6554
Epoch 1328/2000
1/1 0s 67ms/step -
accuracy: 0.7500 - loss: 0.6553
Epoch 1329/2000
1/1 0s 68ms/step -
accuracy: 0.7500 - loss: 0.6551
Epoch 1330/2000
1/1 0s 70ms/step -
accuracy: 0.7500 - loss: 0.6550
Epoch 1331/2000
1/1 0s 59ms/step -
accuracy: 0.7500 - loss: 0.6549
Epoch 1332/2000
1/1 0s 61ms/step -
accuracy: 0.7500 - loss: 0.6548
Epoch 1333/2000
1/1 0s 94ms/step -
accuracy: 0.7500 - loss: 0.6547
Epoch 1334/2000
1/1 0s 91ms/step -
accuracy: 0.7500 - loss: 0.6546
Epoch 1335/2000
1/1 0s 89ms/step -
accuracy: 0.7500 - loss: 0.6544
Epoch 1336/2000
1/1 0s 87ms/step -
accuracy: 0.7500 - loss: 0.6543
Epoch 1337/2000
1/1 0s 103ms/step -
accuracy: 0.7500 - loss: 0.6542
Epoch 1338/2000
1/1 0s 145ms/step -
accuracy: 0.7500 - loss: 0.6541
Epoch 1339/2000
1/1 0s 167ms/step -
accuracy: 0.7500 - loss: 0.6540
Epoch 1340/2000
1/1 0s 85ms/step -
accuracy: 0.7500 - loss: 0.6539
Epoch 1341/2000
1/1 0s 81ms/step -

```

accuracy: 0.7500 - loss: 0.6537
Epoch 1342/2000
1/1          0s 73ms/step -
accuracy: 0.7500 - loss: 0.6536
Epoch 1343/2000
1/1          0s 68ms/step -
accuracy: 0.7500 - loss: 0.6535
Epoch 1344/2000
1/1          0s 65ms/step -
accuracy: 0.7500 - loss: 0.6534
Epoch 1345/2000
1/1          0s 73ms/step -
accuracy: 0.7500 - loss: 0.6533
Epoch 1346/2000
1/1          0s 75ms/step -
accuracy: 0.7500 - loss: 0.6531
Epoch 1347/2000
1/1          0s 67ms/step -
accuracy: 0.7500 - loss: 0.6530
Epoch 1348/2000
1/1          0s 69ms/step -
accuracy: 0.7500 - loss: 0.6529
Epoch 1349/2000
1/1          0s 97ms/step -
accuracy: 0.7500 - loss: 0.6528
Epoch 1350/2000
1/1          0s 88ms/step -
accuracy: 0.7500 - loss: 0.6527
Epoch 1351/2000
1/1          0s 76ms/step -
accuracy: 0.7500 - loss: 0.6525
Epoch 1352/2000
1/1          0s 90ms/step -
accuracy: 0.7500 - loss: 0.6524
Epoch 1353/2000
1/1          0s 92ms/step -
accuracy: 0.7500 - loss: 0.6523
Epoch 1354/2000
1/1          0s 167ms/step -
accuracy: 0.7500 - loss: 0.6522
Epoch 1355/2000
1/1          0s 134ms/step -
accuracy: 0.7500 - loss: 0.6521
Epoch 1356/2000
1/1          0s 93ms/step -
accuracy: 0.7500 - loss: 0.6519
Epoch 1357/2000
1/1          0s 93ms/step -

```

accuracy: 0.7500 - loss: 0.6518
Epoch 1358/2000
1/1 0s 88ms/step -
accuracy: 0.7500 - loss: 0.6517
Epoch 1359/2000
1/1 0s 146ms/step -
accuracy: 0.7500 - loss: 0.6516
Epoch 1360/2000
1/1 0s 82ms/step -
accuracy: 0.7500 - loss: 0.6514
Epoch 1361/2000
1/1 0s 82ms/step -
accuracy: 0.7500 - loss: 0.6513
Epoch 1362/2000
1/1 0s 78ms/step -
accuracy: 0.7500 - loss: 0.6512
Epoch 1363/2000
1/1 0s 63ms/step -
accuracy: 0.7500 - loss: 0.6511
Epoch 1364/2000
1/1 0s 73ms/step -
accuracy: 0.7500 - loss: 0.6509
Epoch 1365/2000
1/1 0s 81ms/step -
accuracy: 0.7500 - loss: 0.6508
Epoch 1366/2000
1/1 0s 75ms/step -
accuracy: 0.7500 - loss: 0.6507
Epoch 1367/2000
1/1 0s 94ms/step -
accuracy: 0.7500 - loss: 0.6506
Epoch 1368/2000
1/1 0s 81ms/step -
accuracy: 0.7500 - loss: 0.6504
Epoch 1369/2000
1/1 0s 180ms/step -
accuracy: 0.7500 - loss: 0.6503
Epoch 1370/2000
1/1 0s 108ms/step -
accuracy: 0.7500 - loss: 0.6502
Epoch 1371/2000
1/1 0s 92ms/step -
accuracy: 0.7500 - loss: 0.6500
Epoch 1372/2000
1/1 0s 81ms/step -
accuracy: 0.7500 - loss: 0.6499
Epoch 1373/2000
1/1 0s 74ms/step -

accuracy: 0.7500 - loss: 0.6498
Epoch 1374/2000
1/1 0s 71ms/step -
accuracy: 0.7500 - loss: 0.6497
Epoch 1375/2000
1/1 0s 68ms/step -
accuracy: 0.7500 - loss: 0.6495
Epoch 1376/2000
1/1 0s 202ms/step -
accuracy: 0.7500 - loss: 0.6494
Epoch 1377/2000
1/1 0s 86ms/step -
accuracy: 0.7500 - loss: 0.6493
Epoch 1378/2000
1/1 0s 90ms/step -
accuracy: 0.7500 - loss: 0.6491
Epoch 1379/2000
1/1 0s 107ms/step -
accuracy: 0.7500 - loss: 0.6490
Epoch 1380/2000
1/1 0s 79ms/step -
accuracy: 0.7500 - loss: 0.6489
Epoch 1381/2000
1/1 0s 82ms/step -
accuracy: 0.7500 - loss: 0.6487
Epoch 1382/2000
1/1 0s 82ms/step -
accuracy: 0.7500 - loss: 0.6486
Epoch 1383/2000
1/1 0s 84ms/step -
accuracy: 0.7500 - loss: 0.6485
Epoch 1384/2000
1/1 0s 75ms/step -
accuracy: 0.7500 - loss: 0.6483
Epoch 1385/2000
1/1 0s 71ms/step -
accuracy: 0.7500 - loss: 0.6482
Epoch 1386/2000
1/1 0s 79ms/step -
accuracy: 0.7500 - loss: 0.6481
Epoch 1387/2000
1/1 0s 71ms/step -
accuracy: 0.7500 - loss: 0.6479
Epoch 1388/2000
1/1 0s 144ms/step -
accuracy: 0.7500 - loss: 0.6478
Epoch 1389/2000
1/1 0s 63ms/step -

accuracy: 0.7500 - loss: 0.6477
Epoch 1390/2000
1/1 0s 85ms/step -
accuracy: 0.7500 - loss: 0.6475
Epoch 1391/2000
1/1 0s 82ms/step -
accuracy: 0.7500 - loss: 0.6474
Epoch 1392/2000
1/1 0s 78ms/step -
accuracy: 0.7500 - loss: 0.6473
Epoch 1393/2000
1/1 0s 77ms/step -
accuracy: 0.7500 - loss: 0.6471
Epoch 1394/2000
1/1 0s 81ms/step -
accuracy: 0.7500 - loss: 0.6470
Epoch 1395/2000
1/1 0s 74ms/step -
accuracy: 0.7500 - loss: 0.6469
Epoch 1396/2000
1/1 0s 78ms/step -
accuracy: 0.7500 - loss: 0.6467
Epoch 1397/2000
1/1 0s 110ms/step -
accuracy: 0.7500 - loss: 0.6466
Epoch 1398/2000
1/1 0s 202ms/step -
accuracy: 0.7500 - loss: 0.6465
Epoch 1399/2000
1/1 0s 172ms/step -
accuracy: 0.7500 - loss: 0.6463
Epoch 1400/2000
1/1 0s 104ms/step -
accuracy: 0.7500 - loss: 0.6462
Epoch 1401/2000
1/1 0s 111ms/step -
accuracy: 0.7500 - loss: 0.6460
Epoch 1402/2000
1/1 0s 97ms/step -
accuracy: 0.7500 - loss: 0.6459
Epoch 1403/2000
1/1 0s 127ms/step -
accuracy: 0.7500 - loss: 0.6458
Epoch 1404/2000
1/1 0s 117ms/step -
accuracy: 0.7500 - loss: 0.6456
Epoch 1405/2000
1/1 0s 108ms/step -

```

accuracy: 0.7500 - loss: 0.6455
Epoch 1406/2000
1/1          0s 171ms/step -
accuracy: 0.7500 - loss: 0.6453
Epoch 1407/2000
1/1          0s 105ms/step -
accuracy: 0.7500 - loss: 0.6452
Epoch 1408/2000
1/1          0s 100ms/step -
accuracy: 0.7500 - loss: 0.6451
Epoch 1409/2000
1/1          0s 79ms/step -
accuracy: 0.7500 - loss: 0.6449
Epoch 1410/2000
1/1          0s 73ms/step -
accuracy: 0.7500 - loss: 0.6448
Epoch 1411/2000
1/1          0s 74ms/step -
accuracy: 0.7500 - loss: 0.6446
Epoch 1412/2000
1/1          0s 67ms/step -
accuracy: 0.7500 - loss: 0.6445
Epoch 1413/2000
1/1          0s 77ms/step -
accuracy: 0.7500 - loss: 0.6443
Epoch 1414/2000
1/1          0s 151ms/step -
accuracy: 0.7500 - loss: 0.6442
Epoch 1415/2000
1/1          0s 84ms/step -
accuracy: 0.7500 - loss: 0.6440
Epoch 1416/2000
1/1          0s 89ms/step -
accuracy: 0.7500 - loss: 0.6439
Epoch 1417/2000
1/1          0s 153ms/step -
accuracy: 0.7500 - loss: 0.6438
Epoch 1418/2000
1/1          0s 68ms/step -
accuracy: 0.7500 - loss: 0.6436
Epoch 1419/2000
1/1          0s 87ms/step -
accuracy: 0.7500 - loss: 0.6435
Epoch 1420/2000
1/1          0s 74ms/step -
accuracy: 0.7500 - loss: 0.6433
Epoch 1421/2000
1/1          0s 73ms/step -

```

accuracy: 0.7500 - loss: 0.6432
Epoch 1422/2000
1/1 0s 162ms/step -
accuracy: 0.7500 - loss: 0.6430
Epoch 1423/2000
1/1 0s 98ms/step -
accuracy: 0.7500 - loss: 0.6429
Epoch 1424/2000
1/1 0s 101ms/step -
accuracy: 0.7500 - loss: 0.6427
Epoch 1425/2000
1/1 0s 95ms/step -
accuracy: 0.7500 - loss: 0.6426
Epoch 1426/2000
1/1 0s 93ms/step -
accuracy: 0.7500 - loss: 0.6424
Epoch 1427/2000
1/1 0s 109ms/step -
accuracy: 0.7500 - loss: 0.6423
Epoch 1428/2000
1/1 0s 124ms/step -
accuracy: 0.7500 - loss: 0.6421
Epoch 1429/2000
1/1 0s 120ms/step -
accuracy: 0.7500 - loss: 0.6420
Epoch 1430/2000
1/1 0s 94ms/step -
accuracy: 0.7500 - loss: 0.6418
Epoch 1431/2000
1/1 0s 98ms/step -
accuracy: 0.7500 - loss: 0.6417
Epoch 1432/2000
1/1 0s 200ms/step -
accuracy: 0.7500 - loss: 0.6415
Epoch 1433/2000
1/1 0s 94ms/step -
accuracy: 0.7500 - loss: 0.6414
Epoch 1434/2000
1/1 0s 88ms/step -
accuracy: 0.7500 - loss: 0.6412
Epoch 1435/2000
1/1 0s 117ms/step -
accuracy: 0.7500 - loss: 0.6411
Epoch 1436/2000
1/1 0s 96ms/step -
accuracy: 0.7500 - loss: 0.6409
Epoch 1437/2000
1/1 0s 106ms/step -

accuracy: 0.7500 - loss: 0.6408
Epoch 1438/2000
1/1 0s 104ms/step -
accuracy: 0.7500 - loss: 0.6406
Epoch 1439/2000
1/1 0s 202ms/step -
accuracy: 0.7500 - loss: 0.6405
Epoch 1440/2000
1/1 0s 92ms/step -
accuracy: 0.7500 - loss: 0.6403
Epoch 1441/2000
1/1 0s 87ms/step -
accuracy: 0.7500 - loss: 0.6402
Epoch 1442/2000
1/1 0s 79ms/step -
accuracy: 0.7500 - loss: 0.6400
Epoch 1443/2000
1/1 0s 91ms/step -
accuracy: 0.7500 - loss: 0.6398
Epoch 1444/2000
1/1 0s 76ms/step -
accuracy: 0.7500 - loss: 0.6397
Epoch 1445/2000
1/1 0s 81ms/step -
accuracy: 0.7500 - loss: 0.6395
Epoch 1446/2000
1/1 0s 88ms/step -
accuracy: 0.7500 - loss: 0.6394
Epoch 1447/2000
1/1 0s 96ms/step -
accuracy: 0.7500 - loss: 0.6392
Epoch 1448/2000
1/1 0s 168ms/step -
accuracy: 0.7500 - loss: 0.6391
Epoch 1449/2000
1/1 0s 148ms/step -
accuracy: 0.7500 - loss: 0.6389
Epoch 1450/2000
1/1 0s 115ms/step -
accuracy: 0.7500 - loss: 0.6387
Epoch 1451/2000
1/1 0s 82ms/step -
accuracy: 0.7500 - loss: 0.6386
Epoch 1452/2000
1/1 0s 92ms/step -
accuracy: 0.7500 - loss: 0.6384
Epoch 1453/2000
1/1 0s 107ms/step -

accuracy: 0.7500 - loss: 0.6383
Epoch 1454/2000
1/1 0s 98ms/step -
accuracy: 0.7500 - loss: 0.6381
Epoch 1455/2000
1/1 0s 111ms/step -
accuracy: 0.7500 - loss: 0.6379
Epoch 1456/2000
1/1 0s 128ms/step -
accuracy: 0.7500 - loss: 0.6378
Epoch 1457/2000
1/1 0s 130ms/step -
accuracy: 0.7500 - loss: 0.6376
Epoch 1458/2000
1/1 0s 81ms/step -
accuracy: 0.7500 - loss: 0.6375
Epoch 1459/2000
1/1 0s 88ms/step -
accuracy: 0.7500 - loss: 0.6373
Epoch 1460/2000
1/1 0s 132ms/step -
accuracy: 0.7500 - loss: 0.6371
Epoch 1461/2000
1/1 0s 97ms/step -
accuracy: 0.7500 - loss: 0.6370
Epoch 1462/2000
1/1 0s 243ms/step -
accuracy: 0.7500 - loss: 0.6368
Epoch 1463/2000
1/1 0s 208ms/step -
accuracy: 0.7500 - loss: 0.6366
Epoch 1464/2000
1/1 0s 406ms/step -
accuracy: 0.7500 - loss: 0.6365
Epoch 1465/2000
1/1 0s 114ms/step -
accuracy: 0.7500 - loss: 0.6363
Epoch 1466/2000
1/1 0s 211ms/step -
accuracy: 0.7500 - loss: 0.6362
Epoch 1467/2000
1/1 0s 222ms/step -
accuracy: 0.7500 - loss: 0.6360
Epoch 1468/2000
1/1 0s 164ms/step -
accuracy: 0.7500 - loss: 0.6358
Epoch 1469/2000
1/1 0s 143ms/step -

accuracy: 0.7500 - loss: 0.6357
Epoch 1470/2000
1/1 0s 99ms/step -
accuracy: 0.7500 - loss: 0.6355
Epoch 1471/2000
1/1 0s 159ms/step -
accuracy: 0.7500 - loss: 0.6353
Epoch 1472/2000
1/1 0s 107ms/step -
accuracy: 0.7500 - loss: 0.6352
Epoch 1473/2000
1/1 0s 88ms/step -
accuracy: 0.7500 - loss: 0.6350
Epoch 1474/2000
1/1 0s 93ms/step -
accuracy: 0.7500 - loss: 0.6348
Epoch 1475/2000
1/1 0s 103ms/step -
accuracy: 0.7500 - loss: 0.6346
Epoch 1476/2000
1/1 0s 93ms/step -
accuracy: 0.7500 - loss: 0.6345
Epoch 1477/2000
1/1 0s 177ms/step -
accuracy: 0.7500 - loss: 0.6343
Epoch 1478/2000
1/1 0s 123ms/step -
accuracy: 0.7500 - loss: 0.6341
Epoch 1479/2000
1/1 0s 108ms/step -
accuracy: 0.7500 - loss: 0.6340
Epoch 1480/2000
1/1 0s 101ms/step -
accuracy: 1.0000 - loss: 0.6338
Epoch 1481/2000
1/1 0s 83ms/step -
accuracy: 1.0000 - loss: 0.6336
Epoch 1482/2000
1/1 0s 125ms/step -
accuracy: 1.0000 - loss: 0.6335
Epoch 1483/2000
1/1 0s 148ms/step -
accuracy: 1.0000 - loss: 0.6333
Epoch 1484/2000
1/1 0s 83ms/step -
accuracy: 1.0000 - loss: 0.6331
Epoch 1485/2000
1/1 0s 73ms/step -

accuracy: 1.0000 - loss: 0.6329
Epoch 1486/2000
1/1 0s 82ms/step -
accuracy: 1.0000 - loss: 0.6328
Epoch 1487/2000
1/1 0s 73ms/step -
accuracy: 1.0000 - loss: 0.6326
Epoch 1488/2000
1/1 0s 82ms/step -
accuracy: 1.0000 - loss: 0.6324
Epoch 1489/2000
1/1 0s 162ms/step -
accuracy: 1.0000 - loss: 0.6322
Epoch 1490/2000
1/1 0s 78ms/step -
accuracy: 1.0000 - loss: 0.6321
Epoch 1491/2000
1/1 0s 74ms/step -
accuracy: 1.0000 - loss: 0.6319
Epoch 1492/2000
1/1 0s 128ms/step -
accuracy: 1.0000 - loss: 0.6317
Epoch 1493/2000
1/1 0s 75ms/step -
accuracy: 1.0000 - loss: 0.6315
Epoch 1494/2000
1/1 0s 70ms/step -
accuracy: 1.0000 - loss: 0.6314
Epoch 1495/2000
1/1 0s 82ms/step -
accuracy: 1.0000 - loss: 0.6312
Epoch 1496/2000
1/1 0s 75ms/step -
accuracy: 1.0000 - loss: 0.6310
Epoch 1497/2000
1/1 0s 67ms/step -
accuracy: 1.0000 - loss: 0.6308
Epoch 1498/2000
1/1 0s 75ms/step -
accuracy: 1.0000 - loss: 0.6306
Epoch 1499/2000
1/1 0s 82ms/step -
accuracy: 1.0000 - loss: 0.6305
Epoch 1500/2000
1/1 0s 128ms/step -
accuracy: 1.0000 - loss: 0.6303
Epoch 1501/2000
1/1 0s 83ms/step -

accuracy: 1.0000 - loss: 0.6301
Epoch 1502/2000
1/1 0s 78ms/step -
accuracy: 1.0000 - loss: 0.6299
Epoch 1503/2000
1/1 0s 65ms/step -
accuracy: 1.0000 - loss: 0.6297
Epoch 1504/2000
1/1 0s 74ms/step -
accuracy: 1.0000 - loss: 0.6296
Epoch 1505/2000
1/1 0s 72ms/step -
accuracy: 1.0000 - loss: 0.6294
Epoch 1506/2000
1/1 0s 75ms/step -
accuracy: 1.0000 - loss: 0.6292
Epoch 1507/2000
1/1 0s 73ms/step -
accuracy: 1.0000 - loss: 0.6290
Epoch 1508/2000
1/1 0s 68ms/step -
accuracy: 1.0000 - loss: 0.6288
Epoch 1509/2000
1/1 0s 74ms/step -
accuracy: 1.0000 - loss: 0.6286
Epoch 1510/2000
1/1 0s 68ms/step -
accuracy: 1.0000 - loss: 0.6284
Epoch 1511/2000
1/1 0s 88ms/step -
accuracy: 1.0000 - loss: 0.6283
Epoch 1512/2000
1/1 0s 89ms/step -
accuracy: 1.0000 - loss: 0.6281
Epoch 1513/2000
1/1 0s 137ms/step -
accuracy: 1.0000 - loss: 0.6279
Epoch 1514/2000
1/1 0s 73ms/step -
accuracy: 1.0000 - loss: 0.6277
Epoch 1515/2000
1/1 0s 74ms/step -
accuracy: 1.0000 - loss: 0.6275
Epoch 1516/2000
1/1 0s 75ms/step -
accuracy: 1.0000 - loss: 0.6273
Epoch 1517/2000
1/1 0s 85ms/step -

accuracy: 1.0000 - loss: 0.6271
Epoch 1518/2000
1/1 0s 73ms/step -
accuracy: 1.0000 - loss: 0.6270
Epoch 1519/2000
1/1 0s 77ms/step -
accuracy: 1.0000 - loss: 0.6268
Epoch 1520/2000
1/1 0s 74ms/step -
accuracy: 1.0000 - loss: 0.6266
Epoch 1521/2000
1/1 0s 133ms/step -
accuracy: 1.0000 - loss: 0.6264
Epoch 1522/2000
1/1 0s 80ms/step -
accuracy: 1.0000 - loss: 0.6262
Epoch 1523/2000
1/1 0s 76ms/step -
accuracy: 1.0000 - loss: 0.6260
Epoch 1524/2000
1/1 0s 72ms/step -
accuracy: 1.0000 - loss: 0.6258
Epoch 1525/2000
1/1 0s 70ms/step -
accuracy: 1.0000 - loss: 0.6256
Epoch 1526/2000
1/1 0s 72ms/step -
accuracy: 1.0000 - loss: 0.6254
Epoch 1527/2000
1/1 0s 69ms/step -
accuracy: 1.0000 - loss: 0.6252
Epoch 1528/2000
1/1 0s 87ms/step -
accuracy: 1.0000 - loss: 0.6250
Epoch 1529/2000
1/1 0s 78ms/step -
accuracy: 1.0000 - loss: 0.6248
Epoch 1530/2000
1/1 0s 113ms/step -
accuracy: 1.0000 - loss: 0.6247
Epoch 1531/2000
1/1 0s 67ms/step -
accuracy: 1.0000 - loss: 0.6245
Epoch 1532/2000
1/1 0s 69ms/step -
accuracy: 1.0000 - loss: 0.6243
Epoch 1533/2000
1/1 0s 66ms/step -

accuracy: 1.0000 - loss: 0.6241
Epoch 1534/2000
1/1 0s 88ms/step -
accuracy: 1.0000 - loss: 0.6239
Epoch 1535/2000
1/1 0s 72ms/step -
accuracy: 1.0000 - loss: 0.6237
Epoch 1536/2000
1/1 0s 67ms/step -
accuracy: 1.0000 - loss: 0.6235
Epoch 1537/2000
1/1 0s 68ms/step -
accuracy: 1.0000 - loss: 0.6233
Epoch 1538/2000
1/1 0s 69ms/step -
accuracy: 1.0000 - loss: 0.6231
Epoch 1539/2000
1/1 0s 136ms/step -
accuracy: 1.0000 - loss: 0.6229
Epoch 1540/2000
1/1 0s 63ms/step -
accuracy: 1.0000 - loss: 0.6227
Epoch 1541/2000
1/1 0s 68ms/step -
accuracy: 1.0000 - loss: 0.6225
Epoch 1542/2000
1/1 0s 56ms/step -
accuracy: 1.0000 - loss: 0.6223
Epoch 1543/2000
1/1 0s 64ms/step -
accuracy: 1.0000 - loss: 0.6221
Epoch 1544/2000
1/1 0s 62ms/step -
accuracy: 1.0000 - loss: 0.6219
Epoch 1545/2000
1/1 0s 66ms/step -
accuracy: 1.0000 - loss: 0.6217
Epoch 1546/2000
1/1 0s 69ms/step -
accuracy: 1.0000 - loss: 0.6215
Epoch 1547/2000
1/1 0s 59ms/step -
accuracy: 1.0000 - loss: 0.6213
Epoch 1548/2000
1/1 0s 61ms/step -
accuracy: 1.0000 - loss: 0.6211
Epoch 1549/2000
1/1 0s 64ms/step -

accuracy: 1.0000 - loss: 0.6209
Epoch 1550/2000
1/1 0s 75ms/step -
accuracy: 1.0000 - loss: 0.6207
Epoch 1551/2000
1/1 0s 61ms/step -
accuracy: 1.0000 - loss: 0.6204
Epoch 1552/2000
1/1 0s 62ms/step -
accuracy: 1.0000 - loss: 0.6202
Epoch 1553/2000
1/1 0s 148ms/step -
accuracy: 1.0000 - loss: 0.6200
Epoch 1554/2000
1/1 0s 61ms/step -
accuracy: 1.0000 - loss: 0.6198
Epoch 1555/2000
1/1 0s 69ms/step -
accuracy: 1.0000 - loss: 0.6196
Epoch 1556/2000
1/1 0s 68ms/step -
accuracy: 1.0000 - loss: 0.6194
Epoch 1557/2000
1/1 0s 69ms/step -
accuracy: 1.0000 - loss: 0.6192
Epoch 1558/2000
1/1 0s 56ms/step -
accuracy: 1.0000 - loss: 0.6190
Epoch 1559/2000
1/1 0s 61ms/step -
accuracy: 1.0000 - loss: 0.6188
Epoch 1560/2000
1/1 0s 63ms/step -
accuracy: 1.0000 - loss: 0.6186
Epoch 1561/2000
1/1 0s 69ms/step -
accuracy: 1.0000 - loss: 0.6184
Epoch 1562/2000
1/1 0s 97ms/step -
accuracy: 1.0000 - loss: 0.6182
Epoch 1563/2000
1/1 0s 66ms/step -
accuracy: 1.0000 - loss: 0.6179
Epoch 1564/2000
1/1 0s 63ms/step -
accuracy: 1.0000 - loss: 0.6177
Epoch 1565/2000
1/1 0s 68ms/step -

accuracy: 1.0000 - loss: 0.6175
Epoch 1566/2000
1/1 0s 58ms/step -
accuracy: 1.0000 - loss: 0.6173
Epoch 1567/2000
1/1 0s 58ms/step -
accuracy: 1.0000 - loss: 0.6171
Epoch 1568/2000
1/1 0s 52ms/step -
accuracy: 1.0000 - loss: 0.6169
Epoch 1569/2000
1/1 0s 68ms/step -
accuracy: 1.0000 - loss: 0.6167
Epoch 1570/2000
1/1 0s 58ms/step -
accuracy: 1.0000 - loss: 0.6165
Epoch 1571/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.6162
Epoch 1572/2000
1/1 0s 64ms/step -
accuracy: 1.0000 - loss: 0.6160
Epoch 1573/2000
1/1 0s 54ms/step -
accuracy: 1.0000 - loss: 0.6158
Epoch 1574/2000
1/1 0s 55ms/step -
accuracy: 1.0000 - loss: 0.6156
Epoch 1575/2000
1/1 0s 53ms/step -
accuracy: 1.0000 - loss: 0.6154
Epoch 1576/2000
1/1 0s 54ms/step -
accuracy: 1.0000 - loss: 0.6152
Epoch 1577/2000
1/1 0s 70ms/step -
accuracy: 1.0000 - loss: 0.6149
Epoch 1578/2000
1/1 0s 66ms/step -
accuracy: 1.0000 - loss: 0.6147
Epoch 1579/2000
1/1 0s 71ms/step -
accuracy: 1.0000 - loss: 0.6145
Epoch 1580/2000
1/1 0s 154ms/step -
accuracy: 1.0000 - loss: 0.6143
Epoch 1581/2000
1/1 0s 58ms/step -

accuracy: 1.0000 - loss: 0.6141
Epoch 1582/2000
1/1 0s 64ms/step -
accuracy: 1.0000 - loss: 0.6138
Epoch 1583/2000
1/1 0s 60ms/step -
accuracy: 1.0000 - loss: 0.6136
Epoch 1584/2000
1/1 0s 58ms/step -
accuracy: 1.0000 - loss: 0.6134
Epoch 1585/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.6132
Epoch 1586/2000
1/1 0s 63ms/step -
accuracy: 1.0000 - loss: 0.6129
Epoch 1587/2000
1/1 0s 102ms/step -
accuracy: 1.0000 - loss: 0.6127
Epoch 1588/2000
1/1 0s 85ms/step -
accuracy: 1.0000 - loss: 0.6125
Epoch 1589/2000
1/1 0s 89ms/step -
accuracy: 1.0000 - loss: 0.6123
Epoch 1590/2000
1/1 0s 104ms/step -
accuracy: 1.0000 - loss: 0.6120
Epoch 1591/2000
1/1 0s 105ms/step -
accuracy: 1.0000 - loss: 0.6118
Epoch 1592/2000
1/1 0s 85ms/step -
accuracy: 1.0000 - loss: 0.6116
Epoch 1593/2000
1/1 0s 69ms/step -
accuracy: 1.0000 - loss: 0.6114
Epoch 1594/2000
1/1 0s 69ms/step -
accuracy: 1.0000 - loss: 0.6111
Epoch 1595/2000
1/1 0s 72ms/step -
accuracy: 1.0000 - loss: 0.6109
Epoch 1596/2000
1/1 0s 71ms/step -
accuracy: 1.0000 - loss: 0.6107
Epoch 1597/2000
1/1 0s 71ms/step -

accuracy: 1.0000 - loss: 0.6104
Epoch 1598/2000
1/1 0s 63ms/step -
accuracy: 1.0000 - loss: 0.6102
Epoch 1599/2000
1/1 0s 59ms/step -
accuracy: 1.0000 - loss: 0.6100
Epoch 1600/2000
1/1 0s 67ms/step -
accuracy: 1.0000 - loss: 0.6098
Epoch 1601/2000
1/1 0s 66ms/step -
accuracy: 1.0000 - loss: 0.6095
Epoch 1602/2000
1/1 0s 84ms/step -
accuracy: 1.0000 - loss: 0.6093
Epoch 1603/2000
1/1 0s 55ms/step -
accuracy: 1.0000 - loss: 0.6091
Epoch 1604/2000
1/1 0s 120ms/step -
accuracy: 1.0000 - loss: 0.6088
Epoch 1605/2000
1/1 0s 63ms/step -
accuracy: 1.0000 - loss: 0.6086
Epoch 1606/2000
1/1 0s 66ms/step -
accuracy: 1.0000 - loss: 0.6084
Epoch 1607/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.6081
Epoch 1608/2000
1/1 0s 60ms/step -
accuracy: 1.0000 - loss: 0.6079
Epoch 1609/2000
1/1 0s 59ms/step -
accuracy: 1.0000 - loss: 0.6076
Epoch 1610/2000
1/1 0s 54ms/step -
accuracy: 1.0000 - loss: 0.6074
Epoch 1611/2000
1/1 0s 106ms/step -
accuracy: 1.0000 - loss: 0.6072
Epoch 1612/2000
1/1 0s 52ms/step -
accuracy: 1.0000 - loss: 0.6069
Epoch 1613/2000
1/1 0s 57ms/step -

accuracy: 1.0000 - loss: 0.6067
Epoch 1614/2000
1/1 0s 66ms/step -
accuracy: 1.0000 - loss: 0.6065
Epoch 1615/2000
1/1 0s 53ms/step -
accuracy: 1.0000 - loss: 0.6062
Epoch 1616/2000
1/1 0s 62ms/step -
accuracy: 1.0000 - loss: 0.6060
Epoch 1617/2000
1/1 0s 54ms/step -
accuracy: 1.0000 - loss: 0.6057
Epoch 1618/2000
1/1 0s 62ms/step -
accuracy: 1.0000 - loss: 0.6055
Epoch 1619/2000
1/1 0s 49ms/step -
accuracy: 1.0000 - loss: 0.6053
Epoch 1620/2000
1/1 0s 110ms/step -
accuracy: 1.0000 - loss: 0.6050
Epoch 1621/2000
1/1 0s 68ms/step -
accuracy: 1.0000 - loss: 0.6048
Epoch 1622/2000
1/1 0s 64ms/step -
accuracy: 1.0000 - loss: 0.6045
Epoch 1623/2000
1/1 0s 75ms/step -
accuracy: 1.0000 - loss: 0.6043
Epoch 1624/2000
1/1 0s 71ms/step -
accuracy: 1.0000 - loss: 0.6040
Epoch 1625/2000
1/1 0s 108ms/step -
accuracy: 1.0000 - loss: 0.6038
Epoch 1626/2000
1/1 0s 68ms/step -
accuracy: 1.0000 - loss: 0.6036
Epoch 1627/2000
1/1 0s 82ms/step -
accuracy: 1.0000 - loss: 0.6033
Epoch 1628/2000
1/1 0s 59ms/step -
accuracy: 1.0000 - loss: 0.6031
Epoch 1629/2000
1/1 0s 54ms/step -

accuracy: 1.0000 - loss: 0.6028
Epoch 1630/2000
1/1 0s 55ms/step -
accuracy: 1.0000 - loss: 0.6026
Epoch 1631/2000
1/1 0s 59ms/step -
accuracy: 1.0000 - loss: 0.6023
Epoch 1632/2000
1/1 0s 61ms/step -
accuracy: 1.0000 - loss: 0.6021
Epoch 1633/2000
1/1 0s 99ms/step -
accuracy: 1.0000 - loss: 0.6018
Epoch 1634/2000
1/1 0s 65ms/step -
accuracy: 1.0000 - loss: 0.6016
Epoch 1635/2000
1/1 0s 54ms/step -
accuracy: 1.0000 - loss: 0.6013
Epoch 1636/2000
1/1 0s 56ms/step -
accuracy: 1.0000 - loss: 0.6011
Epoch 1637/2000
1/1 0s 59ms/step -
accuracy: 1.0000 - loss: 0.6008
Epoch 1638/2000
1/1 0s 61ms/step -
accuracy: 1.0000 - loss: 0.6006
Epoch 1639/2000
1/1 0s 65ms/step -
accuracy: 1.0000 - loss: 0.6003
Epoch 1640/2000
1/1 0s 55ms/step -
accuracy: 1.0000 - loss: 0.6001
Epoch 1641/2000
1/1 0s 59ms/step -
accuracy: 1.0000 - loss: 0.5998
Epoch 1642/2000
1/1 0s 58ms/step -
accuracy: 1.0000 - loss: 0.5996
Epoch 1643/2000
1/1 0s 56ms/step -
accuracy: 1.0000 - loss: 0.5993
Epoch 1644/2000
1/1 0s 63ms/step -
accuracy: 1.0000 - loss: 0.5991
Epoch 1645/2000
1/1 0s 115ms/step -

accuracy: 1.0000 - loss: 0.5988
Epoch 1646/2000
1/1 0s 53ms/step -
accuracy: 1.0000 - loss: 0.5985
Epoch 1647/2000
1/1 0s 56ms/step -
accuracy: 1.0000 - loss: 0.5983
Epoch 1648/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5980
Epoch 1649/2000
1/1 0s 53ms/step -
accuracy: 1.0000 - loss: 0.5978
Epoch 1650/2000
1/1 0s 53ms/step -
accuracy: 1.0000 - loss: 0.5975
Epoch 1651/2000
1/1 0s 52ms/step -
accuracy: 1.0000 - loss: 0.5973
Epoch 1652/2000
1/1 0s 98ms/step -
accuracy: 1.0000 - loss: 0.5970
Epoch 1653/2000
1/1 0s 56ms/step -
accuracy: 1.0000 - loss: 0.5967
Epoch 1654/2000
1/1 0s 60ms/step -
accuracy: 1.0000 - loss: 0.5965
Epoch 1655/2000
1/1 0s 61ms/step -
accuracy: 1.0000 - loss: 0.5962
Epoch 1656/2000
1/1 0s 47ms/step -
accuracy: 1.0000 - loss: 0.5960
Epoch 1657/2000
1/1 0s 51ms/step -
accuracy: 1.0000 - loss: 0.5957
Epoch 1658/2000
1/1 0s 48ms/step -
accuracy: 1.0000 - loss: 0.5954
Epoch 1659/2000
1/1 0s 59ms/step -
accuracy: 1.0000 - loss: 0.5952
Epoch 1660/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5949
Epoch 1661/2000
1/1 0s 59ms/step -

accuracy: 1.0000 - loss: 0.5946
Epoch 1662/2000
1/1 0s 58ms/step -
accuracy: 1.0000 - loss: 0.5944
Epoch 1663/2000
1/1 0s 50ms/step -
accuracy: 1.0000 - loss: 0.5941
Epoch 1664/2000
1/1 0s 52ms/step -
accuracy: 1.0000 - loss: 0.5939
Epoch 1665/2000
1/1 0s 60ms/step -
accuracy: 1.0000 - loss: 0.5936
Epoch 1666/2000
1/1 0s 84ms/step -
accuracy: 1.0000 - loss: 0.5933
Epoch 1667/2000
1/1 0s 69ms/step -
accuracy: 1.0000 - loss: 0.5931
Epoch 1668/2000
1/1 0s 74ms/step -
accuracy: 1.0000 - loss: 0.5928
Epoch 1669/2000
1/1 0s 58ms/step -
accuracy: 1.0000 - loss: 0.5925
Epoch 1670/2000
1/1 0s 60ms/step -
accuracy: 1.0000 - loss: 0.5923
Epoch 1671/2000
1/1 0s 63ms/step -
accuracy: 1.0000 - loss: 0.5920
Epoch 1672/2000
1/1 0s 59ms/step -
accuracy: 1.0000 - loss: 0.5917
Epoch 1673/2000
1/1 0s 56ms/step -
accuracy: 1.0000 - loss: 0.5914
Epoch 1674/2000
1/1 0s 53ms/step -
accuracy: 1.0000 - loss: 0.5912
Epoch 1675/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5909
Epoch 1676/2000
1/1 0s 56ms/step -
accuracy: 1.0000 - loss: 0.5906
Epoch 1677/2000
1/1 0s 56ms/step -

accuracy: 1.0000 - loss: 0.5904
Epoch 1678/2000
1/1 0s 102ms/step -
accuracy: 1.0000 - loss: 0.5901
Epoch 1679/2000
1/1 0s 64ms/step -
accuracy: 1.0000 - loss: 0.5898
Epoch 1680/2000
1/1 0s 63ms/step -
accuracy: 1.0000 - loss: 0.5896
Epoch 1681/2000
1/1 0s 68ms/step -
accuracy: 1.0000 - loss: 0.5893
Epoch 1682/2000
1/1 0s 72ms/step -
accuracy: 1.0000 - loss: 0.5890
Epoch 1683/2000
1/1 0s 66ms/step -
accuracy: 1.0000 - loss: 0.5887
Epoch 1684/2000
1/1 0s 61ms/step -
accuracy: 1.0000 - loss: 0.5885
Epoch 1685/2000
1/1 0s 59ms/step -
accuracy: 1.0000 - loss: 0.5882
Epoch 1686/2000
1/1 0s 54ms/step -
accuracy: 1.0000 - loss: 0.5879
Epoch 1687/2000
1/1 0s 54ms/step -
accuracy: 1.0000 - loss: 0.5876
Epoch 1688/2000
1/1 0s 64ms/step -
accuracy: 1.0000 - loss: 0.5874
Epoch 1689/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5871
Epoch 1690/2000
1/1 0s 61ms/step -
accuracy: 1.0000 - loss: 0.5868
Epoch 1691/2000
1/1 0s 62ms/step -
accuracy: 1.0000 - loss: 0.5865
Epoch 1692/2000
1/1 0s 115ms/step -
accuracy: 1.0000 - loss: 0.5862
Epoch 1693/2000
1/1 0s 66ms/step -

accuracy: 1.0000 - loss: 0.5860
Epoch 1694/2000
1/1 0s 69ms/step -
accuracy: 1.0000 - loss: 0.5857
Epoch 1695/2000
1/1 0s 69ms/step -
accuracy: 1.0000 - loss: 0.5854
Epoch 1696/2000
1/1 0s 73ms/step -
accuracy: 1.0000 - loss: 0.5851
Epoch 1697/2000
1/1 0s 54ms/step -
accuracy: 1.0000 - loss: 0.5848
Epoch 1698/2000
1/1 0s 111ms/step -
accuracy: 1.0000 - loss: 0.5846
Epoch 1699/2000
1/1 0s 65ms/step -
accuracy: 1.0000 - loss: 0.5843
Epoch 1700/2000
1/1 0s 56ms/step -
accuracy: 1.0000 - loss: 0.5840
Epoch 1701/2000
1/1 0s 64ms/step -
accuracy: 1.0000 - loss: 0.5837
Epoch 1702/2000
1/1 0s 50ms/step -
accuracy: 1.0000 - loss: 0.5834
Epoch 1703/2000
1/1 0s 54ms/step -
accuracy: 1.0000 - loss: 0.5832
Epoch 1704/2000
1/1 0s 49ms/step -
accuracy: 1.0000 - loss: 0.5829
Epoch 1705/2000
1/1 0s 56ms/step -
accuracy: 1.0000 - loss: 0.5826
Epoch 1706/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5823
Epoch 1707/2000
1/1 0s 70ms/step -
accuracy: 1.0000 - loss: 0.5820
Epoch 1708/2000
1/1 0s 70ms/step -
accuracy: 1.0000 - loss: 0.5817
Epoch 1709/2000
1/1 0s 69ms/step -

accuracy: 1.0000 - loss: 0.5815
Epoch 1710/2000
1/1 0s 52ms/step -
accuracy: 1.0000 - loss: 0.5812
Epoch 1711/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5809
Epoch 1712/2000
1/1 0s 59ms/step -
accuracy: 1.0000 - loss: 0.5806
Epoch 1713/2000
1/1 0s 61ms/step -
accuracy: 1.0000 - loss: 0.5803
Epoch 1714/2000
1/1 0s 59ms/step -
accuracy: 1.0000 - loss: 0.5800
Epoch 1715/2000
1/1 0s 67ms/step -
accuracy: 1.0000 - loss: 0.5797
Epoch 1716/2000
1/1 0s 62ms/step -
accuracy: 1.0000 - loss: 0.5794
Epoch 1717/2000
1/1 0s 59ms/step -
accuracy: 1.0000 - loss: 0.5792
Epoch 1718/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5789
Epoch 1719/2000
1/1 0s 54ms/step -
accuracy: 1.0000 - loss: 0.5786
Epoch 1720/2000
1/1 0s 55ms/step -
accuracy: 1.0000 - loss: 0.5783
Epoch 1721/2000
1/1 0s 65ms/step -
accuracy: 1.0000 - loss: 0.5780
Epoch 1722/2000
1/1 0s 80ms/step -
accuracy: 1.0000 - loss: 0.5777
Epoch 1723/2000
1/1 0s 53ms/step -
accuracy: 1.0000 - loss: 0.5774
Epoch 1724/2000
1/1 0s 55ms/step -
accuracy: 1.0000 - loss: 0.5771
Epoch 1725/2000
1/1 0s 47ms/step -

accuracy: 1.0000 - loss: 0.5768
Epoch 1726/2000
1/1 0s 51ms/step -
accuracy: 1.0000 - loss: 0.5765
Epoch 1727/2000
1/1 0s 100ms/step -
accuracy: 1.0000 - loss: 0.5762
Epoch 1728/2000
1/1 0s 62ms/step -
accuracy: 1.0000 - loss: 0.5760
Epoch 1729/2000
1/1 0s 60ms/step -
accuracy: 1.0000 - loss: 0.5757
Epoch 1730/2000
1/1 0s 56ms/step -
accuracy: 1.0000 - loss: 0.5754
Epoch 1731/2000
1/1 0s 66ms/step -
accuracy: 1.0000 - loss: 0.5751
Epoch 1732/2000
1/1 0s 58ms/step -
accuracy: 1.0000 - loss: 0.5748
Epoch 1733/2000
1/1 0s 104ms/step -
accuracy: 1.0000 - loss: 0.5745
Epoch 1734/2000
1/1 0s 74ms/step -
accuracy: 1.0000 - loss: 0.5742
Epoch 1735/2000
1/1 0s 53ms/step -
accuracy: 1.0000 - loss: 0.5739
Epoch 1736/2000
1/1 0s 60ms/step -
accuracy: 1.0000 - loss: 0.5736
Epoch 1737/2000
1/1 0s 66ms/step -
accuracy: 1.0000 - loss: 0.5733
Epoch 1738/2000
1/1 0s 50ms/step -
accuracy: 1.0000 - loss: 0.5730
Epoch 1739/2000
1/1 0s 60ms/step -
accuracy: 1.0000 - loss: 0.5727
Epoch 1740/2000
1/1 0s 47ms/step -
accuracy: 1.0000 - loss: 0.5724
Epoch 1741/2000
1/1 0s 54ms/step -

accuracy: 1.0000 - loss: 0.5721
Epoch 1742/2000
1/1 0s 54ms/step -
accuracy: 1.0000 - loss: 0.5718
Epoch 1743/2000
1/1 0s 56ms/step -
accuracy: 1.0000 - loss: 0.5715
Epoch 1744/2000
1/1 0s 54ms/step -
accuracy: 1.0000 - loss: 0.5712
Epoch 1745/2000
1/1 0s 60ms/step -
accuracy: 1.0000 - loss: 0.5709
Epoch 1746/2000
1/1 0s 127ms/step -
accuracy: 1.0000 - loss: 0.5706
Epoch 1747/2000
1/1 0s 78ms/step -
accuracy: 1.0000 - loss: 0.5703
Epoch 1748/2000
1/1 0s 82ms/step -
accuracy: 1.0000 - loss: 0.5700
Epoch 1749/2000
1/1 0s 117ms/step -
accuracy: 1.0000 - loss: 0.5697
Epoch 1750/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5694
Epoch 1751/2000
1/1 0s 53ms/step -
accuracy: 1.0000 - loss: 0.5691
Epoch 1752/2000
1/1 0s 60ms/step -
accuracy: 1.0000 - loss: 0.5688
Epoch 1753/2000
1/1 0s 65ms/step -
accuracy: 1.0000 - loss: 0.5685
Epoch 1754/2000
1/1 0s 121ms/step -
accuracy: 1.0000 - loss: 0.5682
Epoch 1755/2000
1/1 0s 61ms/step -
accuracy: 1.0000 - loss: 0.5679
Epoch 1756/2000
1/1 0s 64ms/step -
accuracy: 1.0000 - loss: 0.5676
Epoch 1757/2000
1/1 0s 71ms/step -

accuracy: 1.0000 - loss: 0.5673
Epoch 1758/2000
1/1 0s 117ms/step -
accuracy: 1.0000 - loss: 0.5670
Epoch 1759/2000
1/1 0s 64ms/step -
accuracy: 1.0000 - loss: 0.5667
Epoch 1760/2000
1/1 0s 52ms/step -
accuracy: 1.0000 - loss: 0.5664
Epoch 1761/2000
1/1 0s 64ms/step -
accuracy: 1.0000 - loss: 0.5661
Epoch 1762/2000
1/1 0s 89ms/step -
accuracy: 1.0000 - loss: 0.5658
Epoch 1763/2000
1/1 0s 55ms/step -
accuracy: 1.0000 - loss: 0.5655
Epoch 1764/2000
1/1 0s 64ms/step -
accuracy: 1.0000 - loss: 0.5652
Epoch 1765/2000
1/1 0s 65ms/step -
accuracy: 1.0000 - loss: 0.5649
Epoch 1766/2000
1/1 0s 59ms/step -
accuracy: 1.0000 - loss: 0.5646
Epoch 1767/2000
1/1 0s 108ms/step -
accuracy: 1.0000 - loss: 0.5643
Epoch 1768/2000
1/1 0s 50ms/step -
accuracy: 1.0000 - loss: 0.5639
Epoch 1769/2000
1/1 0s 55ms/step -
accuracy: 1.0000 - loss: 0.5636
Epoch 1770/2000
1/1 0s 48ms/step -
accuracy: 1.0000 - loss: 0.5633
Epoch 1771/2000
1/1 0s 51ms/step -
accuracy: 1.0000 - loss: 0.5630
Epoch 1772/2000
1/1 0s 53ms/step -
accuracy: 1.0000 - loss: 0.5627
Epoch 1773/2000
1/1 0s 58ms/step -

accuracy: 1.0000 - loss: 0.5624
Epoch 1774/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5621
Epoch 1775/2000
1/1 0s 84ms/step -
accuracy: 1.0000 - loss: 0.5618
Epoch 1776/2000
1/1 0s 77ms/step -
accuracy: 1.0000 - loss: 0.5615
Epoch 1777/2000
1/1 0s 87ms/step -
accuracy: 1.0000 - loss: 0.5612
Epoch 1778/2000
1/1 0s 73ms/step -
accuracy: 1.0000 - loss: 0.5609
Epoch 1779/2000
1/1 0s 135ms/step -
accuracy: 1.0000 - loss: 0.5606
Epoch 1780/2000
1/1 0s 78ms/step -
accuracy: 1.0000 - loss: 0.5602
Epoch 1781/2000
1/1 0s 63ms/step -
accuracy: 1.0000 - loss: 0.5599
Epoch 1782/2000
1/1 0s 59ms/step -
accuracy: 1.0000 - loss: 0.5596
Epoch 1783/2000
1/1 0s 58ms/step -
accuracy: 1.0000 - loss: 0.5593
Epoch 1784/2000
1/1 0s 58ms/step -
accuracy: 1.0000 - loss: 0.5590
Epoch 1785/2000
1/1 0s 55ms/step -
accuracy: 1.0000 - loss: 0.5587
Epoch 1786/2000
1/1 0s 51ms/step -
accuracy: 1.0000 - loss: 0.5584
Epoch 1787/2000
1/1 0s 71ms/step -
accuracy: 1.0000 - loss: 0.5581
Epoch 1788/2000
1/1 0s 74ms/step -
accuracy: 1.0000 - loss: 0.5577
Epoch 1789/2000
1/1 0s 64ms/step -

accuracy: 1.0000 - loss: 0.5574
Epoch 1790/2000
1/1 0s 66ms/step -
accuracy: 1.0000 - loss: 0.5571
Epoch 1791/2000
1/1 0s 64ms/step -
accuracy: 1.0000 - loss: 0.5568
Epoch 1792/2000
1/1 0s 62ms/step -
accuracy: 1.0000 - loss: 0.5565
Epoch 1793/2000
1/1 0s 64ms/step -
accuracy: 1.0000 - loss: 0.5562
Epoch 1794/2000
1/1 0s 66ms/step -
accuracy: 1.0000 - loss: 0.5559
Epoch 1795/2000
1/1 0s 116ms/step -
accuracy: 1.0000 - loss: 0.5556
Epoch 1796/2000
1/1 0s 59ms/step -
accuracy: 1.0000 - loss: 0.5552
Epoch 1797/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5549
Epoch 1798/2000
1/1 0s 62ms/step -
accuracy: 1.0000 - loss: 0.5546
Epoch 1799/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5543
Epoch 1800/2000
1/1 0s 89ms/step -
accuracy: 1.0000 - loss: 0.5540
Epoch 1801/2000
1/1 0s 111ms/step -
accuracy: 1.0000 - loss: 0.5537
Epoch 1802/2000
1/1 0s 58ms/step -
accuracy: 1.0000 - loss: 0.5533
Epoch 1803/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5530
Epoch 1804/2000
1/1 0s 87ms/step -
accuracy: 1.0000 - loss: 0.5527
Epoch 1805/2000
1/1 0s 55ms/step -

accuracy: 1.0000 - loss: 0.5524
Epoch 1806/2000
1/1 0s 107ms/step -
accuracy: 1.0000 - loss: 0.5521
Epoch 1807/2000
1/1 0s 87ms/step -
accuracy: 1.0000 - loss: 0.5518
Epoch 1808/2000
1/1 0s 58ms/step -
accuracy: 1.0000 - loss: 0.5514
Epoch 1809/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5511
Epoch 1810/2000
1/1 0s 55ms/step -
accuracy: 1.0000 - loss: 0.5508
Epoch 1811/2000
1/1 0s 51ms/step -
accuracy: 1.0000 - loss: 0.5505
Epoch 1812/2000
1/1 0s 52ms/step -
accuracy: 1.0000 - loss: 0.5502
Epoch 1813/2000
1/1 0s 51ms/step -
accuracy: 1.0000 - loss: 0.5498
Epoch 1814/2000
1/1 0s 61ms/step -
accuracy: 1.0000 - loss: 0.5495
Epoch 1815/2000
1/1 0s 50ms/step -
accuracy: 1.0000 - loss: 0.5492
Epoch 1816/2000
1/1 0s 52ms/step -
accuracy: 1.0000 - loss: 0.5489
Epoch 1817/2000
1/1 0s 53ms/step -
accuracy: 1.0000 - loss: 0.5486
Epoch 1818/2000
1/1 0s 85ms/step -
accuracy: 1.0000 - loss: 0.5482
Epoch 1819/2000
1/1 0s 58ms/step -
accuracy: 1.0000 - loss: 0.5479
Epoch 1820/2000
1/1 0s 69ms/step -
accuracy: 1.0000 - loss: 0.5476
Epoch 1821/2000
1/1 0s 71ms/step -

accuracy: 1.0000 - loss: 0.5473
Epoch 1822/2000
1/1 0s 50ms/step -
accuracy: 1.0000 - loss: 0.5470
Epoch 1823/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5466
Epoch 1824/2000
1/1 0s 54ms/step -
accuracy: 1.0000 - loss: 0.5463
Epoch 1825/2000
1/1 0s 62ms/step -
accuracy: 1.0000 - loss: 0.5460
Epoch 1826/2000
1/1 0s 51ms/step -
accuracy: 1.0000 - loss: 0.5457
Epoch 1827/2000
1/1 0s 54ms/step -
accuracy: 1.0000 - loss: 0.5453
Epoch 1828/2000
1/1 0s 66ms/step -
accuracy: 1.0000 - loss: 0.5450
Epoch 1829/2000
1/1 0s 60ms/step -
accuracy: 1.0000 - loss: 0.5447
Epoch 1830/2000
1/1 0s 53ms/step -
accuracy: 1.0000 - loss: 0.5444
Epoch 1831/2000
1/1 0s 69ms/step -
accuracy: 1.0000 - loss: 0.5441
Epoch 1832/2000
1/1 0s 56ms/step -
accuracy: 1.0000 - loss: 0.5437
Epoch 1833/2000
1/1 0s 68ms/step -
accuracy: 1.0000 - loss: 0.5434
Epoch 1834/2000
1/1 0s 121ms/step -
accuracy: 1.0000 - loss: 0.5431
Epoch 1835/2000
1/1 0s 67ms/step -
accuracy: 1.0000 - loss: 0.5428
Epoch 1836/2000
1/1 0s 63ms/step -
accuracy: 1.0000 - loss: 0.5424
Epoch 1837/2000
1/1 0s 53ms/step -

accuracy: 1.0000 - loss: 0.5421
Epoch 1838/2000
1/1 0s 63ms/step -
accuracy: 1.0000 - loss: 0.5418
Epoch 1839/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5415
Epoch 1840/2000
1/1 0s 62ms/step -
accuracy: 1.0000 - loss: 0.5411
Epoch 1841/2000
1/1 0s 58ms/step -
accuracy: 1.0000 - loss: 0.5408
Epoch 1842/2000
1/1 0s 116ms/step -
accuracy: 1.0000 - loss: 0.5405
Epoch 1843/2000
1/1 0s 58ms/step -
accuracy: 1.0000 - loss: 0.5402
Epoch 1844/2000
1/1 0s 55ms/step -
accuracy: 1.0000 - loss: 0.5398
Epoch 1845/2000
1/1 0s 66ms/step -
accuracy: 1.0000 - loss: 0.5395
Epoch 1846/2000
1/1 0s 75ms/step -
accuracy: 1.0000 - loss: 0.5392
Epoch 1847/2000
1/1 0s 106ms/step -
accuracy: 1.0000 - loss: 0.5388
Epoch 1848/2000
1/1 0s 90ms/step -
accuracy: 1.0000 - loss: 0.5385
Epoch 1849/2000
1/1 0s 55ms/step -
accuracy: 1.0000 - loss: 0.5382
Epoch 1850/2000
1/1 0s 65ms/step -
accuracy: 1.0000 - loss: 0.5379
Epoch 1851/2000
1/1 0s 61ms/step -
accuracy: 1.0000 - loss: 0.5375
Epoch 1852/2000
1/1 0s 61ms/step -
accuracy: 1.0000 - loss: 0.5372
Epoch 1853/2000
1/1 0s 58ms/step -

accuracy: 1.0000 - loss: 0.5369
Epoch 1854/2000
1/1 0s 69ms/step -
accuracy: 1.0000 - loss: 0.5366
Epoch 1855/2000
1/1 0s 63ms/step -
accuracy: 1.0000 - loss: 0.5362
Epoch 1856/2000
1/1 0s 58ms/step -
accuracy: 1.0000 - loss: 0.5359
Epoch 1857/2000
1/1 0s 53ms/step -
accuracy: 1.0000 - loss: 0.5356
Epoch 1858/2000
1/1 0s 52ms/step -
accuracy: 1.0000 - loss: 0.5352
Epoch 1859/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5349
Epoch 1860/2000
1/1 0s 68ms/step -
accuracy: 1.0000 - loss: 0.5346
Epoch 1861/2000
1/1 0s 59ms/step -
accuracy: 1.0000 - loss: 0.5342
Epoch 1862/2000
1/1 0s 81ms/step -
accuracy: 1.0000 - loss: 0.5339
Epoch 1863/2000
1/1 0s 93ms/step -
accuracy: 1.0000 - loss: 0.5336
Epoch 1864/2000
1/1 0s 65ms/step -
accuracy: 1.0000 - loss: 0.5333
Epoch 1865/2000
1/1 0s 62ms/step -
accuracy: 1.0000 - loss: 0.5329
Epoch 1866/2000
1/1 0s 62ms/step -
accuracy: 1.0000 - loss: 0.5326
Epoch 1867/2000
1/1 0s 63ms/step -
accuracy: 1.0000 - loss: 0.5323
Epoch 1868/2000
1/1 0s 63ms/step -
accuracy: 1.0000 - loss: 0.5319
Epoch 1869/2000
1/1 0s 55ms/step -

accuracy: 1.0000 - loss: 0.5316
Epoch 1870/2000
1/1 0s 66ms/step -
accuracy: 1.0000 - loss: 0.5313
Epoch 1871/2000
1/1 0s 70ms/step -
accuracy: 1.0000 - loss: 0.5309
Epoch 1872/2000
1/1 0s 56ms/step -
accuracy: 1.0000 - loss: 0.5306
Epoch 1873/2000
1/1 0s 100ms/step -
accuracy: 1.0000 - loss: 0.5303
Epoch 1874/2000
1/1 0s 69ms/step -
accuracy: 1.0000 - loss: 0.5299
Epoch 1875/2000
1/1 0s 91ms/step -
accuracy: 1.0000 - loss: 0.5296
Epoch 1876/2000
1/1 0s 71ms/step -
accuracy: 1.0000 - loss: 0.5293
Epoch 1877/2000
1/1 0s 65ms/step -
accuracy: 1.0000 - loss: 0.5289
Epoch 1878/2000
1/1 0s 61ms/step -
accuracy: 1.0000 - loss: 0.5286
Epoch 1879/2000
1/1 0s 53ms/step -
accuracy: 1.0000 - loss: 0.5283
Epoch 1880/2000
1/1 0s 47ms/step -
accuracy: 1.0000 - loss: 0.5279
Epoch 1881/2000
1/1 0s 95ms/step -
accuracy: 1.0000 - loss: 0.5276
Epoch 1882/2000
1/1 0s 62ms/step -
accuracy: 1.0000 - loss: 0.5273
Epoch 1883/2000
1/1 0s 60ms/step -
accuracy: 1.0000 - loss: 0.5269
Epoch 1884/2000
1/1 0s 55ms/step -
accuracy: 1.0000 - loss: 0.5266
Epoch 1885/2000
1/1 0s 84ms/step -

accuracy: 1.0000 - loss: 0.5263
Epoch 1886/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5259
Epoch 1887/2000
1/1 0s 63ms/step -
accuracy: 1.0000 - loss: 0.5256
Epoch 1888/2000
1/1 0s 60ms/step -
accuracy: 1.0000 - loss: 0.5253
Epoch 1889/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5249
Epoch 1890/2000
1/1 0s 64ms/step -
accuracy: 1.0000 - loss: 0.5246
Epoch 1891/2000
1/1 0s 65ms/step -
accuracy: 1.0000 - loss: 0.5243
Epoch 1892/2000
1/1 0s 96ms/step -
accuracy: 1.0000 - loss: 0.5239
Epoch 1893/2000
1/1 0s 58ms/step -
accuracy: 1.0000 - loss: 0.5236
Epoch 1894/2000
1/1 0s 55ms/step -
accuracy: 1.0000 - loss: 0.5233
Epoch 1895/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5229
Epoch 1896/2000
1/1 0s 66ms/step -
accuracy: 1.0000 - loss: 0.5226
Epoch 1897/2000
1/1 0s 59ms/step -
accuracy: 1.0000 - loss: 0.5223
Epoch 1898/2000
1/1 0s 52ms/step -
accuracy: 1.0000 - loss: 0.5219
Epoch 1899/2000
1/1 0s 63ms/step -
accuracy: 1.0000 - loss: 0.5216
Epoch 1900/2000
1/1 0s 106ms/step -
accuracy: 1.0000 - loss: 0.5212
Epoch 1901/2000
1/1 0s 50ms/step -

accuracy: 1.0000 - loss: 0.5209
Epoch 1902/2000
1/1 0s 54ms/step -
accuracy: 1.0000 - loss: 0.5206
Epoch 1903/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5202
Epoch 1904/2000
1/1 0s 61ms/step -
accuracy: 1.0000 - loss: 0.5199
Epoch 1905/2000
1/1 0s 55ms/step -
accuracy: 1.0000 - loss: 0.5196
Epoch 1906/2000
1/1 0s 46ms/step -
accuracy: 1.0000 - loss: 0.5192
Epoch 1907/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5189
Epoch 1908/2000
1/1 0s 54ms/step -
accuracy: 1.0000 - loss: 0.5185
Epoch 1909/2000
1/1 0s 54ms/step -
accuracy: 1.0000 - loss: 0.5182
Epoch 1910/2000
1/1 0s 94ms/step -
accuracy: 1.0000 - loss: 0.5179
Epoch 1911/2000
1/1 0s 68ms/step -
accuracy: 1.0000 - loss: 0.5175
Epoch 1912/2000
1/1 0s 64ms/step -
accuracy: 1.0000 - loss: 0.5172
Epoch 1913/2000
1/1 0s 62ms/step -
accuracy: 1.0000 - loss: 0.5169
Epoch 1914/2000
1/1 0s 62ms/step -
accuracy: 1.0000 - loss: 0.5165
Epoch 1915/2000
1/1 0s 60ms/step -
accuracy: 1.0000 - loss: 0.5162
Epoch 1916/2000
1/1 0s 50ms/step -
accuracy: 1.0000 - loss: 0.5158
Epoch 1917/2000
1/1 0s 55ms/step -

accuracy: 1.0000 - loss: 0.5155
Epoch 1918/2000
1/1 0s 59ms/step -
accuracy: 1.0000 - loss: 0.5152
Epoch 1919/2000
1/1 0s 58ms/step -
accuracy: 1.0000 - loss: 0.5148
Epoch 1920/2000
1/1 0s 68ms/step -
accuracy: 1.0000 - loss: 0.5145
Epoch 1921/2000
1/1 0s 72ms/step -
accuracy: 1.0000 - loss: 0.5141
Epoch 1922/2000
1/1 0s 88ms/step -
accuracy: 1.0000 - loss: 0.5138
Epoch 1923/2000
1/1 0s 48ms/step -
accuracy: 1.0000 - loss: 0.5135
Epoch 1924/2000
1/1 0s 58ms/step -
accuracy: 1.0000 - loss: 0.5131
Epoch 1925/2000
1/1 0s 52ms/step -
accuracy: 1.0000 - loss: 0.5128
Epoch 1926/2000
1/1 0s 52ms/step -
accuracy: 1.0000 - loss: 0.5125
Epoch 1927/2000
1/1 0s 53ms/step -
accuracy: 1.0000 - loss: 0.5121
Epoch 1928/2000
1/1 0s 82ms/step -
accuracy: 1.0000 - loss: 0.5118
Epoch 1929/2000
1/1 0s 79ms/step -
accuracy: 1.0000 - loss: 0.5114
Epoch 1930/2000
1/1 0s 57ms/step -
accuracy: 1.0000 - loss: 0.5111
Epoch 1931/2000
1/1 0s 61ms/step -
accuracy: 1.0000 - loss: 0.5108
Epoch 1932/2000
1/1 0s 47ms/step -
accuracy: 1.0000 - loss: 0.5104
Epoch 1933/2000
1/1 0s 54ms/step -

```

accuracy: 1.0000 - loss: 0.5101
Epoch 1934/2000
1/1          0s 58ms/step -
accuracy: 1.0000 - loss: 0.5097
Epoch 1935/2000
1/1          0s 60ms/step -
accuracy: 1.0000 - loss: 0.5094
Epoch 1936/2000
1/1          0s 57ms/step -
accuracy: 1.0000 - loss: 0.5090
Epoch 1937/2000
1/1          0s 52ms/step -
accuracy: 1.0000 - loss: 0.5087
Epoch 1938/2000
1/1          0s 45ms/step -
accuracy: 1.0000 - loss: 0.5084
Epoch 1939/2000
1/1          0s 56ms/step -
accuracy: 1.0000 - loss: 0.5080
Epoch 1940/2000
1/1          0s 57ms/step -
accuracy: 1.0000 - loss: 0.5077
Epoch 1941/2000
1/1          0s 55ms/step -
accuracy: 1.0000 - loss: 0.5073
Epoch 1942/2000
1/1          0s 55ms/step -
accuracy: 1.0000 - loss: 0.5070
Epoch 1943/2000
1/1          0s 54ms/step -
accuracy: 1.0000 - loss: 0.5067
Epoch 1944/2000
1/1          0s 55ms/step -
accuracy: 1.0000 - loss: 0.5063
Epoch 1945/2000
1/1          0s 46ms/step -
accuracy: 1.0000 - loss: 0.5060
Epoch 1946/2000
1/1          0s 52ms/step -
accuracy: 1.0000 - loss: 0.5056
Epoch 1947/2000
1/1          0s 45ms/step -
accuracy: 1.0000 - loss: 0.5053
Epoch 1948/2000
1/1          0s 63ms/step -
accuracy: 1.0000 - loss: 0.5050
Epoch 1949/2000
1/1          0s 59ms/step -

```

```

accuracy: 1.0000 - loss: 0.5046
Epoch 1950/2000
1/1          0s 51ms/step -
accuracy: 1.0000 - loss: 0.5043
Epoch 1951/2000
1/1          0s 55ms/step -
accuracy: 1.0000 - loss: 0.5039
Epoch 1952/2000
1/1          0s 55ms/step -
accuracy: 1.0000 - loss: 0.5036
Epoch 1953/2000
1/1          0s 66ms/step -
accuracy: 1.0000 - loss: 0.5032
Epoch 1954/2000
1/1          0s 104ms/step -
accuracy: 1.0000 - loss: 0.5029
Epoch 1955/2000
1/1          0s 59ms/step -
accuracy: 1.0000 - loss: 0.5026
Epoch 1956/2000
1/1          0s 53ms/step -
accuracy: 1.0000 - loss: 0.5022
Epoch 1957/2000
1/1          0s 56ms/step -
accuracy: 1.0000 - loss: 0.5019
Epoch 1958/2000
1/1          0s 52ms/step -
accuracy: 1.0000 - loss: 0.5015
Epoch 1959/2000
1/1          0s 105ms/step -
accuracy: 1.0000 - loss: 0.5012
Epoch 1960/2000
1/1          0s 60ms/step -
accuracy: 1.0000 - loss: 0.5008
Epoch 1961/2000
1/1          0s 62ms/step -
accuracy: 1.0000 - loss: 0.5005
Epoch 1962/2000
1/1          0s 47ms/step -
accuracy: 1.0000 - loss: 0.5002
Epoch 1963/2000
1/1          0s 63ms/step -
accuracy: 1.0000 - loss: 0.4998
Epoch 1964/2000
1/1          0s 102ms/step -
accuracy: 1.0000 - loss: 0.4995
Epoch 1965/2000
1/1          0s 62ms/step -

```

```

accuracy: 1.0000 - loss: 0.4991
Epoch 1966/2000
1/1          0s 66ms/step -
accuracy: 1.0000 - loss: 0.4988
Epoch 1967/2000
1/1          0s 66ms/step -
accuracy: 1.0000 - loss: 0.4985
Epoch 1968/2000
1/1          0s 63ms/step -
accuracy: 1.0000 - loss: 0.4981
Epoch 1969/2000
1/1          0s 51ms/step -
accuracy: 1.0000 - loss: 0.4978
Epoch 1970/2000
1/1          0s 50ms/step -
accuracy: 1.0000 - loss: 0.4974
Epoch 1971/2000
1/1          0s 51ms/step -
accuracy: 1.0000 - loss: 0.4971
Epoch 1972/2000
1/1          0s 51ms/step -
accuracy: 1.0000 - loss: 0.4967
Epoch 1973/2000
1/1          0s 60ms/step -
accuracy: 1.0000 - loss: 0.4964
Epoch 1974/2000
1/1          0s 63ms/step -
accuracy: 1.0000 - loss: 0.4960
Epoch 1975/2000
1/1          0s 61ms/step -
accuracy: 1.0000 - loss: 0.4957
Epoch 1976/2000
1/1          0s 63ms/step -
accuracy: 1.0000 - loss: 0.4954
Epoch 1977/2000
1/1          0s 58ms/step -
accuracy: 1.0000 - loss: 0.4950
Epoch 1978/2000
1/1          0s 60ms/step -
accuracy: 1.0000 - loss: 0.4947
Epoch 1979/2000
1/1          0s 60ms/step -
accuracy: 1.0000 - loss: 0.4943
Epoch 1980/2000
1/1          0s 58ms/step -
accuracy: 1.0000 - loss: 0.4940
Epoch 1981/2000
1/1          0s 54ms/step -

```

```

accuracy: 1.0000 - loss: 0.4936
Epoch 1982/2000
1/1          0s 55ms/step -
accuracy: 1.0000 - loss: 0.4933
Epoch 1983/2000
1/1          0s 61ms/step -
accuracy: 1.0000 - loss: 0.4930
Epoch 1984/2000
1/1          0s 76ms/step -
accuracy: 1.0000 - loss: 0.4926
Epoch 1985/2000
1/1          0s 61ms/step -
accuracy: 1.0000 - loss: 0.4923
Epoch 1986/2000
1/1          0s 64ms/step -
accuracy: 1.0000 - loss: 0.4919
Epoch 1987/2000
1/1          0s 63ms/step -
accuracy: 1.0000 - loss: 0.4916
Epoch 1988/2000
1/1          0s 58ms/step -
accuracy: 1.0000 - loss: 0.4912
Epoch 1989/2000
1/1          0s 55ms/step -
accuracy: 1.0000 - loss: 0.4909
Epoch 1990/2000
1/1          0s 54ms/step -
accuracy: 1.0000 - loss: 0.4906
Epoch 1991/2000
1/1          0s 56ms/step -
accuracy: 1.0000 - loss: 0.4902
Epoch 1992/2000
1/1          0s 50ms/step -
accuracy: 1.0000 - loss: 0.4899
Epoch 1993/2000
1/1          0s 66ms/step -
accuracy: 1.0000 - loss: 0.4895
Epoch 1994/2000
1/1          0s 84ms/step -
accuracy: 1.0000 - loss: 0.4892
Epoch 1995/2000
1/1          0s 71ms/step -
accuracy: 1.0000 - loss: 0.4888
Epoch 1996/2000
1/1          0s 62ms/step -
accuracy: 1.0000 - loss: 0.4885
Epoch 1997/2000
1/1          0s 68ms/step -

```

```

accuracy: 1.0000 - loss: 0.4881
Epoch 1998/2000
1/1          0s 71ms/step -
accuracy: 1.0000 - loss: 0.4878
Epoch 1999/2000
1/1          0s 140ms/step -
accuracy: 1.0000 - loss: 0.4875
Epoch 2000/2000
1/1          0s 65ms/step -
accuracy: 1.0000 - loss: 0.4871
XOR Function-- predictions:
1/1          0s 153ms/step
[[0.38582984]
 [0.6600429 ]
 [0.5738014 ]
 [0.3865718 ]]

```

```

[21]: # Plot decision boundary for XOR
xx, yy = np.meshgrid(np.linspace(-1, 2, 200),
                    np.linspace(-1, 2, 200))
grid = np.c_[xx.ravel(), yy.ravel()]

# Predictions on the grid
Z = model.predict(grid)
Z = Z.reshape(xx.shape)

plt.figure(figsize=(6,6))
# Contour plot
plt.contourf(xx, yy, Z, levels=[0,0.5,1], cmap="viridis", alpha=0.6)

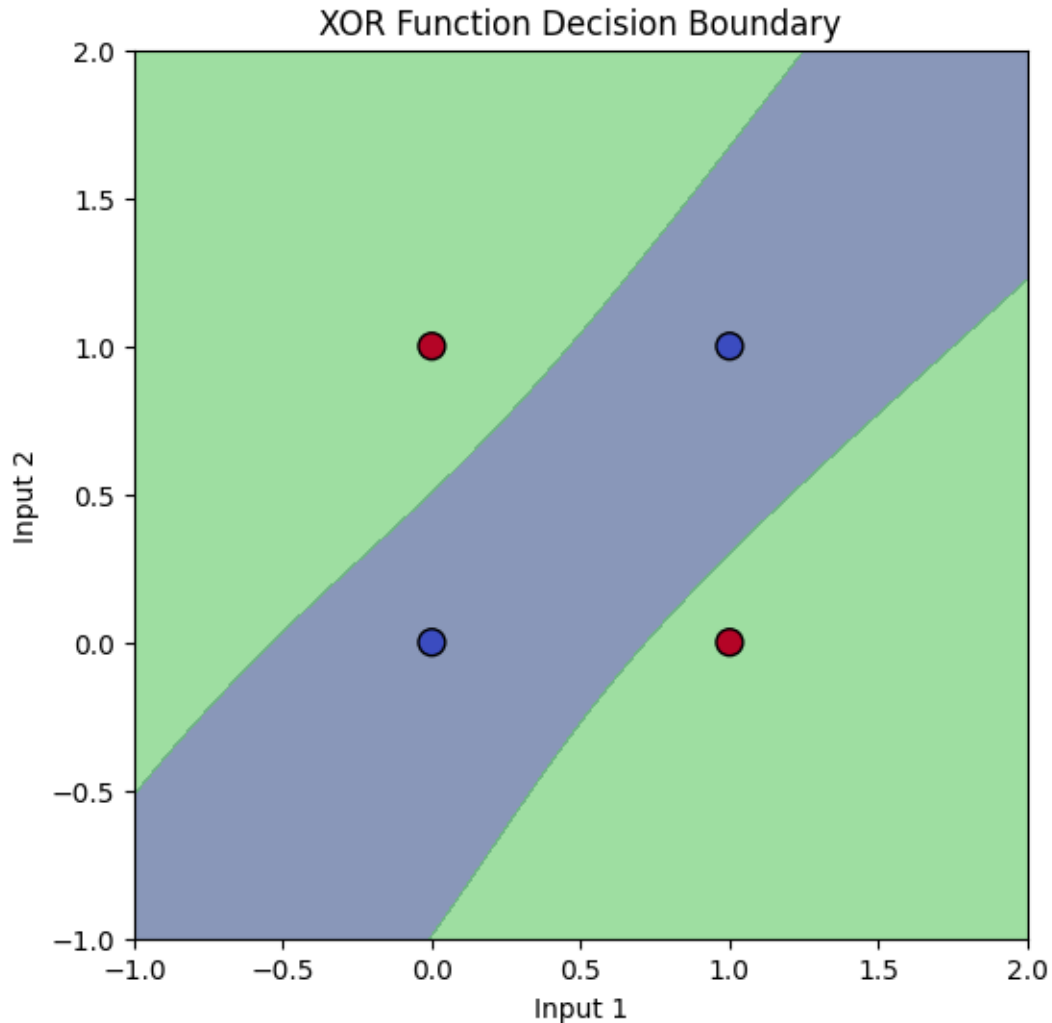
# Scatter plot of original points
plt.scatter(x[:,0], x[:,1], c=y.ravel(), edgecolors='k', cmap="coolwarm", s=100)
plt.title("XOR Function Decision Boundary")
plt.xlabel("Input 1")
plt.ylabel("Input 2")
plt.show()

```

```

1250/1250          1s 600us/step

```



0.4 Q4- Next we will try to recall the logistic regression model that you have seen in your Machine learning Course. With the given dataset 'liver patient.csv' we will first fit a logistic regression model. Then we can see how a deep learning model framework can be used to create a model that does the same job.

0.4.1 importing the necessary libraries

```
[22]: import numpy as np
import pandas as pd
from sklearn.preprocessing import MinMaxScaler
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score
from sklearn.linear_model import LogisticRegression
```


0.4.2 Loading the dataset

```
[24]: df = pd.read_csv("liver_patient.csv")
df
```

```
[24]:
```

	Age	Gender	Total_Bilirubin	Direct_Bilirubin	Alkaline_Phosphotase	\
0	65	Female	0.7	0.1	187	
1	62	Male	10.9	5.5	699	
2	62	Male	7.3	4.1	490	
3	58	Male	1.0	0.4	182	
4	72	Male	3.9	2.0	195	
..	
578	60	Male	0.5	0.1	500	
579	40	Male	0.6	0.1	98	
580	52	Male	0.8	0.2	245	
581	31	Male	1.3	0.5	184	
582	38	Male	1.0	0.3	216	

	Alamine_Aminotransferase	Aspartate_Aminotransferase	Total_Protiens	\
0	16	18	6.8	
1	64	100	7.5	
2	60	68	7.0	
3	14	20	6.8	
4	27	59	7.3	
..	
578	20	34	5.9	
579	35	31	6.0	
580	48	49	6.4	
581	29	32	6.8	
582	21	24	7.3	

	Albumin	Albumin_and_Globulin_Ratio	liver_disease
0	3.3	0.90	1
1	3.2	0.74	1
2	3.3	0.89	1
3	3.4	1.00	1
4	2.4	0.40	1
..
578	1.6	0.37	0
579	3.2	1.10	1
580	3.2	1.00	1
581	3.4	1.00	1
582	4.4	1.50	0

```
[583 rows x 11 columns]
```

0.4.3 Dropping the unnecessary gender column

```
[26]: df.drop('Gender', axis = 1 , inplace = True)
```

0.4.4 Min max scaling

```
[28]: MM = MinMaxScaler()  
X = MM.fit_transform(df)
```

0.4.5 Splitting data into train test split

```
[30]: x = X[:, :9]  
y = X[:, 9]  
x_train, x_test, y_train, y_test = train_test_split(x, y, test_size=0.2,  
↳ random_state=1)
```

```
[31]: logistic_model = LogisticRegression()  
logistic_model.fit(x_train, y_train)  
y_pred = logistic_model.predict(x_test)  
print(f"Accuracy score:{accuracy_score(y_test, y_pred)*100:.2f}%")
```

Accuracy score:71.79%

0.4.6 Using Keras

```
[33]: import keras  
from keras.models import Sequential  
from keras.layers import Dense  
import warnings  
warnings.filterwarnings('ignore')
```

```
[34]: model = Sequential()  
model.add(Dense(1, activation = 'sigmoid', input_shape = (9,)))  
model.summary()
```

Model: "sequential_1"

Layer (type)	Output Shape	Param #
dense_2 (Dense)	(None, 1)	10

Total params: 10 (40.00 B)

Trainable params: 10 (40.00 B)

Non-trainable params: 0 (0.00 B)

```
[35]: from keras.optimizers import SGD
model.compile(loss = 'BinaryCrossentropy', optimizer='SGD',
              metrics=['accuracy'])
history = model.fit(x_train, y_train, batch_size=50, epochs=500,
                    verbose=1, validation_data=(x_test, y_test))
```

```
Epoch 1/500
10/10          1s 26ms/step -
accuracy: 0.7040 - loss: 0.6067 - val_accuracy: 0.7094 - val_loss: 0.6116
Epoch 2/500
10/10          0s 9ms/step -
accuracy: 0.7264 - loss: 0.5955 - val_accuracy: 0.7094 - val_loss: 0.6112
Epoch 3/500
10/10          0s 10ms/step -
accuracy: 0.7370 - loss: 0.5840 - val_accuracy: 0.7094 - val_loss: 0.6109
Epoch 4/500
10/10          0s 9ms/step -
accuracy: 0.6979 - loss: 0.6109 - val_accuracy: 0.7094 - val_loss: 0.6105
Epoch 5/500
10/10          0s 14ms/step -
accuracy: 0.7169 - loss: 0.6004 - val_accuracy: 0.7094 - val_loss: 0.6103
Epoch 6/500
10/10          0s 9ms/step -
accuracy: 0.7401 - loss: 0.5842 - val_accuracy: 0.7094 - val_loss: 0.6101
Epoch 7/500
10/10          0s 9ms/step -
accuracy: 0.7265 - loss: 0.5897 - val_accuracy: 0.7094 - val_loss: 0.6098
Epoch 8/500
10/10          0s 8ms/step -
accuracy: 0.7164 - loss: 0.5975 - val_accuracy: 0.7094 - val_loss: 0.6095
Epoch 9/500
10/10          0s 9ms/step -
accuracy: 0.7102 - loss: 0.6000 - val_accuracy: 0.7094 - val_loss: 0.6092
Epoch 10/500
10/10          0s 9ms/step -
accuracy: 0.7400 - loss: 0.5795 - val_accuracy: 0.7094 - val_loss: 0.6090
Epoch 11/500
10/10          0s 8ms/step -
accuracy: 0.6993 - loss: 0.6115 - val_accuracy: 0.7094 - val_loss: 0.6087
Epoch 12/500
10/10          0s 8ms/step -
accuracy: 0.7231 - loss: 0.5922 - val_accuracy: 0.7094 - val_loss: 0.6085
Epoch 13/500
10/10          0s 8ms/step -
accuracy: 0.7348 - loss: 0.5798 - val_accuracy: 0.7094 - val_loss: 0.6083
```

Epoch 14/500
 10/10 0s 9ms/step -
 accuracy: 0.7136 - loss: 0.5962 - val_accuracy: 0.7094 - val_loss: 0.6081
 Epoch 15/500
 10/10 0s 9ms/step -
 accuracy: 0.7350 - loss: 0.5884 - val_accuracy: 0.7094 - val_loss: 0.6078
 Epoch 16/500
 10/10 0s 8ms/step -
 accuracy: 0.7021 - loss: 0.6090 - val_accuracy: 0.7094 - val_loss: 0.6076
 Epoch 17/500
 10/10 0s 8ms/step -
 accuracy: 0.7168 - loss: 0.5936 - val_accuracy: 0.7094 - val_loss: 0.6074
 Epoch 18/500
 10/10 0s 17ms/step -
 accuracy: 0.6981 - loss: 0.6097 - val_accuracy: 0.7094 - val_loss: 0.6072
 Epoch 19/500
 10/10 0s 8ms/step -
 accuracy: 0.7000 - loss: 0.6111 - val_accuracy: 0.7094 - val_loss: 0.6071
 Epoch 20/500
 10/10 0s 9ms/step -
 accuracy: 0.7325 - loss: 0.5822 - val_accuracy: 0.7094 - val_loss: 0.6069
 Epoch 21/500
 10/10 0s 8ms/step -
 accuracy: 0.6995 - loss: 0.6114 - val_accuracy: 0.7094 - val_loss: 0.6068
 Epoch 22/500
 10/10 0s 8ms/step -
 accuracy: 0.6863 - loss: 0.6186 - val_accuracy: 0.7094 - val_loss: 0.6067
 Epoch 23/500
 10/10 0s 8ms/step -
 accuracy: 0.7284 - loss: 0.5877 - val_accuracy: 0.7094 - val_loss: 0.6065
 Epoch 24/500
 10/10 0s 9ms/step -
 accuracy: 0.7104 - loss: 0.6003 - val_accuracy: 0.7094 - val_loss: 0.6064
 Epoch 25/500
 10/10 0s 8ms/step -
 accuracy: 0.7283 - loss: 0.5833 - val_accuracy: 0.7094 - val_loss: 0.6062
 Epoch 26/500
 10/10 0s 8ms/step -
 accuracy: 0.7179 - loss: 0.5975 - val_accuracy: 0.7094 - val_loss: 0.6061
 Epoch 27/500
 10/10 0s 8ms/step -
 accuracy: 0.6782 - loss: 0.6304 - val_accuracy: 0.7094 - val_loss: 0.6060
 Epoch 28/500
 10/10 0s 8ms/step -
 accuracy: 0.7007 - loss: 0.6089 - val_accuracy: 0.7094 - val_loss: 0.6058
 Epoch 29/500
 10/10 0s 8ms/step -
 accuracy: 0.7344 - loss: 0.5778 - val_accuracy: 0.7094 - val_loss: 0.6057

Epoch 30/500
10/10 0s 8ms/step -
accuracy: 0.7198 - loss: 0.5919 - val_accuracy: 0.7094 - val_loss: 0.6056
Epoch 31/500
10/10 0s 8ms/step -
accuracy: 0.7245 - loss: 0.5912 - val_accuracy: 0.7094 - val_loss: 0.6055
Epoch 32/500
10/10 0s 7ms/step -
accuracy: 0.7083 - loss: 0.6041 - val_accuracy: 0.7094 - val_loss: 0.6054
Epoch 33/500
10/10 0s 8ms/step -
accuracy: 0.7050 - loss: 0.6057 - val_accuracy: 0.7094 - val_loss: 0.6053
Epoch 34/500
10/10 0s 7ms/step -
accuracy: 0.6962 - loss: 0.6103 - val_accuracy: 0.7094 - val_loss: 0.6051
Epoch 35/500
10/10 0s 8ms/step -
accuracy: 0.7208 - loss: 0.5862 - val_accuracy: 0.7094 - val_loss: 0.6050
Epoch 36/500
10/10 0s 8ms/step -
accuracy: 0.7287 - loss: 0.5833 - val_accuracy: 0.7094 - val_loss: 0.6049
Epoch 37/500
10/10 0s 8ms/step -
accuracy: 0.7167 - loss: 0.5930 - val_accuracy: 0.7094 - val_loss: 0.6048
Epoch 38/500
10/10 0s 9ms/step -
accuracy: 0.7150 - loss: 0.5995 - val_accuracy: 0.7094 - val_loss: 0.6047
Epoch 39/500
10/10 0s 8ms/step -
accuracy: 0.7336 - loss: 0.5836 - val_accuracy: 0.7094 - val_loss: 0.6046
Epoch 40/500
10/10 0s 8ms/step -
accuracy: 0.7103 - loss: 0.6010 - val_accuracy: 0.7094 - val_loss: 0.6045
Epoch 41/500
10/10 0s 8ms/step -
accuracy: 0.6949 - loss: 0.6146 - val_accuracy: 0.7094 - val_loss: 0.6044
Epoch 42/500
10/10 0s 7ms/step -
accuracy: 0.7156 - loss: 0.5934 - val_accuracy: 0.7094 - val_loss: 0.6043
Epoch 43/500
10/10 0s 8ms/step -
accuracy: 0.7294 - loss: 0.5862 - val_accuracy: 0.7094 - val_loss: 0.6042
Epoch 44/500
10/10 0s 8ms/step -
accuracy: 0.7017 - loss: 0.6059 - val_accuracy: 0.7094 - val_loss: 0.6041
Epoch 45/500
10/10 0s 8ms/step -
accuracy: 0.7132 - loss: 0.6001 - val_accuracy: 0.7094 - val_loss: 0.6040

Epoch 46/500
10/10 0s 9ms/step -
accuracy: 0.7287 - loss: 0.5857 - val_accuracy: 0.7094 - val_loss: 0.6039
Epoch 47/500
10/10 0s 9ms/step -
accuracy: 0.7316 - loss: 0.5787 - val_accuracy: 0.7094 - val_loss: 0.6038
Epoch 48/500
10/10 0s 10ms/step -
accuracy: 0.7280 - loss: 0.5815 - val_accuracy: 0.7094 - val_loss: 0.6037
Epoch 49/500
10/10 0s 8ms/step -
accuracy: 0.7254 - loss: 0.5867 - val_accuracy: 0.7094 - val_loss: 0.6035
Epoch 50/500
10/10 0s 8ms/step -
accuracy: 0.7292 - loss: 0.5845 - val_accuracy: 0.7094 - val_loss: 0.6034
Epoch 51/500
10/10 0s 8ms/step -
accuracy: 0.7329 - loss: 0.5798 - val_accuracy: 0.7094 - val_loss: 0.6034
Epoch 52/500
10/10 0s 8ms/step -
accuracy: 0.7212 - loss: 0.5910 - val_accuracy: 0.7094 - val_loss: 0.6033
Epoch 53/500
10/10 0s 10ms/step -
accuracy: 0.7092 - loss: 0.5994 - val_accuracy: 0.7094 - val_loss: 0.6031
Epoch 54/500
10/10 0s 8ms/step -
accuracy: 0.7251 - loss: 0.5866 - val_accuracy: 0.7094 - val_loss: 0.6030
Epoch 55/500
10/10 0s 12ms/step -
accuracy: 0.7249 - loss: 0.5865 - val_accuracy: 0.7094 - val_loss: 0.6030
Epoch 56/500
10/10 0s 9ms/step -
accuracy: 0.7385 - loss: 0.5781 - val_accuracy: 0.7094 - val_loss: 0.6029
Epoch 57/500
10/10 0s 8ms/step -
accuracy: 0.7004 - loss: 0.6082 - val_accuracy: 0.7094 - val_loss: 0.6028
Epoch 58/500
10/10 0s 8ms/step -
accuracy: 0.7145 - loss: 0.5905 - val_accuracy: 0.7094 - val_loss: 0.6027
Epoch 59/500
10/10 0s 10ms/step -
accuracy: 0.7020 - loss: 0.6091 - val_accuracy: 0.7094 - val_loss: 0.6026
Epoch 60/500
10/10 0s 8ms/step -
accuracy: 0.7264 - loss: 0.5869 - val_accuracy: 0.7094 - val_loss: 0.6025
Epoch 61/500
10/10 0s 9ms/step -
accuracy: 0.7313 - loss: 0.5793 - val_accuracy: 0.7094 - val_loss: 0.6024

Epoch 62/500
10/10 0s 9ms/step -
accuracy: 0.6952 - loss: 0.6077 - val_accuracy: 0.7094 - val_loss: 0.6023
Epoch 63/500
10/10 0s 8ms/step -
accuracy: 0.7138 - loss: 0.5916 - val_accuracy: 0.7094 - val_loss: 0.6022
Epoch 64/500
10/10 0s 8ms/step -
accuracy: 0.7404 - loss: 0.5701 - val_accuracy: 0.7094 - val_loss: 0.6021
Epoch 65/500
10/10 0s 8ms/step -
accuracy: 0.7084 - loss: 0.5988 - val_accuracy: 0.7094 - val_loss: 0.6020
Epoch 66/500
10/10 0s 8ms/step -
accuracy: 0.7114 - loss: 0.5995 - val_accuracy: 0.7094 - val_loss: 0.6019
Epoch 67/500
10/10 0s 8ms/step -
accuracy: 0.7116 - loss: 0.5981 - val_accuracy: 0.7094 - val_loss: 0.6019
Epoch 68/500
10/10 0s 8ms/step -
accuracy: 0.7256 - loss: 0.5814 - val_accuracy: 0.7094 - val_loss: 0.6018
Epoch 69/500
10/10 0s 8ms/step -
accuracy: 0.7131 - loss: 0.5994 - val_accuracy: 0.7094 - val_loss: 0.6017
Epoch 70/500
10/10 0s 15ms/step -
accuracy: 0.7168 - loss: 0.5957 - val_accuracy: 0.7094 - val_loss: 0.6016
Epoch 71/500
10/10 0s 10ms/step -
accuracy: 0.7058 - loss: 0.6026 - val_accuracy: 0.7094 - val_loss: 0.6015
Epoch 72/500
10/10 0s 7ms/step -
accuracy: 0.7072 - loss: 0.6002 - val_accuracy: 0.7094 - val_loss: 0.6014
Epoch 73/500
10/10 0s 8ms/step -
accuracy: 0.7068 - loss: 0.5992 - val_accuracy: 0.7094 - val_loss: 0.6013
Epoch 74/500
10/10 0s 8ms/step -
accuracy: 0.7274 - loss: 0.5832 - val_accuracy: 0.7094 - val_loss: 0.6012
Epoch 75/500
10/10 0s 12ms/step -
accuracy: 0.7059 - loss: 0.6015 - val_accuracy: 0.7094 - val_loss: 0.6011
Epoch 76/500
10/10 0s 8ms/step -
accuracy: 0.7027 - loss: 0.6016 - val_accuracy: 0.7094 - val_loss: 0.6011
Epoch 77/500
10/10 0s 9ms/step -
accuracy: 0.7169 - loss: 0.5928 - val_accuracy: 0.7094 - val_loss: 0.6010

Epoch 78/500
10/10 0s 8ms/step -
accuracy: 0.6939 - loss: 0.6127 - val_accuracy: 0.7094 - val_loss: 0.6009
Epoch 79/500
10/10 0s 9ms/step -
accuracy: 0.7138 - loss: 0.5910 - val_accuracy: 0.7094 - val_loss: 0.6008
Epoch 80/500
10/10 0s 9ms/step -
accuracy: 0.7171 - loss: 0.5921 - val_accuracy: 0.7094 - val_loss: 0.6007
Epoch 81/500
10/10 0s 8ms/step -
accuracy: 0.7245 - loss: 0.5815 - val_accuracy: 0.7094 - val_loss: 0.6006
Epoch 82/500
10/10 0s 8ms/step -
accuracy: 0.7075 - loss: 0.5976 - val_accuracy: 0.7094 - val_loss: 0.6005
Epoch 83/500
10/10 0s 9ms/step -
accuracy: 0.7191 - loss: 0.5911 - val_accuracy: 0.7094 - val_loss: 0.6005
Epoch 84/500
10/10 0s 8ms/step -
accuracy: 0.7400 - loss: 0.5714 - val_accuracy: 0.7094 - val_loss: 0.6004
Epoch 85/500
10/10 0s 8ms/step -
accuracy: 0.7111 - loss: 0.5964 - val_accuracy: 0.7094 - val_loss: 0.6003
Epoch 86/500
10/10 0s 8ms/step -
accuracy: 0.7177 - loss: 0.5905 - val_accuracy: 0.7094 - val_loss: 0.6002
Epoch 87/500
10/10 0s 8ms/step -
accuracy: 0.7183 - loss: 0.5908 - val_accuracy: 0.7094 - val_loss: 0.6001
Epoch 88/500
10/10 0s 9ms/step -
accuracy: 0.7118 - loss: 0.5945 - val_accuracy: 0.7094 - val_loss: 0.6000
Epoch 89/500
10/10 0s 8ms/step -
accuracy: 0.7278 - loss: 0.5809 - val_accuracy: 0.7094 - val_loss: 0.6000
Epoch 90/500
10/10 0s 8ms/step -
accuracy: 0.7314 - loss: 0.5754 - val_accuracy: 0.7094 - val_loss: 0.5999
Epoch 91/500
10/10 0s 12ms/step -
accuracy: 0.7178 - loss: 0.5907 - val_accuracy: 0.7094 - val_loss: 0.5998
Epoch 92/500
10/10 0s 9ms/step -
accuracy: 0.7269 - loss: 0.5831 - val_accuracy: 0.7094 - val_loss: 0.5997
Epoch 93/500
10/10 0s 8ms/step -
accuracy: 0.7161 - loss: 0.5910 - val_accuracy: 0.7094 - val_loss: 0.5996

Epoch 94/500
10/10 0s 8ms/step -
accuracy: 0.7149 - loss: 0.5936 - val_accuracy: 0.7094 - val_loss: 0.5995
Epoch 95/500
10/10 0s 8ms/step -
accuracy: 0.7362 - loss: 0.5729 - val_accuracy: 0.7094 - val_loss: 0.5995
Epoch 96/500
10/10 0s 8ms/step -
accuracy: 0.7469 - loss: 0.5643 - val_accuracy: 0.7094 - val_loss: 0.5994
Epoch 97/500
10/10 0s 8ms/step -
accuracy: 0.6895 - loss: 0.6124 - val_accuracy: 0.7094 - val_loss: 0.5993
Epoch 98/500
10/10 0s 8ms/step -
accuracy: 0.6905 - loss: 0.6094 - val_accuracy: 0.7094 - val_loss: 0.5992
Epoch 99/500
10/10 0s 10ms/step -
accuracy: 0.7014 - loss: 0.6038 - val_accuracy: 0.7094 - val_loss: 0.5992
Epoch 100/500
10/10 0s 14ms/step -
accuracy: 0.7146 - loss: 0.5905 - val_accuracy: 0.7094 - val_loss: 0.5991
Epoch 101/500
10/10 0s 8ms/step -
accuracy: 0.7185 - loss: 0.5882 - val_accuracy: 0.7094 - val_loss: 0.5990
Epoch 102/500
10/10 0s 8ms/step -
accuracy: 0.7157 - loss: 0.5876 - val_accuracy: 0.7094 - val_loss: 0.5989
Epoch 103/500
10/10 0s 8ms/step -
accuracy: 0.7195 - loss: 0.5852 - val_accuracy: 0.7094 - val_loss: 0.5988
Epoch 104/500
10/10 0s 8ms/step -
accuracy: 0.7039 - loss: 0.5980 - val_accuracy: 0.7094 - val_loss: 0.5987
Epoch 105/500
10/10 0s 12ms/step -
accuracy: 0.7171 - loss: 0.5886 - val_accuracy: 0.7094 - val_loss: 0.5987
Epoch 106/500
10/10 0s 8ms/step -
accuracy: 0.7061 - loss: 0.5966 - val_accuracy: 0.7094 - val_loss: 0.5986
Epoch 107/500
10/10 0s 8ms/step -
accuracy: 0.7189 - loss: 0.5852 - val_accuracy: 0.7094 - val_loss: 0.5985
Epoch 108/500
10/10 0s 8ms/step -
accuracy: 0.7065 - loss: 0.5947 - val_accuracy: 0.7094 - val_loss: 0.5984
Epoch 109/500
10/10 0s 8ms/step -
accuracy: 0.7254 - loss: 0.5773 - val_accuracy: 0.7094 - val_loss: 0.5983

Epoch 110/500
10/10 0s 8ms/step -
accuracy: 0.6971 - loss: 0.6062 - val_accuracy: 0.7094 - val_loss: 0.5983
Epoch 111/500
10/10 0s 8ms/step -
accuracy: 0.7320 - loss: 0.5771 - val_accuracy: 0.7094 - val_loss: 0.5982
Epoch 112/500
10/10 0s 8ms/step -
accuracy: 0.7310 - loss: 0.5770 - val_accuracy: 0.7094 - val_loss: 0.5981
Epoch 113/500
10/10 0s 7ms/step -
accuracy: 0.7343 - loss: 0.5757 - val_accuracy: 0.7094 - val_loss: 0.5980
Epoch 114/500
10/10 0s 7ms/step -
accuracy: 0.7043 - loss: 0.5991 - val_accuracy: 0.7094 - val_loss: 0.5979
Epoch 115/500
10/10 0s 8ms/step -
accuracy: 0.7099 - loss: 0.5905 - val_accuracy: 0.7094 - val_loss: 0.5979
Epoch 116/500
10/10 0s 8ms/step -
accuracy: 0.7099 - loss: 0.5931 - val_accuracy: 0.7094 - val_loss: 0.5978
Epoch 117/500
10/10 0s 11ms/step -
accuracy: 0.7146 - loss: 0.5866 - val_accuracy: 0.7094 - val_loss: 0.5977
Epoch 118/500
10/10 0s 9ms/step -
accuracy: 0.7410 - loss: 0.5677 - val_accuracy: 0.7094 - val_loss: 0.5976
Epoch 119/500
10/10 0s 7ms/step -
accuracy: 0.7268 - loss: 0.5817 - val_accuracy: 0.7094 - val_loss: 0.5975
Epoch 120/500
10/10 0s 7ms/step -
accuracy: 0.7127 - loss: 0.5928 - val_accuracy: 0.7094 - val_loss: 0.5975
Epoch 121/500
10/10 0s 7ms/step -
accuracy: 0.7136 - loss: 0.5927 - val_accuracy: 0.7094 - val_loss: 0.5974
Epoch 122/500
10/10 0s 12ms/step -
accuracy: 0.7159 - loss: 0.5910 - val_accuracy: 0.7094 - val_loss: 0.5973
Epoch 123/500
10/10 0s 7ms/step -
accuracy: 0.7086 - loss: 0.5973 - val_accuracy: 0.7094 - val_loss: 0.5972
Epoch 124/500
10/10 0s 7ms/step -
accuracy: 0.7304 - loss: 0.5715 - val_accuracy: 0.7094 - val_loss: 0.5972
Epoch 125/500
10/10 0s 7ms/step -
accuracy: 0.7228 - loss: 0.5812 - val_accuracy: 0.7094 - val_loss: 0.5971

Epoch 126/500
10/10 0s 7ms/step -
accuracy: 0.7107 - loss: 0.5911 - val_accuracy: 0.7094 - val_loss: 0.5970
Epoch 127/500
10/10 0s 7ms/step -
accuracy: 0.6887 - loss: 0.6116 - val_accuracy: 0.7094 - val_loss: 0.5969
Epoch 128/500
10/10 0s 7ms/step -
accuracy: 0.7244 - loss: 0.5786 - val_accuracy: 0.7094 - val_loss: 0.5969
Epoch 129/500
10/10 0s 7ms/step -
accuracy: 0.7031 - loss: 0.6014 - val_accuracy: 0.7094 - val_loss: 0.5968
Epoch 130/500
10/10 0s 7ms/step -
accuracy: 0.7049 - loss: 0.5968 - val_accuracy: 0.7094 - val_loss: 0.5967
Epoch 131/500
10/10 0s 8ms/step -
accuracy: 0.7079 - loss: 0.5932 - val_accuracy: 0.7094 - val_loss: 0.5966
Epoch 132/500
10/10 0s 8ms/step -
accuracy: 0.7060 - loss: 0.5961 - val_accuracy: 0.7094 - val_loss: 0.5965
Epoch 133/500
10/10 0s 7ms/step -
accuracy: 0.6961 - loss: 0.6041 - val_accuracy: 0.7094 - val_loss: 0.5965
Epoch 134/500
10/10 0s 7ms/step -
accuracy: 0.7009 - loss: 0.6039 - val_accuracy: 0.7094 - val_loss: 0.5964
Epoch 135/500
10/10 0s 7ms/step -
accuracy: 0.7144 - loss: 0.5877 - val_accuracy: 0.7094 - val_loss: 0.5963
Epoch 136/500
10/10 0s 8ms/step -
accuracy: 0.7135 - loss: 0.5906 - val_accuracy: 0.7094 - val_loss: 0.5962
Epoch 137/500
10/10 0s 7ms/step -
accuracy: 0.7312 - loss: 0.5760 - val_accuracy: 0.7094 - val_loss: 0.5962
Epoch 138/500
10/10 0s 7ms/step -
accuracy: 0.7370 - loss: 0.5659 - val_accuracy: 0.7094 - val_loss: 0.5961
Epoch 139/500
10/10 0s 7ms/step -
accuracy: 0.7191 - loss: 0.5873 - val_accuracy: 0.7094 - val_loss: 0.5960
Epoch 140/500
10/10 0s 8ms/step -
accuracy: 0.7145 - loss: 0.5869 - val_accuracy: 0.7094 - val_loss: 0.5959
Epoch 141/500
10/10 0s 8ms/step -
accuracy: 0.7151 - loss: 0.5875 - val_accuracy: 0.7094 - val_loss: 0.5959

Epoch 142/500
10/10 0s 8ms/step -
accuracy: 0.7288 - loss: 0.5734 - val_accuracy: 0.7094 - val_loss: 0.5958

Epoch 143/500
10/10 0s 7ms/step -
accuracy: 0.7245 - loss: 0.5771 - val_accuracy: 0.7094 - val_loss: 0.5957

Epoch 144/500
10/10 0s 8ms/step -
accuracy: 0.6964 - loss: 0.6079 - val_accuracy: 0.7094 - val_loss: 0.5956

Epoch 145/500
10/10 0s 8ms/step -
accuracy: 0.7121 - loss: 0.5921 - val_accuracy: 0.7094 - val_loss: 0.5955

Epoch 146/500
10/10 0s 8ms/step -
accuracy: 0.7430 - loss: 0.5606 - val_accuracy: 0.7094 - val_loss: 0.5955

Epoch 147/500
10/10 0s 12ms/step -
accuracy: 0.7091 - loss: 0.5910 - val_accuracy: 0.7094 - val_loss: 0.5954

Epoch 148/500
10/10 0s 8ms/step -
accuracy: 0.7211 - loss: 0.5801 - val_accuracy: 0.7094 - val_loss: 0.5953

Epoch 149/500
10/10 0s 12ms/step -
accuracy: 0.7438 - loss: 0.5628 - val_accuracy: 0.7094 - val_loss: 0.5952

Epoch 150/500
10/10 0s 8ms/step -
accuracy: 0.7270 - loss: 0.5757 - val_accuracy: 0.7094 - val_loss: 0.5952

Epoch 151/500
10/10 0s 7ms/step -
accuracy: 0.6880 - loss: 0.6092 - val_accuracy: 0.7094 - val_loss: 0.5951

Epoch 152/500
10/10 0s 9ms/step -
accuracy: 0.7004 - loss: 0.5957 - val_accuracy: 0.7094 - val_loss: 0.5950

Epoch 153/500
10/10 0s 8ms/step -
accuracy: 0.7386 - loss: 0.5677 - val_accuracy: 0.7094 - val_loss: 0.5950

Epoch 154/500
10/10 0s 8ms/step -
accuracy: 0.7038 - loss: 0.5943 - val_accuracy: 0.7094 - val_loss: 0.5949

Epoch 155/500
10/10 0s 9ms/step -
accuracy: 0.7121 - loss: 0.5852 - val_accuracy: 0.7094 - val_loss: 0.5948

Epoch 156/500
10/10 0s 8ms/step -
accuracy: 0.7342 - loss: 0.5685 - val_accuracy: 0.7094 - val_loss: 0.5947

Epoch 157/500
10/10 0s 8ms/step -
accuracy: 0.6999 - loss: 0.6002 - val_accuracy: 0.7094 - val_loss: 0.5947

Epoch 158/500
10/10 0s 11ms/step -
accuracy: 0.7012 - loss: 0.5963 - val_accuracy: 0.7094 - val_loss: 0.5946

Epoch 159/500
10/10 0s 8ms/step -
accuracy: 0.7161 - loss: 0.5857 - val_accuracy: 0.7094 - val_loss: 0.5945

Epoch 160/500
10/10 0s 8ms/step -
accuracy: 0.6804 - loss: 0.6141 - val_accuracy: 0.7094 - val_loss: 0.5944

Epoch 161/500
10/10 0s 8ms/step -
accuracy: 0.7225 - loss: 0.5793 - val_accuracy: 0.7094 - val_loss: 0.5944

Epoch 162/500
10/10 0s 9ms/step -
accuracy: 0.7108 - loss: 0.5888 - val_accuracy: 0.7094 - val_loss: 0.5943

Epoch 163/500
10/10 0s 8ms/step -
accuracy: 0.7167 - loss: 0.5893 - val_accuracy: 0.7094 - val_loss: 0.5942

Epoch 164/500
10/10 0s 8ms/step -
accuracy: 0.7203 - loss: 0.5829 - val_accuracy: 0.7094 - val_loss: 0.5942

Epoch 165/500
10/10 0s 8ms/step -
accuracy: 0.7210 - loss: 0.5807 - val_accuracy: 0.7094 - val_loss: 0.5941

Epoch 166/500
10/10 0s 8ms/step -
accuracy: 0.7355 - loss: 0.5683 - val_accuracy: 0.7094 - val_loss: 0.5940

Epoch 167/500
10/10 0s 12ms/step -
accuracy: 0.7097 - loss: 0.5880 - val_accuracy: 0.7094 - val_loss: 0.5939

Epoch 168/500
10/10 0s 7ms/step -
accuracy: 0.7215 - loss: 0.5800 - val_accuracy: 0.7094 - val_loss: 0.5939

Epoch 169/500
10/10 0s 8ms/step -
accuracy: 0.7386 - loss: 0.5691 - val_accuracy: 0.7094 - val_loss: 0.5938

Epoch 170/500
10/10 0s 13ms/step -
accuracy: 0.7088 - loss: 0.5898 - val_accuracy: 0.7094 - val_loss: 0.5937

Epoch 171/500
10/10 0s 9ms/step -
accuracy: 0.6916 - loss: 0.6029 - val_accuracy: 0.7094 - val_loss: 0.5937

Epoch 172/500
10/10 0s 7ms/step -
accuracy: 0.7046 - loss: 0.5895 - val_accuracy: 0.7094 - val_loss: 0.5936

Epoch 173/500
10/10 0s 8ms/step -
accuracy: 0.7179 - loss: 0.5819 - val_accuracy: 0.7094 - val_loss: 0.5935

Epoch 174/500
10/10 0s 8ms/step -
accuracy: 0.7235 - loss: 0.5790 - val_accuracy: 0.7094 - val_loss: 0.5934
Epoch 175/500
10/10 0s 8ms/step -
accuracy: 0.7115 - loss: 0.5887 - val_accuracy: 0.7094 - val_loss: 0.5934
Epoch 176/500
10/10 0s 11ms/step -
accuracy: 0.7299 - loss: 0.5771 - val_accuracy: 0.7094 - val_loss: 0.5933
Epoch 177/500
10/10 0s 8ms/step -
accuracy: 0.7320 - loss: 0.5758 - val_accuracy: 0.7094 - val_loss: 0.5932
Epoch 178/500
10/10 0s 8ms/step -
accuracy: 0.7244 - loss: 0.5766 - val_accuracy: 0.7094 - val_loss: 0.5932
Epoch 179/500
10/10 0s 9ms/step -
accuracy: 0.7430 - loss: 0.5618 - val_accuracy: 0.7094 - val_loss: 0.5931
Epoch 180/500
10/10 0s 8ms/step -
accuracy: 0.7140 - loss: 0.5829 - val_accuracy: 0.7094 - val_loss: 0.5930
Epoch 181/500
10/10 0s 8ms/step -
accuracy: 0.6951 - loss: 0.6001 - val_accuracy: 0.7094 - val_loss: 0.5930
Epoch 182/500
10/10 0s 8ms/step -
accuracy: 0.7108 - loss: 0.5861 - val_accuracy: 0.7094 - val_loss: 0.5929
Epoch 183/500
10/10 0s 8ms/step -
accuracy: 0.7097 - loss: 0.5907 - val_accuracy: 0.7094 - val_loss: 0.5928
Epoch 184/500
10/10 0s 12ms/step -
accuracy: 0.7172 - loss: 0.5884 - val_accuracy: 0.7094 - val_loss: 0.5928
Epoch 185/500
10/10 0s 8ms/step -
accuracy: 0.7076 - loss: 0.5891 - val_accuracy: 0.7094 - val_loss: 0.5927
Epoch 186/500
10/10 0s 8ms/step -
accuracy: 0.7049 - loss: 0.5922 - val_accuracy: 0.7094 - val_loss: 0.5926
Epoch 187/500
10/10 0s 9ms/step -
accuracy: 0.7181 - loss: 0.5845 - val_accuracy: 0.7094 - val_loss: 0.5925
Epoch 188/500
10/10 0s 8ms/step -
accuracy: 0.7239 - loss: 0.5774 - val_accuracy: 0.7094 - val_loss: 0.5925
Epoch 189/500
10/10 0s 9ms/step -
accuracy: 0.7180 - loss: 0.5813 - val_accuracy: 0.7094 - val_loss: 0.5924

Epoch 190/500
10/10 0s 9ms/step -
accuracy: 0.7257 - loss: 0.5731 - val_accuracy: 0.7094 - val_loss: 0.5923
Epoch 191/500
10/10 0s 8ms/step -
accuracy: 0.7291 - loss: 0.5732 - val_accuracy: 0.7094 - val_loss: 0.5923
Epoch 192/500
10/10 0s 11ms/step -
accuracy: 0.7158 - loss: 0.5848 - val_accuracy: 0.7094 - val_loss: 0.5922
Epoch 193/500
10/10 0s 8ms/step -
accuracy: 0.7347 - loss: 0.5623 - val_accuracy: 0.7094 - val_loss: 0.5921
Epoch 194/500
10/10 0s 8ms/step -
accuracy: 0.7290 - loss: 0.5764 - val_accuracy: 0.7094 - val_loss: 0.5921
Epoch 195/500
10/10 0s 8ms/step -
accuracy: 0.7193 - loss: 0.5773 - val_accuracy: 0.7094 - val_loss: 0.5920
Epoch 196/500
10/10 0s 13ms/step -
accuracy: 0.7174 - loss: 0.5817 - val_accuracy: 0.7094 - val_loss: 0.5919
Epoch 197/500
10/10 0s 8ms/step -
accuracy: 0.7079 - loss: 0.5887 - val_accuracy: 0.7094 - val_loss: 0.5919
Epoch 198/500
10/10 0s 8ms/step -
accuracy: 0.7313 - loss: 0.5687 - val_accuracy: 0.7094 - val_loss: 0.5918
Epoch 199/500
10/10 0s 8ms/step -
accuracy: 0.7327 - loss: 0.5675 - val_accuracy: 0.7094 - val_loss: 0.5917
Epoch 200/500
10/10 0s 11ms/step -
accuracy: 0.7191 - loss: 0.5753 - val_accuracy: 0.7094 - val_loss: 0.5916
Epoch 201/500
10/10 0s 12ms/step -
accuracy: 0.7212 - loss: 0.5779 - val_accuracy: 0.7094 - val_loss: 0.5916
Epoch 202/500
10/10 0s 8ms/step -
accuracy: 0.7033 - loss: 0.5899 - val_accuracy: 0.7094 - val_loss: 0.5915
Epoch 203/500
10/10 0s 8ms/step -
accuracy: 0.7240 - loss: 0.5734 - val_accuracy: 0.7094 - val_loss: 0.5914
Epoch 204/500
10/10 0s 8ms/step -
accuracy: 0.7044 - loss: 0.5945 - val_accuracy: 0.7094 - val_loss: 0.5914
Epoch 205/500
10/10 0s 8ms/step -
accuracy: 0.7450 - loss: 0.5568 - val_accuracy: 0.7094 - val_loss: 0.5913

Epoch 206/500
10/10 0s 8ms/step -
accuracy: 0.6951 - loss: 0.6009 - val_accuracy: 0.7094 - val_loss: 0.5912

Epoch 207/500
10/10 0s 9ms/step -
accuracy: 0.7134 - loss: 0.5857 - val_accuracy: 0.7094 - val_loss: 0.5912

Epoch 208/500
10/10 0s 17ms/step -
accuracy: 0.7257 - loss: 0.5746 - val_accuracy: 0.7094 - val_loss: 0.5911

Epoch 209/500
10/10 0s 8ms/step -
accuracy: 0.6940 - loss: 0.5993 - val_accuracy: 0.7094 - val_loss: 0.5910

Epoch 210/500
10/10 0s 9ms/step -
accuracy: 0.7095 - loss: 0.5855 - val_accuracy: 0.7094 - val_loss: 0.5910

Epoch 211/500
10/10 0s 8ms/step -
accuracy: 0.7098 - loss: 0.5892 - val_accuracy: 0.7094 - val_loss: 0.5909

Epoch 212/500
10/10 0s 8ms/step -
accuracy: 0.7300 - loss: 0.5680 - val_accuracy: 0.7094 - val_loss: 0.5908

Epoch 213/500
10/10 0s 8ms/step -
accuracy: 0.7127 - loss: 0.5823 - val_accuracy: 0.7094 - val_loss: 0.5908

Epoch 214/500
10/10 0s 9ms/step -
accuracy: 0.7347 - loss: 0.5661 - val_accuracy: 0.7094 - val_loss: 0.5907

Epoch 215/500
10/10 0s 13ms/step -
accuracy: 0.6962 - loss: 0.5944 - val_accuracy: 0.7094 - val_loss: 0.5907

Epoch 216/500
10/10 0s 8ms/step -
accuracy: 0.7255 - loss: 0.5764 - val_accuracy: 0.7094 - val_loss: 0.5906

Epoch 217/500
10/10 0s 8ms/step -
accuracy: 0.7259 - loss: 0.5727 - val_accuracy: 0.7094 - val_loss: 0.5905

Epoch 218/500
10/10 0s 8ms/step -
accuracy: 0.7249 - loss: 0.5740 - val_accuracy: 0.7094 - val_loss: 0.5905

Epoch 219/500
10/10 0s 10ms/step -
accuracy: 0.7261 - loss: 0.5727 - val_accuracy: 0.7094 - val_loss: 0.5904

Epoch 220/500
10/10 0s 10ms/step -
accuracy: 0.6929 - loss: 0.6014 - val_accuracy: 0.7094 - val_loss: 0.5903

Epoch 221/500
10/10 0s 9ms/step -
accuracy: 0.6960 - loss: 0.6020 - val_accuracy: 0.7094 - val_loss: 0.5903

Epoch 222/500
10/10 0s 11ms/step -
accuracy: 0.7188 - loss: 0.5759 - val_accuracy: 0.7094 - val_loss: 0.5902
Epoch 223/500
10/10 0s 8ms/step -
accuracy: 0.7296 - loss: 0.5678 - val_accuracy: 0.7094 - val_loss: 0.5901
Epoch 224/500
10/10 0s 9ms/step -
accuracy: 0.7445 - loss: 0.5584 - val_accuracy: 0.7094 - val_loss: 0.5901
Epoch 225/500
10/10 0s 8ms/step -
accuracy: 0.7119 - loss: 0.5808 - val_accuracy: 0.7094 - val_loss: 0.5900
Epoch 226/500
10/10 0s 10ms/step -
accuracy: 0.7087 - loss: 0.5876 - val_accuracy: 0.7094 - val_loss: 0.5899
Epoch 227/500
10/10 0s 8ms/step -
accuracy: 0.7214 - loss: 0.5802 - val_accuracy: 0.7094 - val_loss: 0.5899
Epoch 228/500
10/10 0s 11ms/step -
accuracy: 0.7010 - loss: 0.5939 - val_accuracy: 0.7094 - val_loss: 0.5898
Epoch 229/500
10/10 0s 10ms/step -
accuracy: 0.7270 - loss: 0.5727 - val_accuracy: 0.7094 - val_loss: 0.5897
Epoch 230/500
10/10 0s 8ms/step -
accuracy: 0.7156 - loss: 0.5842 - val_accuracy: 0.7094 - val_loss: 0.5897
Epoch 231/500
10/10 0s 10ms/step -
accuracy: 0.7305 - loss: 0.5670 - val_accuracy: 0.7094 - val_loss: 0.5896
Epoch 232/500
10/10 0s 9ms/step -
accuracy: 0.7220 - loss: 0.5781 - val_accuracy: 0.7094 - val_loss: 0.5896
Epoch 233/500
10/10 0s 13ms/step -
accuracy: 0.7063 - loss: 0.5916 - val_accuracy: 0.7094 - val_loss: 0.5895
Epoch 234/500
10/10 0s 12ms/step -
accuracy: 0.6963 - loss: 0.5928 - val_accuracy: 0.7094 - val_loss: 0.5894
Epoch 235/500
10/10 0s 14ms/step -
accuracy: 0.7092 - loss: 0.5874 - val_accuracy: 0.7094 - val_loss: 0.5894
Epoch 236/500
10/10 0s 9ms/step -
accuracy: 0.7034 - loss: 0.5907 - val_accuracy: 0.7094 - val_loss: 0.5893
Epoch 237/500
10/10 0s 8ms/step -
accuracy: 0.7118 - loss: 0.5873 - val_accuracy: 0.7094 - val_loss: 0.5892

Epoch 238/500
10/10 0s 8ms/step -
accuracy: 0.6979 - loss: 0.5941 - val_accuracy: 0.7094 - val_loss: 0.5892

Epoch 239/500
10/10 0s 8ms/step -
accuracy: 0.7205 - loss: 0.5713 - val_accuracy: 0.7094 - val_loss: 0.5891

Epoch 240/500
10/10 0s 8ms/step -
accuracy: 0.6883 - loss: 0.6056 - val_accuracy: 0.7094 - val_loss: 0.5891

Epoch 241/500
10/10 0s 8ms/step -
accuracy: 0.7151 - loss: 0.5795 - val_accuracy: 0.7094 - val_loss: 0.5890

Epoch 242/500
10/10 0s 12ms/step -
accuracy: 0.7110 - loss: 0.5832 - val_accuracy: 0.7094 - val_loss: 0.5889

Epoch 243/500
10/10 0s 8ms/step -
accuracy: 0.6983 - loss: 0.5950 - val_accuracy: 0.7094 - val_loss: 0.5889

Epoch 244/500
10/10 0s 12ms/step -
accuracy: 0.7248 - loss: 0.5760 - val_accuracy: 0.7094 - val_loss: 0.5888

Epoch 245/500
10/10 0s 7ms/step -
accuracy: 0.7052 - loss: 0.5918 - val_accuracy: 0.7094 - val_loss: 0.5888

Epoch 246/500
10/10 0s 9ms/step -
accuracy: 0.7260 - loss: 0.5729 - val_accuracy: 0.7094 - val_loss: 0.5887

Epoch 247/500
10/10 0s 9ms/step -
accuracy: 0.6963 - loss: 0.5970 - val_accuracy: 0.7094 - val_loss: 0.5886

Epoch 248/500
10/10 0s 9ms/step -
accuracy: 0.7156 - loss: 0.5806 - val_accuracy: 0.7094 - val_loss: 0.5886

Epoch 249/500
10/10 0s 14ms/step -
accuracy: 0.6948 - loss: 0.5988 - val_accuracy: 0.7094 - val_loss: 0.5885

Epoch 250/500
10/10 0s 8ms/step -
accuracy: 0.7427 - loss: 0.5549 - val_accuracy: 0.7094 - val_loss: 0.5885

Epoch 251/500
10/10 0s 8ms/step -
accuracy: 0.7239 - loss: 0.5745 - val_accuracy: 0.7094 - val_loss: 0.5884

Epoch 252/500
10/10 0s 11ms/step -
accuracy: 0.7221 - loss: 0.5749 - val_accuracy: 0.7094 - val_loss: 0.5883

Epoch 253/500
10/10 0s 8ms/step -
accuracy: 0.6893 - loss: 0.6068 - val_accuracy: 0.7094 - val_loss: 0.5883

Epoch 254/500
10/10 0s 9ms/step -
accuracy: 0.7033 - loss: 0.5885 - val_accuracy: 0.7094 - val_loss: 0.5882

Epoch 255/500
10/10 0s 8ms/step -
accuracy: 0.7287 - loss: 0.5726 - val_accuracy: 0.7094 - val_loss: 0.5882

Epoch 256/500
10/10 0s 11ms/step -
accuracy: 0.7311 - loss: 0.5644 - val_accuracy: 0.7094 - val_loss: 0.5881

Epoch 257/500
10/10 0s 8ms/step -
accuracy: 0.7209 - loss: 0.5731 - val_accuracy: 0.7094 - val_loss: 0.5880

Epoch 258/500
10/10 0s 9ms/step -
accuracy: 0.7063 - loss: 0.5878 - val_accuracy: 0.7094 - val_loss: 0.5880

Epoch 259/500
10/10 0s 8ms/step -
accuracy: 0.7372 - loss: 0.5581 - val_accuracy: 0.7094 - val_loss: 0.5879

Epoch 260/500
10/10 0s 8ms/step -
accuracy: 0.7181 - loss: 0.5726 - val_accuracy: 0.7094 - val_loss: 0.5878

Epoch 261/500
10/10 0s 8ms/step -
accuracy: 0.7075 - loss: 0.5830 - val_accuracy: 0.7094 - val_loss: 0.5878

Epoch 262/500
10/10 0s 16ms/step -
accuracy: 0.7002 - loss: 0.5930 - val_accuracy: 0.7094 - val_loss: 0.5877

Epoch 263/500
10/10 0s 8ms/step -
accuracy: 0.7379 - loss: 0.5558 - val_accuracy: 0.7094 - val_loss: 0.5877

Epoch 264/500
10/10 0s 9ms/step -
accuracy: 0.7188 - loss: 0.5746 - val_accuracy: 0.7094 - val_loss: 0.5876

Epoch 265/500
10/10 0s 8ms/step -
accuracy: 0.7030 - loss: 0.5899 - val_accuracy: 0.7094 - val_loss: 0.5875

Epoch 266/500
10/10 0s 9ms/step -
accuracy: 0.7174 - loss: 0.5775 - val_accuracy: 0.7094 - val_loss: 0.5875

Epoch 267/500
10/10 0s 8ms/step -
accuracy: 0.6990 - loss: 0.5920 - val_accuracy: 0.7094 - val_loss: 0.5874

Epoch 268/500
10/10 0s 17ms/step -
accuracy: 0.7200 - loss: 0.5786 - val_accuracy: 0.7094 - val_loss: 0.5874

Epoch 269/500
10/10 0s 7ms/step -
accuracy: 0.7087 - loss: 0.5869 - val_accuracy: 0.7094 - val_loss: 0.5873

Epoch 270/500
10/10 0s 9ms/step -
accuracy: 0.7124 - loss: 0.5765 - val_accuracy: 0.7094 - val_loss: 0.5872

Epoch 271/500
10/10 0s 8ms/step -
accuracy: 0.6835 - loss: 0.6095 - val_accuracy: 0.7094 - val_loss: 0.5872

Epoch 272/500
10/10 0s 8ms/step -
accuracy: 0.7082 - loss: 0.5860 - val_accuracy: 0.7094 - val_loss: 0.5871

Epoch 273/500
10/10 0s 9ms/step -
accuracy: 0.7427 - loss: 0.5564 - val_accuracy: 0.7094 - val_loss: 0.5871

Epoch 274/500
10/10 0s 8ms/step -
accuracy: 0.7060 - loss: 0.5888 - val_accuracy: 0.7094 - val_loss: 0.5870

Epoch 275/500
10/10 0s 13ms/step -
accuracy: 0.7004 - loss: 0.5864 - val_accuracy: 0.7094 - val_loss: 0.5869

Epoch 276/500
10/10 0s 7ms/step -
accuracy: 0.7248 - loss: 0.5713 - val_accuracy: 0.7094 - val_loss: 0.5869

Epoch 277/500
10/10 0s 9ms/step -
accuracy: 0.6947 - loss: 0.5964 - val_accuracy: 0.7094 - val_loss: 0.5868

Epoch 278/500
10/10 0s 11ms/step -
accuracy: 0.6954 - loss: 0.6008 - val_accuracy: 0.7094 - val_loss: 0.5868

Epoch 279/500
10/10 0s 8ms/step -
accuracy: 0.7122 - loss: 0.5813 - val_accuracy: 0.7094 - val_loss: 0.5867

Epoch 280/500
10/10 0s 8ms/step -
accuracy: 0.7185 - loss: 0.5768 - val_accuracy: 0.7094 - val_loss: 0.5867

Epoch 281/500
10/10 0s 7ms/step -
accuracy: 0.7143 - loss: 0.5802 - val_accuracy: 0.7094 - val_loss: 0.5866

Epoch 282/500
10/10 0s 8ms/step -
accuracy: 0.7246 - loss: 0.5693 - val_accuracy: 0.7094 - val_loss: 0.5865

Epoch 283/500
10/10 0s 8ms/step -
accuracy: 0.7434 - loss: 0.5533 - val_accuracy: 0.7094 - val_loss: 0.5865

Epoch 284/500
10/10 0s 12ms/step -
accuracy: 0.7092 - loss: 0.5834 - val_accuracy: 0.7094 - val_loss: 0.5864

Epoch 285/500
10/10 0s 8ms/step -
accuracy: 0.7416 - loss: 0.5613 - val_accuracy: 0.7094 - val_loss: 0.5864

Epoch 286/500
10/10 0s 8ms/step -
accuracy: 0.7008 - loss: 0.5893 - val_accuracy: 0.7094 - val_loss: 0.5863

Epoch 287/500
10/10 0s 8ms/step -
accuracy: 0.7314 - loss: 0.5636 - val_accuracy: 0.7094 - val_loss: 0.5863

Epoch 288/500
10/10 0s 8ms/step -
accuracy: 0.7291 - loss: 0.5658 - val_accuracy: 0.7094 - val_loss: 0.5862

Epoch 289/500
10/10 0s 10ms/step -
accuracy: 0.7141 - loss: 0.5769 - val_accuracy: 0.7094 - val_loss: 0.5861

Epoch 290/500
10/10 0s 8ms/step -
accuracy: 0.7052 - loss: 0.5871 - val_accuracy: 0.7094 - val_loss: 0.5861

Epoch 291/500
10/10 0s 8ms/step -
accuracy: 0.7174 - loss: 0.5722 - val_accuracy: 0.7094 - val_loss: 0.5860

Epoch 292/500
10/10 0s 8ms/step -
accuracy: 0.7161 - loss: 0.5753 - val_accuracy: 0.7094 - val_loss: 0.5860

Epoch 293/500
10/10 0s 8ms/step -
accuracy: 0.7141 - loss: 0.5740 - val_accuracy: 0.7094 - val_loss: 0.5859

Epoch 294/500
10/10 0s 13ms/step -
accuracy: 0.7302 - loss: 0.5658 - val_accuracy: 0.7094 - val_loss: 0.5858

Epoch 295/500
10/10 0s 9ms/step -
accuracy: 0.6975 - loss: 0.5935 - val_accuracy: 0.7094 - val_loss: 0.5858

Epoch 296/500
10/10 0s 9ms/step -
accuracy: 0.7136 - loss: 0.5767 - val_accuracy: 0.7094 - val_loss: 0.5857

Epoch 297/500
10/10 0s 9ms/step -
accuracy: 0.7405 - loss: 0.5599 - val_accuracy: 0.7094 - val_loss: 0.5857

Epoch 298/500
10/10 0s 9ms/step -
accuracy: 0.7082 - loss: 0.5845 - val_accuracy: 0.7094 - val_loss: 0.5856

Epoch 299/500
10/10 0s 18ms/step -
accuracy: 0.7272 - loss: 0.5719 - val_accuracy: 0.7094 - val_loss: 0.5856

Epoch 300/500
10/10 0s 9ms/step -
accuracy: 0.6836 - loss: 0.6019 - val_accuracy: 0.7094 - val_loss: 0.5855

Epoch 301/500
10/10 0s 9ms/step -
accuracy: 0.7181 - loss: 0.5714 - val_accuracy: 0.7094 - val_loss: 0.5855

Epoch 302/500
10/10 0s 9ms/step -
accuracy: 0.7309 - loss: 0.5583 - val_accuracy: 0.7094 - val_loss: 0.5854
Epoch 303/500
10/10 0s 9ms/step -
accuracy: 0.7275 - loss: 0.5685 - val_accuracy: 0.7094 - val_loss: 0.5853
Epoch 304/500
10/10 0s 12ms/step -
accuracy: 0.7135 - loss: 0.5813 - val_accuracy: 0.7094 - val_loss: 0.5853
Epoch 305/500
10/10 0s 16ms/step -
accuracy: 0.7099 - loss: 0.5829 - val_accuracy: 0.7094 - val_loss: 0.5852
Epoch 306/500
10/10 0s 10ms/step -
accuracy: 0.7132 - loss: 0.5793 - val_accuracy: 0.7094 - val_loss: 0.5852
Epoch 307/500
10/10 0s 9ms/step -
accuracy: 0.7127 - loss: 0.5782 - val_accuracy: 0.7094 - val_loss: 0.5851
Epoch 308/500
10/10 0s 10ms/step -
accuracy: 0.7371 - loss: 0.5559 - val_accuracy: 0.7094 - val_loss: 0.5850
Epoch 309/500
10/10 0s 9ms/step -
accuracy: 0.6866 - loss: 0.6008 - val_accuracy: 0.7094 - val_loss: 0.5850
Epoch 310/500
10/10 0s 10ms/step -
accuracy: 0.7077 - loss: 0.5842 - val_accuracy: 0.7094 - val_loss: 0.5849
Epoch 311/500
10/10 0s 9ms/step -
accuracy: 0.7203 - loss: 0.5723 - val_accuracy: 0.7094 - val_loss: 0.5849
Epoch 312/500
10/10 0s 9ms/step -
accuracy: 0.7159 - loss: 0.5785 - val_accuracy: 0.7094 - val_loss: 0.5848
Epoch 313/500
10/10 0s 9ms/step -
accuracy: 0.7022 - loss: 0.5877 - val_accuracy: 0.7094 - val_loss: 0.5848
Epoch 314/500
10/10 0s 13ms/step -
accuracy: 0.7326 - loss: 0.5583 - val_accuracy: 0.7094 - val_loss: 0.5847
Epoch 315/500
10/10 0s 10ms/step -
accuracy: 0.7157 - loss: 0.5720 - val_accuracy: 0.7094 - val_loss: 0.5847
Epoch 316/500
10/10 0s 10ms/step -
accuracy: 0.7302 - loss: 0.5604 - val_accuracy: 0.7094 - val_loss: 0.5846
Epoch 317/500
10/10 0s 9ms/step -
accuracy: 0.6985 - loss: 0.5860 - val_accuracy: 0.7094 - val_loss: 0.5846

Epoch 318/500
10/10 0s 9ms/step -
accuracy: 0.7070 - loss: 0.5832 - val_accuracy: 0.7094 - val_loss: 0.5845
Epoch 319/500
10/10 0s 8ms/step -
accuracy: 0.7319 - loss: 0.5582 - val_accuracy: 0.7094 - val_loss: 0.5844
Epoch 320/500
10/10 0s 12ms/step -
accuracy: 0.7100 - loss: 0.5786 - val_accuracy: 0.7094 - val_loss: 0.5844
Epoch 321/500
10/10 0s 9ms/step -
accuracy: 0.7283 - loss: 0.5671 - val_accuracy: 0.7094 - val_loss: 0.5843
Epoch 322/500
10/10 0s 15ms/step -
accuracy: 0.7024 - loss: 0.5880 - val_accuracy: 0.7094 - val_loss: 0.5843
Epoch 323/500
10/10 0s 10ms/step -
accuracy: 0.7135 - loss: 0.5740 - val_accuracy: 0.7094 - val_loss: 0.5842
Epoch 324/500
10/10 0s 9ms/step -
accuracy: 0.7138 - loss: 0.5773 - val_accuracy: 0.7094 - val_loss: 0.5842
Epoch 325/500
10/10 0s 10ms/step -
accuracy: 0.7054 - loss: 0.5834 - val_accuracy: 0.7094 - val_loss: 0.5841
Epoch 326/500
10/10 0s 10ms/step -
accuracy: 0.7092 - loss: 0.5769 - val_accuracy: 0.7094 - val_loss: 0.5841
Epoch 327/500
10/10 0s 9ms/step -
accuracy: 0.7035 - loss: 0.5857 - val_accuracy: 0.7094 - val_loss: 0.5840
Epoch 328/500
10/10 0s 10ms/step -
accuracy: 0.7158 - loss: 0.5688 - val_accuracy: 0.7094 - val_loss: 0.5840
Epoch 329/500
10/10 0s 12ms/step -
accuracy: 0.7001 - loss: 0.5913 - val_accuracy: 0.7094 - val_loss: 0.5839
Epoch 330/500
10/10 0s 10ms/step -
accuracy: 0.7263 - loss: 0.5665 - val_accuracy: 0.7094 - val_loss: 0.5839
Epoch 331/500
10/10 0s 9ms/step -
accuracy: 0.6962 - loss: 0.5953 - val_accuracy: 0.7094 - val_loss: 0.5838
Epoch 332/500
10/10 0s 9ms/step -
accuracy: 0.7039 - loss: 0.5822 - val_accuracy: 0.7094 - val_loss: 0.5838
Epoch 333/500
10/10 0s 10ms/step -
accuracy: 0.6824 - loss: 0.6059 - val_accuracy: 0.7094 - val_loss: 0.5837

Epoch 334/500
10/10 0s 10ms/step -
accuracy: 0.7326 - loss: 0.5595 - val_accuracy: 0.7094 - val_loss: 0.5836
Epoch 335/500
10/10 0s 9ms/step -
accuracy: 0.7084 - loss: 0.5805 - val_accuracy: 0.7094 - val_loss: 0.5836
Epoch 336/500
10/10 0s 9ms/step -
accuracy: 0.7348 - loss: 0.5569 - val_accuracy: 0.7094 - val_loss: 0.5835
Epoch 337/500
10/10 0s 11ms/step -
accuracy: 0.7181 - loss: 0.5766 - val_accuracy: 0.7094 - val_loss: 0.5835
Epoch 338/500
10/10 0s 14ms/step -
accuracy: 0.6975 - loss: 0.5926 - val_accuracy: 0.7094 - val_loss: 0.5834
Epoch 339/500
10/10 0s 19ms/step -
accuracy: 0.7027 - loss: 0.5851 - val_accuracy: 0.7094 - val_loss: 0.5834
Epoch 340/500
10/10 0s 12ms/step -
accuracy: 0.7413 - loss: 0.5544 - val_accuracy: 0.7094 - val_loss: 0.5833
Epoch 341/500
10/10 0s 10ms/step -
accuracy: 0.7024 - loss: 0.5921 - val_accuracy: 0.7094 - val_loss: 0.5833
Epoch 342/500
10/10 0s 10ms/step -
accuracy: 0.7121 - loss: 0.5777 - val_accuracy: 0.7094 - val_loss: 0.5832
Epoch 343/500
10/10 0s 10ms/step -
accuracy: 0.7310 - loss: 0.5607 - val_accuracy: 0.7094 - val_loss: 0.5832
Epoch 344/500
10/10 0s 10ms/step -
accuracy: 0.7170 - loss: 0.5679 - val_accuracy: 0.7094 - val_loss: 0.5831
Epoch 345/500
10/10 0s 10ms/step -
accuracy: 0.7103 - loss: 0.5765 - val_accuracy: 0.7094 - val_loss: 0.5831
Epoch 346/500
10/10 0s 10ms/step -
accuracy: 0.7253 - loss: 0.5688 - val_accuracy: 0.7094 - val_loss: 0.5830
Epoch 347/500
10/10 0s 9ms/step -
accuracy: 0.7195 - loss: 0.5729 - val_accuracy: 0.7094 - val_loss: 0.5830
Epoch 348/500
10/10 0s 11ms/step -
accuracy: 0.6723 - loss: 0.6121 - val_accuracy: 0.7094 - val_loss: 0.5829
Epoch 349/500
10/10 0s 10ms/step -
accuracy: 0.7196 - loss: 0.5705 - val_accuracy: 0.7094 - val_loss: 0.5829

Epoch 350/500
10/10 0s 9ms/step -
accuracy: 0.7188 - loss: 0.5679 - val_accuracy: 0.7094 - val_loss: 0.5828
Epoch 351/500
10/10 0s 9ms/step -
accuracy: 0.7036 - loss: 0.5863 - val_accuracy: 0.7094 - val_loss: 0.5828
Epoch 352/500
10/10 0s 10ms/step -
accuracy: 0.7063 - loss: 0.5812 - val_accuracy: 0.7094 - val_loss: 0.5827
Epoch 353/500
10/10 0s 15ms/step -
accuracy: 0.7079 - loss: 0.5808 - val_accuracy: 0.7094 - val_loss: 0.5827
Epoch 354/500
10/10 0s 15ms/step -
accuracy: 0.7199 - loss: 0.5758 - val_accuracy: 0.7094 - val_loss: 0.5826
Epoch 355/500
10/10 0s 16ms/step -
accuracy: 0.7260 - loss: 0.5674 - val_accuracy: 0.7094 - val_loss: 0.5826
Epoch 356/500
10/10 0s 14ms/step -
accuracy: 0.7086 - loss: 0.5832 - val_accuracy: 0.7094 - val_loss: 0.5825
Epoch 357/500
10/10 0s 13ms/step -
accuracy: 0.7108 - loss: 0.5812 - val_accuracy: 0.7094 - val_loss: 0.5825
Epoch 358/500
10/10 0s 14ms/step -
accuracy: 0.7207 - loss: 0.5685 - val_accuracy: 0.7094 - val_loss: 0.5824
Epoch 359/500
10/10 0s 13ms/step -
accuracy: 0.7191 - loss: 0.5693 - val_accuracy: 0.7094 - val_loss: 0.5824
Epoch 360/500
10/10 0s 13ms/step -
accuracy: 0.7166 - loss: 0.5699 - val_accuracy: 0.7094 - val_loss: 0.5823
Epoch 361/500
10/10 0s 11ms/step -
accuracy: 0.7221 - loss: 0.5667 - val_accuracy: 0.7094 - val_loss: 0.5823
Epoch 362/500
10/10 0s 15ms/step -
accuracy: 0.7425 - loss: 0.5508 - val_accuracy: 0.7094 - val_loss: 0.5822
Epoch 363/500
10/10 0s 13ms/step -
accuracy: 0.7202 - loss: 0.5666 - val_accuracy: 0.7094 - val_loss: 0.5822
Epoch 364/500
10/10 0s 12ms/step -
accuracy: 0.7033 - loss: 0.5831 - val_accuracy: 0.7094 - val_loss: 0.5821
Epoch 365/500
10/10 0s 12ms/step -
accuracy: 0.7157 - loss: 0.5684 - val_accuracy: 0.7094 - val_loss: 0.5821

Epoch 366/500
10/10 0s 15ms/step -
accuracy: 0.7206 - loss: 0.5739 - val_accuracy: 0.7094 - val_loss: 0.5820
Epoch 367/500
10/10 0s 10ms/step -
accuracy: 0.7174 - loss: 0.5695 - val_accuracy: 0.7094 - val_loss: 0.5820
Epoch 368/500
10/10 0s 10ms/step -
accuracy: 0.6749 - loss: 0.6090 - val_accuracy: 0.7094 - val_loss: 0.5819
Epoch 369/500
10/10 0s 9ms/step -
accuracy: 0.7066 - loss: 0.5804 - val_accuracy: 0.7094 - val_loss: 0.5819
Epoch 370/500
10/10 0s 18ms/step -
accuracy: 0.7190 - loss: 0.5634 - val_accuracy: 0.7094 - val_loss: 0.5818
Epoch 371/500
10/10 0s 10ms/step -
accuracy: 0.7169 - loss: 0.5746 - val_accuracy: 0.7094 - val_loss: 0.5818
Epoch 372/500
10/10 0s 11ms/step -
accuracy: 0.6952 - loss: 0.5887 - val_accuracy: 0.7094 - val_loss: 0.5817
Epoch 373/500
10/10 0s 17ms/step -
accuracy: 0.6894 - loss: 0.5944 - val_accuracy: 0.7094 - val_loss: 0.5817
Epoch 374/500
10/10 0s 10ms/step -
accuracy: 0.7152 - loss: 0.5759 - val_accuracy: 0.7094 - val_loss: 0.5816
Epoch 375/500
10/10 0s 10ms/step -
accuracy: 0.7119 - loss: 0.5800 - val_accuracy: 0.7094 - val_loss: 0.5816
Epoch 376/500
10/10 0s 9ms/step -
accuracy: 0.7329 - loss: 0.5559 - val_accuracy: 0.7094 - val_loss: 0.5815
Epoch 377/500
10/10 0s 9ms/step -
accuracy: 0.7125 - loss: 0.5781 - val_accuracy: 0.7094 - val_loss: 0.5815
Epoch 378/500
10/10 0s 10ms/step -
accuracy: 0.7208 - loss: 0.5699 - val_accuracy: 0.7094 - val_loss: 0.5814
Epoch 379/500
10/10 0s 12ms/step -
accuracy: 0.7226 - loss: 0.5685 - val_accuracy: 0.7094 - val_loss: 0.5814
Epoch 380/500
10/10 0s 10ms/step -
accuracy: 0.7221 - loss: 0.5728 - val_accuracy: 0.7094 - val_loss: 0.5813
Epoch 381/500
10/10 0s 9ms/step -
accuracy: 0.7358 - loss: 0.5535 - val_accuracy: 0.7094 - val_loss: 0.5813

Epoch 382/500
10/10 0s 9ms/step -
accuracy: 0.7146 - loss: 0.5774 - val_accuracy: 0.7094 - val_loss: 0.5812

Epoch 383/500
10/10 0s 10ms/step -
accuracy: 0.7437 - loss: 0.5483 - val_accuracy: 0.7094 - val_loss: 0.5812

Epoch 384/500
10/10 0s 16ms/step -
accuracy: 0.7040 - loss: 0.5878 - val_accuracy: 0.7094 - val_loss: 0.5811

Epoch 385/500
10/10 0s 9ms/step -
accuracy: 0.7186 - loss: 0.5692 - val_accuracy: 0.7094 - val_loss: 0.5811

Epoch 386/500
10/10 0s 9ms/step -
accuracy: 0.7171 - loss: 0.5754 - val_accuracy: 0.7094 - val_loss: 0.5810

Epoch 387/500
10/10 0s 11ms/step -
accuracy: 0.7100 - loss: 0.5810 - val_accuracy: 0.7094 - val_loss: 0.5810

Epoch 388/500
10/10 0s 11ms/step -
accuracy: 0.7141 - loss: 0.5729 - val_accuracy: 0.7094 - val_loss: 0.5810

Epoch 389/500
10/10 0s 11ms/step -
accuracy: 0.7255 - loss: 0.5628 - val_accuracy: 0.7094 - val_loss: 0.5809

Epoch 390/500
10/10 0s 10ms/step -
accuracy: 0.7399 - loss: 0.5527 - val_accuracy: 0.7094 - val_loss: 0.5809

Epoch 391/500
10/10 0s 10ms/step -
accuracy: 0.6762 - loss: 0.6050 - val_accuracy: 0.7094 - val_loss: 0.5808

Epoch 392/500
10/10 0s 10ms/step -
accuracy: 0.6960 - loss: 0.5950 - val_accuracy: 0.7094 - val_loss: 0.5808

Epoch 393/500
10/10 0s 10ms/step -
accuracy: 0.6969 - loss: 0.5851 - val_accuracy: 0.7094 - val_loss: 0.5807

Epoch 394/500
10/10 0s 9ms/step -
accuracy: 0.7333 - loss: 0.5524 - val_accuracy: 0.7094 - val_loss: 0.5807

Epoch 395/500
10/10 0s 10ms/step -
accuracy: 0.7235 - loss: 0.5653 - val_accuracy: 0.7094 - val_loss: 0.5806

Epoch 396/500
10/10 0s 9ms/step -
accuracy: 0.7427 - loss: 0.5465 - val_accuracy: 0.7094 - val_loss: 0.5806

Epoch 397/500
10/10 0s 10ms/step -
accuracy: 0.7199 - loss: 0.5625 - val_accuracy: 0.7094 - val_loss: 0.5805

Epoch 398/500
10/10 0s 15ms/step -
accuracy: 0.7284 - loss: 0.5628 - val_accuracy: 0.7094 - val_loss: 0.5805
Epoch 399/500
10/10 0s 9ms/step -
accuracy: 0.7230 - loss: 0.5639 - val_accuracy: 0.7094 - val_loss: 0.5804
Epoch 400/500
10/10 0s 9ms/step -
accuracy: 0.7034 - loss: 0.5801 - val_accuracy: 0.7094 - val_loss: 0.5804
Epoch 401/500
10/10 0s 10ms/step -
accuracy: 0.7018 - loss: 0.5850 - val_accuracy: 0.7094 - val_loss: 0.5803
Epoch 402/500
10/10 0s 10ms/step -
accuracy: 0.7084 - loss: 0.5777 - val_accuracy: 0.7094 - val_loss: 0.5803
Epoch 403/500
10/10 0s 10ms/step -
accuracy: 0.7118 - loss: 0.5703 - val_accuracy: 0.7094 - val_loss: 0.5802
Epoch 404/500
10/10 0s 10ms/step -
accuracy: 0.7095 - loss: 0.5735 - val_accuracy: 0.7094 - val_loss: 0.5802
Epoch 405/500
10/10 0s 9ms/step -
accuracy: 0.7342 - loss: 0.5578 - val_accuracy: 0.7094 - val_loss: 0.5801
Epoch 406/500
10/10 0s 9ms/step -
accuracy: 0.7188 - loss: 0.5653 - val_accuracy: 0.7094 - val_loss: 0.5801
Epoch 407/500
10/10 0s 14ms/step -
accuracy: 0.6897 - loss: 0.5960 - val_accuracy: 0.7094 - val_loss: 0.5800
Epoch 408/500
10/10 0s 9ms/step -
accuracy: 0.6825 - loss: 0.5972 - val_accuracy: 0.7094 - val_loss: 0.5800
Epoch 409/500
10/10 0s 9ms/step -
accuracy: 0.6982 - loss: 0.5844 - val_accuracy: 0.7094 - val_loss: 0.5799
Epoch 410/500
10/10 0s 9ms/step -
accuracy: 0.6965 - loss: 0.5909 - val_accuracy: 0.7094 - val_loss: 0.5799
Epoch 411/500
10/10 0s 10ms/step -
accuracy: 0.7156 - loss: 0.5711 - val_accuracy: 0.7094 - val_loss: 0.5799
Epoch 412/500
10/10 0s 16ms/step -
accuracy: 0.6961 - loss: 0.5862 - val_accuracy: 0.7094 - val_loss: 0.5798
Epoch 413/500
10/10 0s 9ms/step -
accuracy: 0.7418 - loss: 0.5479 - val_accuracy: 0.7094 - val_loss: 0.5797

Epoch 414/500
10/10 0s 9ms/step -
accuracy: 0.7029 - loss: 0.5836 - val_accuracy: 0.7094 - val_loss: 0.5797

Epoch 415/500
10/10 0s 9ms/step -
accuracy: 0.7111 - loss: 0.5713 - val_accuracy: 0.7094 - val_loss: 0.5797

Epoch 416/500
10/10 0s 10ms/step -
accuracy: 0.6914 - loss: 0.5939 - val_accuracy: 0.7094 - val_loss: 0.5796

Epoch 417/500
10/10 0s 9ms/step -
accuracy: 0.7262 - loss: 0.5629 - val_accuracy: 0.7094 - val_loss: 0.5796

Epoch 418/500
10/10 0s 9ms/step -
accuracy: 0.7287 - loss: 0.5596 - val_accuracy: 0.7094 - val_loss: 0.5795

Epoch 419/500
10/10 0s 10ms/step -
accuracy: 0.6879 - loss: 0.5945 - val_accuracy: 0.7094 - val_loss: 0.5795

Epoch 420/500
10/10 0s 11ms/step -
accuracy: 0.7276 - loss: 0.5569 - val_accuracy: 0.7094 - val_loss: 0.5794

Epoch 421/500
10/10 0s 10ms/step -
accuracy: 0.7108 - loss: 0.5735 - val_accuracy: 0.7094 - val_loss: 0.5794

Epoch 422/500
10/10 0s 9ms/step -
accuracy: 0.7419 - loss: 0.5449 - val_accuracy: 0.7094 - val_loss: 0.5793

Epoch 423/500
10/10 0s 11ms/step -
accuracy: 0.7176 - loss: 0.5675 - val_accuracy: 0.7094 - val_loss: 0.5793

Epoch 424/500
10/10 0s 9ms/step -
accuracy: 0.6911 - loss: 0.5862 - val_accuracy: 0.7094 - val_loss: 0.5792

Epoch 425/500
10/10 0s 10ms/step -
accuracy: 0.7200 - loss: 0.5644 - val_accuracy: 0.7094 - val_loss: 0.5792

Epoch 426/500
10/10 0s 12ms/step -
accuracy: 0.6816 - loss: 0.5955 - val_accuracy: 0.7094 - val_loss: 0.5792

Epoch 427/500
10/10 0s 11ms/step -
accuracy: 0.7024 - loss: 0.5828 - val_accuracy: 0.7094 - val_loss: 0.5791

Epoch 428/500
10/10 0s 12ms/step -
accuracy: 0.7074 - loss: 0.5777 - val_accuracy: 0.7094 - val_loss: 0.5791

Epoch 429/500
10/10 0s 15ms/step -
accuracy: 0.6973 - loss: 0.5878 - val_accuracy: 0.7094 - val_loss: 0.5790

Epoch 430/500
10/10 0s 13ms/step -
accuracy: 0.7004 - loss: 0.5837 - val_accuracy: 0.7094 - val_loss: 0.5790
Epoch 431/500
10/10 0s 10ms/step -
accuracy: 0.7207 - loss: 0.5668 - val_accuracy: 0.7094 - val_loss: 0.5789
Epoch 432/500
10/10 0s 10ms/step -
accuracy: 0.7014 - loss: 0.5816 - val_accuracy: 0.7094 - val_loss: 0.5789
Epoch 433/500
10/10 0s 10ms/step -
accuracy: 0.7117 - loss: 0.5734 - val_accuracy: 0.7094 - val_loss: 0.5788
Epoch 434/500
10/10 0s 11ms/step -
accuracy: 0.7280 - loss: 0.5657 - val_accuracy: 0.7094 - val_loss: 0.5788
Epoch 435/500
10/10 0s 10ms/step -
accuracy: 0.7246 - loss: 0.5635 - val_accuracy: 0.7094 - val_loss: 0.5787
Epoch 436/500
10/10 0s 10ms/step -
accuracy: 0.7135 - loss: 0.5711 - val_accuracy: 0.7094 - val_loss: 0.5787
Epoch 437/500
10/10 0s 10ms/step -
accuracy: 0.7113 - loss: 0.5742 - val_accuracy: 0.7094 - val_loss: 0.5786
Epoch 438/500
10/10 0s 17ms/step -
accuracy: 0.6983 - loss: 0.5855 - val_accuracy: 0.7094 - val_loss: 0.5786
Epoch 439/500
10/10 0s 13ms/step -
accuracy: 0.7327 - loss: 0.5589 - val_accuracy: 0.7094 - val_loss: 0.5785
Epoch 440/500
10/10 0s 13ms/step -
accuracy: 0.7219 - loss: 0.5610 - val_accuracy: 0.7094 - val_loss: 0.5785
Epoch 441/500
10/10 0s 11ms/step -
accuracy: 0.7068 - loss: 0.5734 - val_accuracy: 0.7094 - val_loss: 0.5785
Epoch 442/500
10/10 0s 12ms/step -
accuracy: 0.7115 - loss: 0.5750 - val_accuracy: 0.7094 - val_loss: 0.5784
Epoch 443/500
10/10 0s 12ms/step -
accuracy: 0.7211 - loss: 0.5631 - val_accuracy: 0.7094 - val_loss: 0.5784
Epoch 444/500
10/10 0s 15ms/step -
accuracy: 0.6912 - loss: 0.5943 - val_accuracy: 0.7094 - val_loss: 0.5783
Epoch 445/500
10/10 0s 12ms/step -
accuracy: 0.6991 - loss: 0.5850 - val_accuracy: 0.7094 - val_loss: 0.5783

Epoch 446/500
10/10 0s 11ms/step -
accuracy: 0.7098 - loss: 0.5689 - val_accuracy: 0.7094 - val_loss: 0.5782
Epoch 447/500
10/10 0s 10ms/step -
accuracy: 0.7279 - loss: 0.5598 - val_accuracy: 0.7094 - val_loss: 0.5782
Epoch 448/500
10/10 0s 9ms/step -
accuracy: 0.7299 - loss: 0.5543 - val_accuracy: 0.7094 - val_loss: 0.5781
Epoch 449/500
10/10 0s 13ms/step -
accuracy: 0.7268 - loss: 0.5651 - val_accuracy: 0.7094 - val_loss: 0.5781
Epoch 450/500
10/10 0s 11ms/step -
accuracy: 0.7171 - loss: 0.5672 - val_accuracy: 0.7094 - val_loss: 0.5781
Epoch 451/500
10/10 0s 10ms/step -
accuracy: 0.7324 - loss: 0.5494 - val_accuracy: 0.7094 - val_loss: 0.5780
Epoch 452/500
10/10 0s 9ms/step -
accuracy: 0.7284 - loss: 0.5569 - val_accuracy: 0.7094 - val_loss: 0.5780
Epoch 453/500
10/10 0s 8ms/step -
accuracy: 0.7230 - loss: 0.5611 - val_accuracy: 0.7094 - val_loss: 0.5779
Epoch 454/500
10/10 0s 12ms/step -
accuracy: 0.7193 - loss: 0.5674 - val_accuracy: 0.7094 - val_loss: 0.5779
Epoch 455/500
10/10 0s 9ms/step -
accuracy: 0.7089 - loss: 0.5713 - val_accuracy: 0.7094 - val_loss: 0.5778
Epoch 456/500
10/10 0s 10ms/step -
accuracy: 0.6975 - loss: 0.5876 - val_accuracy: 0.7094 - val_loss: 0.5778
Epoch 457/500
10/10 0s 10ms/step -
accuracy: 0.7178 - loss: 0.5635 - val_accuracy: 0.7094 - val_loss: 0.5778
Epoch 458/500
10/10 0s 9ms/step -
accuracy: 0.7194 - loss: 0.5604 - val_accuracy: 0.7094 - val_loss: 0.5777
Epoch 459/500
10/10 0s 17ms/step -
accuracy: 0.7264 - loss: 0.5595 - val_accuracy: 0.7094 - val_loss: 0.5777
Epoch 460/500
10/10 0s 11ms/step -
accuracy: 0.6957 - loss: 0.5850 - val_accuracy: 0.7094 - val_loss: 0.5776
Epoch 461/500
10/10 0s 12ms/step -
accuracy: 0.7160 - loss: 0.5706 - val_accuracy: 0.7094 - val_loss: 0.5776

Epoch 462/500
10/10 0s 12ms/step -
accuracy: 0.6864 - loss: 0.5945 - val_accuracy: 0.7094 - val_loss: 0.5776
Epoch 463/500
10/10 0s 17ms/step -
accuracy: 0.7214 - loss: 0.5660 - val_accuracy: 0.7094 - val_loss: 0.5775
Epoch 464/500
10/10 0s 14ms/step -
accuracy: 0.7097 - loss: 0.5737 - val_accuracy: 0.7094 - val_loss: 0.5775
Epoch 465/500
10/10 0s 11ms/step -
accuracy: 0.7239 - loss: 0.5654 - val_accuracy: 0.7094 - val_loss: 0.5774
Epoch 466/500
10/10 0s 12ms/step -
accuracy: 0.7095 - loss: 0.5728 - val_accuracy: 0.7094 - val_loss: 0.5774
Epoch 467/500
10/10 0s 13ms/step -
accuracy: 0.7362 - loss: 0.5509 - val_accuracy: 0.7094 - val_loss: 0.5773
Epoch 468/500
10/10 0s 14ms/step -
accuracy: 0.7289 - loss: 0.5549 - val_accuracy: 0.7094 - val_loss: 0.5773
Epoch 469/500
10/10 0s 36ms/step -
accuracy: 0.6860 - loss: 0.5953 - val_accuracy: 0.7094 - val_loss: 0.5772
Epoch 470/500
10/10 1s 38ms/step -
accuracy: 0.7111 - loss: 0.5752 - val_accuracy: 0.7094 - val_loss: 0.5772
Epoch 471/500
10/10 0s 20ms/step -
accuracy: 0.7280 - loss: 0.5551 - val_accuracy: 0.7094 - val_loss: 0.5772
Epoch 472/500
10/10 0s 18ms/step -
accuracy: 0.7083 - loss: 0.5751 - val_accuracy: 0.7094 - val_loss: 0.5771
Epoch 473/500
10/10 0s 25ms/step -
accuracy: 0.6989 - loss: 0.5840 - val_accuracy: 0.7094 - val_loss: 0.5771
Epoch 474/500
10/10 0s 17ms/step -
accuracy: 0.7168 - loss: 0.5655 - val_accuracy: 0.7094 - val_loss: 0.5770
Epoch 475/500
10/10 0s 34ms/step -
accuracy: 0.7133 - loss: 0.5754 - val_accuracy: 0.7094 - val_loss: 0.5770
Epoch 476/500
10/10 0s 38ms/step -
accuracy: 0.6930 - loss: 0.5811 - val_accuracy: 0.7094 - val_loss: 0.5769
Epoch 477/500
10/10 0s 15ms/step -
accuracy: 0.7289 - loss: 0.5566 - val_accuracy: 0.7094 - val_loss: 0.5769

Epoch 478/500
10/10 0s 12ms/step -
accuracy: 0.7202 - loss: 0.5686 - val_accuracy: 0.7094 - val_loss: 0.5769
Epoch 479/500
10/10 0s 12ms/step -
accuracy: 0.7091 - loss: 0.5741 - val_accuracy: 0.7094 - val_loss: 0.5768
Epoch 480/500
10/10 0s 11ms/step -
accuracy: 0.7248 - loss: 0.5622 - val_accuracy: 0.7094 - val_loss: 0.5768
Epoch 481/500
10/10 0s 11ms/step -
accuracy: 0.7144 - loss: 0.5724 - val_accuracy: 0.7094 - val_loss: 0.5767
Epoch 482/500
10/10 0s 13ms/step -
accuracy: 0.7206 - loss: 0.5677 - val_accuracy: 0.7094 - val_loss: 0.5767
Epoch 483/500
10/10 0s 11ms/step -
accuracy: 0.7301 - loss: 0.5572 - val_accuracy: 0.7094 - val_loss: 0.5767
Epoch 484/500
10/10 0s 12ms/step -
accuracy: 0.6975 - loss: 0.5804 - val_accuracy: 0.7094 - val_loss: 0.5766
Epoch 485/500
10/10 0s 11ms/step -
accuracy: 0.7120 - loss: 0.5705 - val_accuracy: 0.7094 - val_loss: 0.5766
Epoch 486/500
10/10 0s 12ms/step -
accuracy: 0.7115 - loss: 0.5761 - val_accuracy: 0.7094 - val_loss: 0.5765
Epoch 487/500
10/10 0s 14ms/step -
accuracy: 0.6975 - loss: 0.5860 - val_accuracy: 0.7094 - val_loss: 0.5765
Epoch 488/500
10/10 0s 11ms/step -
accuracy: 0.6904 - loss: 0.5894 - val_accuracy: 0.7094 - val_loss: 0.5765
Epoch 489/500
10/10 0s 12ms/step -
accuracy: 0.7056 - loss: 0.5693 - val_accuracy: 0.7094 - val_loss: 0.5764
Epoch 490/500
10/10 0s 13ms/step -
accuracy: 0.7150 - loss: 0.5692 - val_accuracy: 0.7094 - val_loss: 0.5764
Epoch 491/500
10/10 0s 22ms/step -
accuracy: 0.7039 - loss: 0.5789 - val_accuracy: 0.7094 - val_loss: 0.5763
Epoch 492/500
10/10 0s 12ms/step -
accuracy: 0.7112 - loss: 0.5657 - val_accuracy: 0.7094 - val_loss: 0.5763
Epoch 493/500
10/10 0s 12ms/step -
accuracy: 0.7126 - loss: 0.5702 - val_accuracy: 0.7094 - val_loss: 0.5763

```

Epoch 494/500
10/10          0s 12ms/step -
accuracy: 0.7210 - loss: 0.5618 - val_accuracy: 0.7094 - val_loss: 0.5762
Epoch 495/500
10/10          0s 14ms/step -
accuracy: 0.7014 - loss: 0.5772 - val_accuracy: 0.7094 - val_loss: 0.5762
Epoch 496/500
10/10          0s 16ms/step -
accuracy: 0.7188 - loss: 0.5688 - val_accuracy: 0.7094 - val_loss: 0.5761
Epoch 497/500
10/10          0s 12ms/step -
accuracy: 0.7081 - loss: 0.5722 - val_accuracy: 0.7094 - val_loss: 0.5761
Epoch 498/500
10/10          0s 12ms/step -
accuracy: 0.7181 - loss: 0.5666 - val_accuracy: 0.7094 - val_loss: 0.5761
Epoch 499/500
10/10          0s 13ms/step -
accuracy: 0.7171 - loss: 0.5622 - val_accuracy: 0.7094 - val_loss: 0.5760
Epoch 500/500
10/10          0s 14ms/step -
accuracy: 0.7340 - loss: 0.5553 - val_accuracy: 0.7094 - val_loss: 0.5760

```

```

[36]: # Training accuracy over epochs
train_accuracies = history.history['accuracy']

# Validation accuracy over epochs
val_accuracies = history.history['val_accuracy']

# Final validation accuracy
print(f"Final Validation Accuracy: {val_accuracies[-1] * 100:.2f}%")

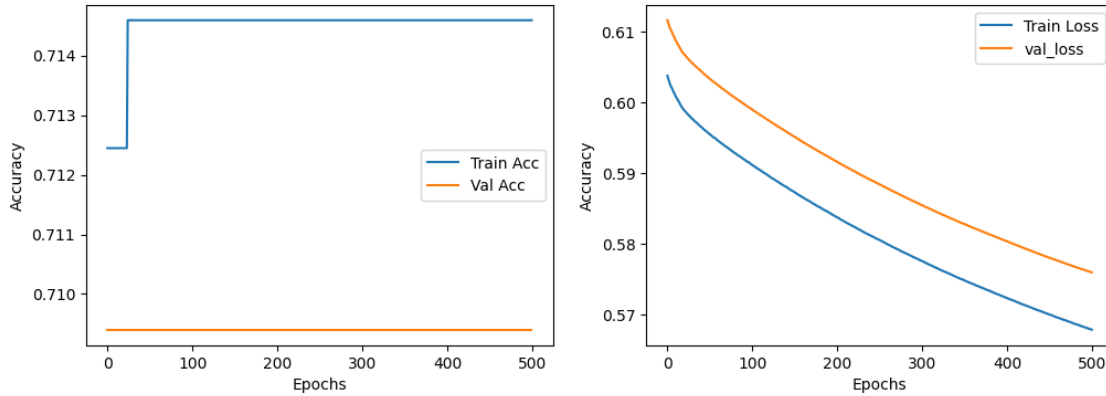
```

Final Validation Accuracy: 70.94%

```

[37]: plt.figure(figsize=(12,4))
plt.subplot(1,2,1)
plt.plot(history.history['accuracy'], label='Train Acc')
plt.plot(history.history['val_accuracy'], label='Val Acc')
plt.xlabel('Epochs')
plt.ylabel('Accuracy')
plt.legend()
plt.subplot(1,2,2)
plt.plot(history.history['loss'], label='Train Loss')
plt.plot(history.history['val_loss'], label='val_loss')
plt.xlabel('Epochs')
plt.ylabel('Accuracy')
plt.legend()
plt.show()

```



0.5 Adding 2 neurons in the output layer

```
[39]: ### This step does one hot encoding for the output variable
y_train_2 = keras.utils.to_categorical(y_train,2)
y_test_2 = keras.utils.to_categorical(y_test,2)
```

```
[40]: model = Sequential()
model.add(Dense(2,activation = 'softmax', input_shape = (9,)))
model.summary()
```

Model: "sequential_2"

Layer (type)	Output Shape	Param #
dense_3 (Dense)	(None, 2)	20

Total params: 20 (80.00 B)

Trainable params: 20 (80.00 B)

Non-trainable params: 0 (0.00 B)

```
[41]: model.compile(loss = "CategoricalCrossentropy", optimizer='SGD', metrics = ['accuracy'])
history = model.fit(x_train, y_train_2, batch_size=50, epochs=500,
                    verbose=1, validation_data=(x_test, y_test_2))
```

Epoch 1/500

10/10 1s 26ms/step -
 accuracy: 0.7309 - loss: 0.6042 - val_accuracy: 0.7094 - val_loss: 0.6260
 Epoch 2/500
 10/10 0s 9ms/step -
 accuracy: 0.7090 - loss: 0.6350 - val_accuracy: 0.7094 - val_loss: 0.6238
 Epoch 3/500
 10/10 0s 8ms/step -
 accuracy: 0.7271 - loss: 0.6069 - val_accuracy: 0.7094 - val_loss: 0.6220
 Epoch 4/500
 10/10 0s 9ms/step -
 accuracy: 0.7260 - loss: 0.6108 - val_accuracy: 0.7094 - val_loss: 0.6204
 Epoch 5/500
 10/10 0s 9ms/step -
 accuracy: 0.7123 - loss: 0.6244 - val_accuracy: 0.7094 - val_loss: 0.6189
 Epoch 6/500
 10/10 0s 11ms/step -
 accuracy: 0.7175 - loss: 0.6168 - val_accuracy: 0.7094 - val_loss: 0.6174
 Epoch 7/500
 10/10 0s 9ms/step -
 accuracy: 0.7133 - loss: 0.6259 - val_accuracy: 0.7094 - val_loss: 0.6165
 Epoch 8/500
 10/10 0s 11ms/step -
 accuracy: 0.7221 - loss: 0.6159 - val_accuracy: 0.7094 - val_loss: 0.6154
 Epoch 9/500
 10/10 0s 9ms/step -
 accuracy: 0.7068 - loss: 0.6231 - val_accuracy: 0.7094 - val_loss: 0.6143
 Epoch 10/500
 10/10 0s 8ms/step -
 accuracy: 0.7231 - loss: 0.6124 - val_accuracy: 0.7094 - val_loss: 0.6134
 Epoch 11/500
 10/10 0s 16ms/step -
 accuracy: 0.7438 - loss: 0.5837 - val_accuracy: 0.7094 - val_loss: 0.6125
 Epoch 12/500
 10/10 0s 9ms/step -
 accuracy: 0.6896 - loss: 0.6473 - val_accuracy: 0.7094 - val_loss: 0.6120
 Epoch 13/500
 10/10 0s 9ms/step -
 accuracy: 0.7191 - loss: 0.6153 - val_accuracy: 0.7094 - val_loss: 0.6113
 Epoch 14/500
 10/10 0s 8ms/step -
 accuracy: 0.7312 - loss: 0.5945 - val_accuracy: 0.7094 - val_loss: 0.6106
 Epoch 15/500
 10/10 0s 15ms/step -
 accuracy: 0.7152 - loss: 0.6131 - val_accuracy: 0.7094 - val_loss: 0.6102
 Epoch 16/500
 10/10 0s 10ms/step -
 accuracy: 0.7430 - loss: 0.5808 - val_accuracy: 0.7094 - val_loss: 0.6096
 Epoch 17/500

10/10 0s 8ms/step -
 accuracy: 0.7078 - loss: 0.6171 - val_accuracy: 0.7094 - val_loss: 0.6091
 Epoch 18/500
 10/10 0s 8ms/step -
 accuracy: 0.7034 - loss: 0.6224 - val_accuracy: 0.7094 - val_loss: 0.6088
 Epoch 19/500
 10/10 0s 8ms/step -
 accuracy: 0.7502 - loss: 0.5733 - val_accuracy: 0.7094 - val_loss: 0.6083
 Epoch 20/500
 10/10 0s 16ms/step -
 accuracy: 0.7208 - loss: 0.5999 - val_accuracy: 0.7094 - val_loss: 0.6080
 Epoch 21/500
 10/10 0s 8ms/step -
 accuracy: 0.7073 - loss: 0.6283 - val_accuracy: 0.7094 - val_loss: 0.6077
 Epoch 22/500
 10/10 0s 8ms/step -
 accuracy: 0.7318 - loss: 0.5945 - val_accuracy: 0.7094 - val_loss: 0.6074
 Epoch 23/500
 10/10 0s 8ms/step -
 accuracy: 0.7060 - loss: 0.6192 - val_accuracy: 0.7094 - val_loss: 0.6071
 Epoch 24/500
 10/10 0s 8ms/step -
 accuracy: 0.6986 - loss: 0.6248 - val_accuracy: 0.7094 - val_loss: 0.6069
 Epoch 25/500
 10/10 0s 8ms/step -
 accuracy: 0.7276 - loss: 0.6002 - val_accuracy: 0.7094 - val_loss: 0.6066
 Epoch 26/500
 10/10 0s 9ms/step -
 accuracy: 0.7202 - loss: 0.5981 - val_accuracy: 0.7094 - val_loss: 0.6062
 Epoch 27/500
 10/10 0s 9ms/step -
 accuracy: 0.7311 - loss: 0.5907 - val_accuracy: 0.7094 - val_loss: 0.6059
 Epoch 28/500
 10/10 0s 9ms/step -
 accuracy: 0.7192 - loss: 0.6035 - val_accuracy: 0.7094 - val_loss: 0.6057
 Epoch 29/500
 10/10 0s 9ms/step -
 accuracy: 0.7134 - loss: 0.6017 - val_accuracy: 0.7094 - val_loss: 0.6055
 Epoch 30/500
 10/10 0s 9ms/step -
 accuracy: 0.7138 - loss: 0.6009 - val_accuracy: 0.7094 - val_loss: 0.6052
 Epoch 31/500
 10/10 0s 9ms/step -
 accuracy: 0.7250 - loss: 0.5949 - val_accuracy: 0.7094 - val_loss: 0.6050
 Epoch 32/500
 10/10 0s 8ms/step -
 accuracy: 0.7254 - loss: 0.5900 - val_accuracy: 0.7094 - val_loss: 0.6048
 Epoch 33/500

10/10 0s 9ms/step -
 accuracy: 0.7433 - loss: 0.5800 - val_accuracy: 0.7094 - val_loss: 0.6045
 Epoch 34/500
 10/10 0s 9ms/step -
 accuracy: 0.7013 - loss: 0.6203 - val_accuracy: 0.7094 - val_loss: 0.6043
 Epoch 35/500
 10/10 0s 8ms/step -
 accuracy: 0.7257 - loss: 0.5892 - val_accuracy: 0.7094 - val_loss: 0.6041
 Epoch 36/500
 10/10 0s 8ms/step -
 accuracy: 0.7147 - loss: 0.6004 - val_accuracy: 0.7094 - val_loss: 0.6038
 Epoch 37/500
 10/10 0s 8ms/step -
 accuracy: 0.7070 - loss: 0.6069 - val_accuracy: 0.7094 - val_loss: 0.6036
 Epoch 38/500
 10/10 0s 8ms/step -
 accuracy: 0.6953 - loss: 0.6223 - val_accuracy: 0.7094 - val_loss: 0.6034
 Epoch 39/500
 10/10 0s 8ms/step -
 accuracy: 0.6948 - loss: 0.6186 - val_accuracy: 0.7094 - val_loss: 0.6032
 Epoch 40/500
 10/10 0s 8ms/step -
 accuracy: 0.7152 - loss: 0.6092 - val_accuracy: 0.7094 - val_loss: 0.6030
 Epoch 41/500
 10/10 0s 8ms/step -
 accuracy: 0.7160 - loss: 0.5984 - val_accuracy: 0.7094 - val_loss: 0.6028
 Epoch 42/500
 10/10 0s 8ms/step -
 accuracy: 0.7029 - loss: 0.6082 - val_accuracy: 0.7094 - val_loss: 0.6026
 Epoch 43/500
 10/10 0s 8ms/step -
 accuracy: 0.7234 - loss: 0.5922 - val_accuracy: 0.7094 - val_loss: 0.6024
 Epoch 44/500
 10/10 0s 8ms/step -
 accuracy: 0.7130 - loss: 0.6025 - val_accuracy: 0.7094 - val_loss: 0.6022
 Epoch 45/500
 10/10 0s 8ms/step -
 accuracy: 0.7169 - loss: 0.6033 - val_accuracy: 0.7094 - val_loss: 0.6020
 Epoch 46/500
 10/10 0s 8ms/step -
 accuracy: 0.7374 - loss: 0.5803 - val_accuracy: 0.7094 - val_loss: 0.6018
 Epoch 47/500
 10/10 0s 8ms/step -
 accuracy: 0.7205 - loss: 0.5952 - val_accuracy: 0.7094 - val_loss: 0.6016
 Epoch 48/500
 10/10 0s 11ms/step -
 accuracy: 0.7113 - loss: 0.6023 - val_accuracy: 0.7094 - val_loss: 0.6014
 Epoch 49/500

10/10 0s 8ms/step -
 accuracy: 0.7285 - loss: 0.5861 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 50/500
 10/10 0s 8ms/step -
 accuracy: 0.7228 - loss: 0.5866 - val_accuracy: 0.7094 - val_loss: 0.6010
 Epoch 51/500
 10/10 0s 8ms/step -
 accuracy: 0.7280 - loss: 0.5939 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 52/500
 10/10 0s 8ms/step -
 accuracy: 0.7082 - loss: 0.6112 - val_accuracy: 0.7094 - val_loss: 0.6006
 Epoch 53/500
 10/10 0s 8ms/step -
 accuracy: 0.7239 - loss: 0.5899 - val_accuracy: 0.7094 - val_loss: 0.6004
 Epoch 54/500
 10/10 0s 8ms/step -
 accuracy: 0.7100 - loss: 0.6028 - val_accuracy: 0.7094 - val_loss: 0.6003
 Epoch 55/500
 10/10 0s 8ms/step -
 accuracy: 0.7206 - loss: 0.5945 - val_accuracy: 0.7094 - val_loss: 0.6001
 Epoch 56/500
 10/10 0s 12ms/step -
 accuracy: 0.7119 - loss: 0.6077 - val_accuracy: 0.7094 - val_loss: 0.5999
 Epoch 57/500
 10/10 0s 7ms/step -
 accuracy: 0.7069 - loss: 0.6127 - val_accuracy: 0.7094 - val_loss: 0.5997
 Epoch 58/500
 10/10 0s 8ms/step -
 accuracy: 0.7081 - loss: 0.6051 - val_accuracy: 0.7094 - val_loss: 0.5995
 Epoch 59/500
 10/10 0s 8ms/step -
 accuracy: 0.6930 - loss: 0.6220 - val_accuracy: 0.7094 - val_loss: 0.5993
 Epoch 60/500
 10/10 0s 8ms/step -
 accuracy: 0.7269 - loss: 0.5905 - val_accuracy: 0.7094 - val_loss: 0.5991
 Epoch 61/500
 10/10 0s 8ms/step -
 accuracy: 0.7041 - loss: 0.6104 - val_accuracy: 0.7094 - val_loss: 0.5989
 Epoch 62/500
 10/10 0s 8ms/step -
 accuracy: 0.6923 - loss: 0.6175 - val_accuracy: 0.7094 - val_loss: 0.5987
 Epoch 63/500
 10/10 0s 8ms/step -
 accuracy: 0.7064 - loss: 0.6083 - val_accuracy: 0.7094 - val_loss: 0.5985
 Epoch 64/500
 10/10 0s 8ms/step -
 accuracy: 0.7445 - loss: 0.5741 - val_accuracy: 0.7094 - val_loss: 0.5984
 Epoch 65/500

10/10 0s 8ms/step -
 accuracy: 0.7376 - loss: 0.5792 - val_accuracy: 0.7094 - val_loss: 0.5982
 Epoch 66/500
 10/10 0s 9ms/step -
 accuracy: 0.7317 - loss: 0.5833 - val_accuracy: 0.7094 - val_loss: 0.5980
 Epoch 67/500
 10/10 0s 14ms/step -
 accuracy: 0.6952 - loss: 0.6143 - val_accuracy: 0.7094 - val_loss: 0.5978
 Epoch 68/500
 10/10 0s 10ms/step -
 accuracy: 0.7070 - loss: 0.6073 - val_accuracy: 0.7094 - val_loss: 0.5976
 Epoch 69/500
 10/10 0s 9ms/step -
 accuracy: 0.7243 - loss: 0.5886 - val_accuracy: 0.7094 - val_loss: 0.5975
 Epoch 70/500
 10/10 0s 8ms/step -
 accuracy: 0.7378 - loss: 0.5739 - val_accuracy: 0.7094 - val_loss: 0.5973
 Epoch 71/500
 10/10 0s 9ms/step -
 accuracy: 0.7309 - loss: 0.5774 - val_accuracy: 0.7094 - val_loss: 0.5971
 Epoch 72/500
 10/10 0s 10ms/step -
 accuracy: 0.6985 - loss: 0.6141 - val_accuracy: 0.7094 - val_loss: 0.5969
 Epoch 73/500
 10/10 0s 8ms/step -
 accuracy: 0.7054 - loss: 0.6035 - val_accuracy: 0.7094 - val_loss: 0.5967
 Epoch 74/500
 10/10 0s 8ms/step -
 accuracy: 0.7136 - loss: 0.6015 - val_accuracy: 0.7094 - val_loss: 0.5966
 Epoch 75/500
 10/10 0s 8ms/step -
 accuracy: 0.6918 - loss: 0.6135 - val_accuracy: 0.7094 - val_loss: 0.5964
 Epoch 76/500
 10/10 0s 9ms/step -
 accuracy: 0.7157 - loss: 0.5969 - val_accuracy: 0.7094 - val_loss: 0.5962
 Epoch 77/500
 10/10 0s 10ms/step -
 accuracy: 0.7247 - loss: 0.5861 - val_accuracy: 0.7094 - val_loss: 0.5960
 Epoch 78/500
 10/10 0s 12ms/step -
 accuracy: 0.7516 - loss: 0.5656 - val_accuracy: 0.7094 - val_loss: 0.5958
 Epoch 79/500
 10/10 0s 17ms/step -
 accuracy: 0.7102 - loss: 0.6012 - val_accuracy: 0.7094 - val_loss: 0.5957
 Epoch 80/500
 10/10 0s 8ms/step -
 accuracy: 0.7183 - loss: 0.5908 - val_accuracy: 0.7094 - val_loss: 0.5955
 Epoch 81/500

10/10 0s 11ms/step -
 accuracy: 0.7166 - loss: 0.5934 - val_accuracy: 0.7094 - val_loss: 0.5953
 Epoch 82/500
 10/10 0s 10ms/step -
 accuracy: 0.7147 - loss: 0.5910 - val_accuracy: 0.7094 - val_loss: 0.5951
 Epoch 83/500
 10/10 0s 9ms/step -
 accuracy: 0.7038 - loss: 0.6074 - val_accuracy: 0.7094 - val_loss: 0.5950
 Epoch 84/500
 10/10 0s 14ms/step -
 accuracy: 0.6899 - loss: 0.6126 - val_accuracy: 0.7094 - val_loss: 0.5948
 Epoch 85/500
 10/10 0s 8ms/step -
 accuracy: 0.6999 - loss: 0.6102 - val_accuracy: 0.7094 - val_loss: 0.5946
 Epoch 86/500
 10/10 0s 8ms/step -
 accuracy: 0.6960 - loss: 0.6105 - val_accuracy: 0.7094 - val_loss: 0.5945
 Epoch 87/500
 10/10 0s 7ms/step -
 accuracy: 0.7103 - loss: 0.5987 - val_accuracy: 0.7094 - val_loss: 0.5943
 Epoch 88/500
 10/10 0s 8ms/step -
 accuracy: 0.6866 - loss: 0.6173 - val_accuracy: 0.7094 - val_loss: 0.5941
 Epoch 89/500
 10/10 0s 9ms/step -
 accuracy: 0.7031 - loss: 0.6057 - val_accuracy: 0.7094 - val_loss: 0.5940
 Epoch 90/500
 10/10 0s 9ms/step -
 accuracy: 0.7358 - loss: 0.5748 - val_accuracy: 0.7094 - val_loss: 0.5938
 Epoch 91/500
 10/10 0s 9ms/step -
 accuracy: 0.7105 - loss: 0.5954 - val_accuracy: 0.7094 - val_loss: 0.5936
 Epoch 92/500
 10/10 0s 8ms/step -
 accuracy: 0.7120 - loss: 0.5865 - val_accuracy: 0.7094 - val_loss: 0.5935
 Epoch 93/500
 10/10 0s 9ms/step -
 accuracy: 0.7095 - loss: 0.5898 - val_accuracy: 0.7094 - val_loss: 0.5933
 Epoch 94/500
 10/10 0s 14ms/step -
 accuracy: 0.7193 - loss: 0.5903 - val_accuracy: 0.7094 - val_loss: 0.5931
 Epoch 95/500
 10/10 0s 8ms/step -
 accuracy: 0.7119 - loss: 0.5932 - val_accuracy: 0.7094 - val_loss: 0.5930
 Epoch 96/500
 10/10 0s 8ms/step -
 accuracy: 0.7240 - loss: 0.5853 - val_accuracy: 0.7094 - val_loss: 0.5928
 Epoch 97/500

10/10 0s 8ms/step -
 accuracy: 0.7016 - loss: 0.6049 - val_accuracy: 0.7094 - val_loss: 0.5926
 Epoch 98/500
 10/10 0s 10ms/step -
 accuracy: 0.7160 - loss: 0.5912 - val_accuracy: 0.7094 - val_loss: 0.5925
 Epoch 99/500
 10/10 0s 9ms/step -
 accuracy: 0.6945 - loss: 0.6081 - val_accuracy: 0.7094 - val_loss: 0.5923
 Epoch 100/500
 10/10 0s 8ms/step -
 accuracy: 0.6899 - loss: 0.6151 - val_accuracy: 0.7094 - val_loss: 0.5921
 Epoch 101/500
 10/10 0s 8ms/step -
 accuracy: 0.7071 - loss: 0.5940 - val_accuracy: 0.7094 - val_loss: 0.5920
 Epoch 102/500
 10/10 0s 9ms/step -
 accuracy: 0.7398 - loss: 0.5664 - val_accuracy: 0.7094 - val_loss: 0.5918
 Epoch 103/500
 10/10 0s 8ms/step -
 accuracy: 0.7156 - loss: 0.5929 - val_accuracy: 0.7094 - val_loss: 0.5917
 Epoch 104/500
 10/10 0s 9ms/step -
 accuracy: 0.7048 - loss: 0.6032 - val_accuracy: 0.7094 - val_loss: 0.5915
 Epoch 105/500
 10/10 0s 8ms/step -
 accuracy: 0.7082 - loss: 0.5949 - val_accuracy: 0.7094 - val_loss: 0.5914
 Epoch 106/500
 10/10 0s 9ms/step -
 accuracy: 0.7360 - loss: 0.5725 - val_accuracy: 0.7094 - val_loss: 0.5912
 Epoch 107/500
 10/10 0s 9ms/step -
 accuracy: 0.7153 - loss: 0.5899 - val_accuracy: 0.7094 - val_loss: 0.5911
 Epoch 108/500
 10/10 0s 13ms/step -
 accuracy: 0.7127 - loss: 0.5938 - val_accuracy: 0.7094 - val_loss: 0.5909
 Epoch 109/500
 10/10 0s 8ms/step -
 accuracy: 0.7289 - loss: 0.5756 - val_accuracy: 0.7094 - val_loss: 0.5907
 Epoch 110/500
 10/10 0s 8ms/step -
 accuracy: 0.7334 - loss: 0.5805 - val_accuracy: 0.7094 - val_loss: 0.5906
 Epoch 111/500
 10/10 0s 8ms/step -
 accuracy: 0.6983 - loss: 0.6074 - val_accuracy: 0.7094 - val_loss: 0.5904
 Epoch 112/500
 10/10 0s 9ms/step -
 accuracy: 0.7180 - loss: 0.5874 - val_accuracy: 0.7094 - val_loss: 0.5903
 Epoch 113/500

10/10 0s 9ms/step -
 accuracy: 0.7183 - loss: 0.5874 - val_accuracy: 0.7094 - val_loss: 0.5901
 Epoch 114/500
 10/10 0s 9ms/step -
 accuracy: 0.6980 - loss: 0.6033 - val_accuracy: 0.7094 - val_loss: 0.5900
 Epoch 115/500
 10/10 0s 9ms/step -
 accuracy: 0.7220 - loss: 0.5852 - val_accuracy: 0.7094 - val_loss: 0.5898
 Epoch 116/500
 10/10 0s 8ms/step -
 accuracy: 0.7195 - loss: 0.5761 - val_accuracy: 0.7094 - val_loss: 0.5897
 Epoch 117/500
 10/10 0s 8ms/step -
 accuracy: 0.6934 - loss: 0.6019 - val_accuracy: 0.7094 - val_loss: 0.5896
 Epoch 118/500
 10/10 0s 8ms/step -
 accuracy: 0.7383 - loss: 0.5677 - val_accuracy: 0.7094 - val_loss: 0.5894
 Epoch 119/500
 10/10 0s 13ms/step -
 accuracy: 0.7156 - loss: 0.5884 - val_accuracy: 0.7094 - val_loss: 0.5893
 Epoch 120/500
 10/10 0s 8ms/step -
 accuracy: 0.6966 - loss: 0.6009 - val_accuracy: 0.7094 - val_loss: 0.5891
 Epoch 121/500
 10/10 0s 11ms/step -
 accuracy: 0.7160 - loss: 0.5926 - val_accuracy: 0.7094 - val_loss: 0.5890
 Epoch 122/500
 10/10 0s 8ms/step -
 accuracy: 0.7363 - loss: 0.5722 - val_accuracy: 0.7094 - val_loss: 0.5888
 Epoch 123/500
 10/10 0s 8ms/step -
 accuracy: 0.7046 - loss: 0.6007 - val_accuracy: 0.7094 - val_loss: 0.5887
 Epoch 124/500
 10/10 0s 9ms/step -
 accuracy: 0.7163 - loss: 0.5843 - val_accuracy: 0.7094 - val_loss: 0.5885
 Epoch 125/500
 10/10 0s 8ms/step -
 accuracy: 0.6983 - loss: 0.6039 - val_accuracy: 0.7094 - val_loss: 0.5884
 Epoch 126/500
 10/10 0s 8ms/step -
 accuracy: 0.7002 - loss: 0.6042 - val_accuracy: 0.7094 - val_loss: 0.5883
 Epoch 127/500
 10/10 0s 9ms/step -
 accuracy: 0.7128 - loss: 0.5969 - val_accuracy: 0.7094 - val_loss: 0.5881
 Epoch 128/500
 10/10 0s 9ms/step -
 accuracy: 0.7167 - loss: 0.5865 - val_accuracy: 0.7094 - val_loss: 0.5880
 Epoch 129/500

10/10 0s 9ms/step -
 accuracy: 0.7176 - loss: 0.5811 - val_accuracy: 0.7094 - val_loss: 0.5878
 Epoch 130/500
 10/10 0s 8ms/step -
 accuracy: 0.7007 - loss: 0.5966 - val_accuracy: 0.7094 - val_loss: 0.5877
 Epoch 131/500
 10/10 0s 10ms/step -
 accuracy: 0.6968 - loss: 0.6030 - val_accuracy: 0.7094 - val_loss: 0.5875
 Epoch 132/500
 10/10 0s 9ms/step -
 accuracy: 0.7025 - loss: 0.5995 - val_accuracy: 0.7094 - val_loss: 0.5874
 Epoch 133/500
 10/10 0s 13ms/step -
 accuracy: 0.6973 - loss: 0.6020 - val_accuracy: 0.7094 - val_loss: 0.5873
 Epoch 134/500
 10/10 0s 10ms/step -
 accuracy: 0.7032 - loss: 0.5954 - val_accuracy: 0.7094 - val_loss: 0.5871
 Epoch 135/500
 10/10 0s 9ms/step -
 accuracy: 0.7199 - loss: 0.5842 - val_accuracy: 0.7094 - val_loss: 0.5870
 Epoch 136/500
 10/10 0s 10ms/step -
 accuracy: 0.7065 - loss: 0.5945 - val_accuracy: 0.7094 - val_loss: 0.5868
 Epoch 137/500
 10/10 0s 9ms/step -
 accuracy: 0.7136 - loss: 0.5844 - val_accuracy: 0.7094 - val_loss: 0.5867
 Epoch 138/500
 10/10 0s 9ms/step -
 accuracy: 0.7022 - loss: 0.5988 - val_accuracy: 0.7094 - val_loss: 0.5866
 Epoch 139/500
 10/10 0s 9ms/step -
 accuracy: 0.7022 - loss: 0.5986 - val_accuracy: 0.7094 - val_loss: 0.5864
 Epoch 140/500
 10/10 0s 9ms/step -
 accuracy: 0.7315 - loss: 0.5702 - val_accuracy: 0.7094 - val_loss: 0.5863
 Epoch 141/500
 10/10 0s 9ms/step -
 accuracy: 0.7161 - loss: 0.5845 - val_accuracy: 0.7094 - val_loss: 0.5861
 Epoch 142/500
 10/10 0s 8ms/step -
 accuracy: 0.7266 - loss: 0.5751 - val_accuracy: 0.7094 - val_loss: 0.5860
 Epoch 143/500
 10/10 0s 9ms/step -
 accuracy: 0.7349 - loss: 0.5665 - val_accuracy: 0.7094 - val_loss: 0.5859
 Epoch 144/500
 10/10 0s 13ms/step -
 accuracy: 0.7220 - loss: 0.5779 - val_accuracy: 0.7094 - val_loss: 0.5857
 Epoch 145/500

10/10 0s 9ms/step -
 accuracy: 0.7198 - loss: 0.5805 - val_accuracy: 0.7094 - val_loss: 0.5856
 Epoch 146/500
 10/10 0s 8ms/step -
 accuracy: 0.6932 - loss: 0.6059 - val_accuracy: 0.7094 - val_loss: 0.5855
 Epoch 147/500
 10/10 0s 8ms/step -
 accuracy: 0.7020 - loss: 0.5950 - val_accuracy: 0.7094 - val_loss: 0.5853
 Epoch 148/500
 10/10 0s 8ms/step -
 accuracy: 0.7200 - loss: 0.5824 - val_accuracy: 0.7094 - val_loss: 0.5852
 Epoch 149/500
 10/10 0s 8ms/step -
 accuracy: 0.7181 - loss: 0.5796 - val_accuracy: 0.7094 - val_loss: 0.5851
 Epoch 150/500
 10/10 0s 8ms/step -
 accuracy: 0.7189 - loss: 0.5868 - val_accuracy: 0.7094 - val_loss: 0.5849
 Epoch 151/500
 10/10 0s 12ms/step -
 accuracy: 0.7126 - loss: 0.5827 - val_accuracy: 0.7094 - val_loss: 0.5848
 Epoch 152/500
 10/10 0s 9ms/step -
 accuracy: 0.7163 - loss: 0.5823 - val_accuracy: 0.7094 - val_loss: 0.5847
 Epoch 153/500
 10/10 0s 11ms/step -
 accuracy: 0.7215 - loss: 0.5828 - val_accuracy: 0.7094 - val_loss: 0.5845
 Epoch 154/500
 10/10 0s 14ms/step -
 accuracy: 0.7213 - loss: 0.5832 - val_accuracy: 0.7094 - val_loss: 0.5844
 Epoch 155/500
 10/10 0s 8ms/step -
 accuracy: 0.6950 - loss: 0.6004 - val_accuracy: 0.7094 - val_loss: 0.5843
 Epoch 156/500
 10/10 0s 8ms/step -
 accuracy: 0.7251 - loss: 0.5673 - val_accuracy: 0.7094 - val_loss: 0.5841
 Epoch 157/500
 10/10 0s 8ms/step -
 accuracy: 0.7421 - loss: 0.5556 - val_accuracy: 0.7094 - val_loss: 0.5840
 Epoch 158/500
 10/10 0s 8ms/step -
 accuracy: 0.7190 - loss: 0.5809 - val_accuracy: 0.7094 - val_loss: 0.5839
 Epoch 159/500
 10/10 0s 8ms/step -
 accuracy: 0.7292 - loss: 0.5756 - val_accuracy: 0.7094 - val_loss: 0.5838
 Epoch 160/500
 10/10 0s 8ms/step -
 accuracy: 0.7398 - loss: 0.5598 - val_accuracy: 0.7094 - val_loss: 0.5836
 Epoch 161/500

10/10 0s 8ms/step -
 accuracy: 0.7132 - loss: 0.5822 - val_accuracy: 0.7094 - val_loss: 0.5835
 Epoch 162/500
 10/10 0s 8ms/step -
 accuracy: 0.7293 - loss: 0.5660 - val_accuracy: 0.7094 - val_loss: 0.5834
 Epoch 163/500
 10/10 0s 12ms/step -
 accuracy: 0.7123 - loss: 0.5800 - val_accuracy: 0.7094 - val_loss: 0.5833
 Epoch 164/500
 10/10 0s 8ms/step -
 accuracy: 0.7186 - loss: 0.5807 - val_accuracy: 0.7094 - val_loss: 0.5831
 Epoch 165/500
 10/10 0s 8ms/step -
 accuracy: 0.7422 - loss: 0.5558 - val_accuracy: 0.7094 - val_loss: 0.5830
 Epoch 166/500
 10/10 0s 8ms/step -
 accuracy: 0.7210 - loss: 0.5763 - val_accuracy: 0.7094 - val_loss: 0.5829
 Epoch 167/500
 10/10 0s 8ms/step -
 accuracy: 0.7374 - loss: 0.5694 - val_accuracy: 0.7094 - val_loss: 0.5828
 Epoch 168/500
 10/10 0s 8ms/step -
 accuracy: 0.6908 - loss: 0.5945 - val_accuracy: 0.7094 - val_loss: 0.5826
 Epoch 169/500
 10/10 0s 9ms/step -
 accuracy: 0.7364 - loss: 0.5681 - val_accuracy: 0.7094 - val_loss: 0.5825
 Epoch 170/500
 10/10 0s 12ms/step -
 accuracy: 0.7119 - loss: 0.5831 - val_accuracy: 0.7094 - val_loss: 0.5824
 Epoch 171/500
 10/10 0s 20ms/step -
 accuracy: 0.7230 - loss: 0.5757 - val_accuracy: 0.7094 - val_loss: 0.5823
 Epoch 172/500
 10/10 0s 20ms/step -
 accuracy: 0.6971 - loss: 0.5916 - val_accuracy: 0.7094 - val_loss: 0.5821
 Epoch 173/500
 10/10 0s 12ms/step -
 accuracy: 0.6898 - loss: 0.6015 - val_accuracy: 0.7094 - val_loss: 0.5820
 Epoch 174/500
 10/10 0s 9ms/step -
 accuracy: 0.7259 - loss: 0.5723 - val_accuracy: 0.7094 - val_loss: 0.5819
 Epoch 175/500
 10/10 0s 8ms/step -
 accuracy: 0.7194 - loss: 0.5793 - val_accuracy: 0.7094 - val_loss: 0.5818
 Epoch 176/500
 10/10 0s 8ms/step -
 accuracy: 0.7250 - loss: 0.5738 - val_accuracy: 0.7094 - val_loss: 0.5817
 Epoch 177/500

10/10 0s 7ms/step -
 accuracy: 0.7175 - loss: 0.5843 - val_accuracy: 0.7094 - val_loss: 0.5816
 Epoch 178/500
 10/10 0s 8ms/step -
 accuracy: 0.6963 - loss: 0.5958 - val_accuracy: 0.7094 - val_loss: 0.5815
 Epoch 179/500
 10/10 0s 9ms/step -
 accuracy: 0.7194 - loss: 0.5759 - val_accuracy: 0.7094 - val_loss: 0.5813
 Epoch 180/500
 10/10 0s 7ms/step -
 accuracy: 0.7203 - loss: 0.5752 - val_accuracy: 0.7094 - val_loss: 0.5812
 Epoch 181/500
 10/10 0s 7ms/step -
 accuracy: 0.7111 - loss: 0.5825 - val_accuracy: 0.7094 - val_loss: 0.5811
 Epoch 182/500
 10/10 0s 7ms/step -
 accuracy: 0.7007 - loss: 0.5879 - val_accuracy: 0.7094 - val_loss: 0.5810
 Epoch 183/500
 10/10 0s 9ms/step -
 accuracy: 0.6958 - loss: 0.5967 - val_accuracy: 0.7094 - val_loss: 0.5809
 Epoch 184/500
 10/10 0s 8ms/step -
 accuracy: 0.7348 - loss: 0.5600 - val_accuracy: 0.7094 - val_loss: 0.5807
 Epoch 185/500
 10/10 0s 7ms/step -
 accuracy: 0.7065 - loss: 0.5862 - val_accuracy: 0.7094 - val_loss: 0.5806
 Epoch 186/500
 10/10 0s 8ms/step -
 accuracy: 0.7161 - loss: 0.5761 - val_accuracy: 0.7094 - val_loss: 0.5805
 Epoch 187/500
 10/10 0s 8ms/step -
 accuracy: 0.7028 - loss: 0.5877 - val_accuracy: 0.7094 - val_loss: 0.5804
 Epoch 188/500
 10/10 0s 9ms/step -
 accuracy: 0.7176 - loss: 0.5765 - val_accuracy: 0.7094 - val_loss: 0.5803
 Epoch 189/500
 10/10 0s 8ms/step -
 accuracy: 0.7167 - loss: 0.5758 - val_accuracy: 0.7094 - val_loss: 0.5802
 Epoch 190/500
 10/10 0s 8ms/step -
 accuracy: 0.7104 - loss: 0.5782 - val_accuracy: 0.7094 - val_loss: 0.5800
 Epoch 191/500
 10/10 0s 8ms/step -
 accuracy: 0.7110 - loss: 0.5841 - val_accuracy: 0.7094 - val_loss: 0.5799
 Epoch 192/500
 10/10 0s 9ms/step -
 accuracy: 0.6938 - loss: 0.5945 - val_accuracy: 0.7094 - val_loss: 0.5798
 Epoch 193/500

10/10 0s 8ms/step -
 accuracy: 0.7240 - loss: 0.5714 - val_accuracy: 0.7094 - val_loss: 0.5797
 Epoch 194/500
 10/10 0s 8ms/step -
 accuracy: 0.7039 - loss: 0.5886 - val_accuracy: 0.7094 - val_loss: 0.5796
 Epoch 195/500
 10/10 0s 7ms/step -
 accuracy: 0.7088 - loss: 0.5814 - val_accuracy: 0.7094 - val_loss: 0.5795
 Epoch 196/500
 10/10 0s 7ms/step -
 accuracy: 0.7231 - loss: 0.5734 - val_accuracy: 0.7094 - val_loss: 0.5794
 Epoch 197/500
 10/10 0s 13ms/step -
 accuracy: 0.7069 - loss: 0.5912 - val_accuracy: 0.7094 - val_loss: 0.5793
 Epoch 198/500
 10/10 0s 7ms/step -
 accuracy: 0.7483 - loss: 0.5495 - val_accuracy: 0.7094 - val_loss: 0.5791
 Epoch 199/500
 10/10 0s 7ms/step -
 accuracy: 0.6964 - loss: 0.5938 - val_accuracy: 0.7094 - val_loss: 0.5790
 Epoch 200/500
 10/10 0s 7ms/step -
 accuracy: 0.7121 - loss: 0.5793 - val_accuracy: 0.7094 - val_loss: 0.5789
 Epoch 201/500
 10/10 0s 7ms/step -
 accuracy: 0.6919 - loss: 0.5943 - val_accuracy: 0.7094 - val_loss: 0.5788
 Epoch 202/500
 10/10 0s 7ms/step -
 accuracy: 0.7262 - loss: 0.5693 - val_accuracy: 0.7094 - val_loss: 0.5787
 Epoch 203/500
 10/10 0s 8ms/step -
 accuracy: 0.7009 - loss: 0.5918 - val_accuracy: 0.7094 - val_loss: 0.5786
 Epoch 204/500
 10/10 0s 8ms/step -
 accuracy: 0.7316 - loss: 0.5613 - val_accuracy: 0.7094 - val_loss: 0.5785
 Epoch 205/500
 10/10 0s 8ms/step -
 accuracy: 0.6982 - loss: 0.5896 - val_accuracy: 0.7094 - val_loss: 0.5784
 Epoch 206/500
 10/10 0s 8ms/step -
 accuracy: 0.7189 - loss: 0.5746 - val_accuracy: 0.7094 - val_loss: 0.5783
 Epoch 207/500
 10/10 0s 8ms/step -
 accuracy: 0.6932 - loss: 0.5986 - val_accuracy: 0.7094 - val_loss: 0.5782
 Epoch 208/500
 10/10 0s 8ms/step -
 accuracy: 0.6975 - loss: 0.5960 - val_accuracy: 0.7094 - val_loss: 0.5781
 Epoch 209/500

10/10 0s 10ms/step -
 accuracy: 0.7145 - loss: 0.5756 - val_accuracy: 0.7094 - val_loss: 0.5779
 Epoch 210/500
 10/10 0s 7ms/step -
 accuracy: 0.7277 - loss: 0.5691 - val_accuracy: 0.7094 - val_loss: 0.5778
 Epoch 211/500
 10/10 0s 7ms/step -
 accuracy: 0.7148 - loss: 0.5780 - val_accuracy: 0.7094 - val_loss: 0.5777
 Epoch 212/500
 10/10 0s 7ms/step -
 accuracy: 0.7097 - loss: 0.5829 - val_accuracy: 0.7094 - val_loss: 0.5776
 Epoch 213/500
 10/10 0s 8ms/step -
 accuracy: 0.7321 - loss: 0.5659 - val_accuracy: 0.7094 - val_loss: 0.5775
 Epoch 214/500
 10/10 0s 8ms/step -
 accuracy: 0.7144 - loss: 0.5784 - val_accuracy: 0.7094 - val_loss: 0.5774
 Epoch 215/500
 10/10 0s 8ms/step -
 accuracy: 0.7276 - loss: 0.5671 - val_accuracy: 0.7094 - val_loss: 0.5773
 Epoch 216/500
 10/10 0s 7ms/step -
 accuracy: 0.7264 - loss: 0.5687 - val_accuracy: 0.7094 - val_loss: 0.5772
 Epoch 217/500
 10/10 0s 7ms/step -
 accuracy: 0.7345 - loss: 0.5618 - val_accuracy: 0.7094 - val_loss: 0.5771
 Epoch 218/500
 10/10 0s 8ms/step -
 accuracy: 0.7031 - loss: 0.5859 - val_accuracy: 0.7094 - val_loss: 0.5770
 Epoch 219/500
 10/10 0s 8ms/step -
 accuracy: 0.7354 - loss: 0.5596 - val_accuracy: 0.7094 - val_loss: 0.5769
 Epoch 220/500
 10/10 0s 7ms/step -
 accuracy: 0.7189 - loss: 0.5715 - val_accuracy: 0.7094 - val_loss: 0.5768
 Epoch 221/500
 10/10 0s 7ms/step -
 accuracy: 0.7043 - loss: 0.5863 - val_accuracy: 0.7094 - val_loss: 0.5767
 Epoch 222/500
 10/10 0s 7ms/step -
 accuracy: 0.7054 - loss: 0.5869 - val_accuracy: 0.7094 - val_loss: 0.5766
 Epoch 223/500
 10/10 0s 7ms/step -
 accuracy: 0.6980 - loss: 0.5841 - val_accuracy: 0.7094 - val_loss: 0.5765
 Epoch 224/500
 10/10 0s 8ms/step -
 accuracy: 0.7044 - loss: 0.5821 - val_accuracy: 0.7094 - val_loss: 0.5764
 Epoch 225/500

10/10 0s 8ms/step -
 accuracy: 0.7369 - loss: 0.5559 - val_accuracy: 0.7094 - val_loss: 0.5763
 Epoch 226/500
 10/10 0s 7ms/step -
 accuracy: 0.7223 - loss: 0.5688 - val_accuracy: 0.7094 - val_loss: 0.5762
 Epoch 227/500
 10/10 0s 7ms/step -
 accuracy: 0.7429 - loss: 0.5482 - val_accuracy: 0.7094 - val_loss: 0.5761
 Epoch 228/500
 10/10 0s 9ms/step -
 accuracy: 0.7063 - loss: 0.5848 - val_accuracy: 0.7094 - val_loss: 0.5760
 Epoch 229/500
 10/10 0s 8ms/step -
 accuracy: 0.7243 - loss: 0.5588 - val_accuracy: 0.7094 - val_loss: 0.5759
 Epoch 230/500
 10/10 0s 9ms/step -
 accuracy: 0.7207 - loss: 0.5673 - val_accuracy: 0.7094 - val_loss: 0.5758
 Epoch 231/500
 10/10 0s 8ms/step -
 accuracy: 0.6980 - loss: 0.5870 - val_accuracy: 0.7094 - val_loss: 0.5757
 Epoch 232/500
 10/10 0s 9ms/step -
 accuracy: 0.7136 - loss: 0.5755 - val_accuracy: 0.7094 - val_loss: 0.5756
 Epoch 233/500
 10/10 0s 7ms/step -
 accuracy: 0.7245 - loss: 0.5614 - val_accuracy: 0.7094 - val_loss: 0.5755
 Epoch 234/500
 10/10 0s 7ms/step -
 accuracy: 0.7219 - loss: 0.5656 - val_accuracy: 0.7094 - val_loss: 0.5754
 Epoch 235/500
 10/10 0s 8ms/step -
 accuracy: 0.6682 - loss: 0.6196 - val_accuracy: 0.7094 - val_loss: 0.5753
 Epoch 236/500
 10/10 0s 7ms/step -
 accuracy: 0.7073 - loss: 0.5856 - val_accuracy: 0.7094 - val_loss: 0.5752
 Epoch 237/500
 10/10 0s 12ms/step -
 accuracy: 0.7150 - loss: 0.5689 - val_accuracy: 0.7094 - val_loss: 0.5751
 Epoch 238/500
 10/10 0s 8ms/step -
 accuracy: 0.7154 - loss: 0.5782 - val_accuracy: 0.7094 - val_loss: 0.5750
 Epoch 239/500
 10/10 0s 10ms/step -
 accuracy: 0.7225 - loss: 0.5708 - val_accuracy: 0.7094 - val_loss: 0.5749
 Epoch 240/500
 10/10 0s 8ms/step -
 accuracy: 0.7219 - loss: 0.5684 - val_accuracy: 0.7094 - val_loss: 0.5748
 Epoch 241/500

10/10 0s 7ms/step -
 accuracy: 0.7006 - loss: 0.5861 - val_accuracy: 0.7094 - val_loss: 0.5748
 Epoch 242/500
 10/10 0s 8ms/step -
 accuracy: 0.7113 - loss: 0.5735 - val_accuracy: 0.7094 - val_loss: 0.5747
 Epoch 243/500
 10/10 0s 8ms/step -
 accuracy: 0.7080 - loss: 0.5810 - val_accuracy: 0.7094 - val_loss: 0.5746
 Epoch 244/500
 10/10 0s 8ms/step -
 accuracy: 0.7210 - loss: 0.5647 - val_accuracy: 0.7094 - val_loss: 0.5745
 Epoch 245/500
 10/10 0s 8ms/step -
 accuracy: 0.7261 - loss: 0.5652 - val_accuracy: 0.7094 - val_loss: 0.5744
 Epoch 246/500
 10/10 0s 8ms/step -
 accuracy: 0.6959 - loss: 0.5863 - val_accuracy: 0.7094 - val_loss: 0.5743
 Epoch 247/500
 10/10 0s 7ms/step -
 accuracy: 0.7013 - loss: 0.5877 - val_accuracy: 0.7094 - val_loss: 0.5742
 Epoch 248/500
 10/10 0s 7ms/step -
 accuracy: 0.6999 - loss: 0.5924 - val_accuracy: 0.7094 - val_loss: 0.5741
 Epoch 249/500
 10/10 0s 9ms/step -
 accuracy: 0.7240 - loss: 0.5650 - val_accuracy: 0.7094 - val_loss: 0.5740
 Epoch 250/500
 10/10 0s 7ms/step -
 accuracy: 0.7034 - loss: 0.5845 - val_accuracy: 0.7094 - val_loss: 0.5739
 Epoch 251/500
 10/10 0s 7ms/step -
 accuracy: 0.7168 - loss: 0.5676 - val_accuracy: 0.7094 - val_loss: 0.5738
 Epoch 252/500
 10/10 0s 7ms/step -
 accuracy: 0.7267 - loss: 0.5630 - val_accuracy: 0.7094 - val_loss: 0.5737
 Epoch 253/500
 10/10 0s 7ms/step -
 accuracy: 0.7025 - loss: 0.5835 - val_accuracy: 0.7094 - val_loss: 0.5736
 Epoch 254/500
 10/10 0s 7ms/step -
 accuracy: 0.7128 - loss: 0.5792 - val_accuracy: 0.7094 - val_loss: 0.5735
 Epoch 255/500
 10/10 0s 7ms/step -
 accuracy: 0.7157 - loss: 0.5707 - val_accuracy: 0.7094 - val_loss: 0.5734
 Epoch 256/500
 10/10 0s 8ms/step -
 accuracy: 0.7202 - loss: 0.5699 - val_accuracy: 0.7094 - val_loss: 0.5734
 Epoch 257/500

10/10 0s 7ms/step -
 accuracy: 0.7290 - loss: 0.5614 - val_accuracy: 0.7094 - val_loss: 0.5733
 Epoch 258/500
 10/10 0s 7ms/step -
 accuracy: 0.7072 - loss: 0.5692 - val_accuracy: 0.7094 - val_loss: 0.5732
 Epoch 259/500
 10/10 0s 13ms/step -
 accuracy: 0.7040 - loss: 0.5780 - val_accuracy: 0.7094 - val_loss: 0.5731
 Epoch 260/500
 10/10 0s 8ms/step -
 accuracy: 0.6989 - loss: 0.5840 - val_accuracy: 0.7094 - val_loss: 0.5730
 Epoch 261/500
 10/10 0s 8ms/step -
 accuracy: 0.7235 - loss: 0.5619 - val_accuracy: 0.7094 - val_loss: 0.5729
 Epoch 262/500
 10/10 0s 8ms/step -
 accuracy: 0.7055 - loss: 0.5793 - val_accuracy: 0.7094 - val_loss: 0.5728
 Epoch 263/500
 10/10 0s 7ms/step -
 accuracy: 0.7142 - loss: 0.5723 - val_accuracy: 0.7094 - val_loss: 0.5727
 Epoch 264/500
 10/10 0s 8ms/step -
 accuracy: 0.7077 - loss: 0.5755 - val_accuracy: 0.7094 - val_loss: 0.5726
 Epoch 265/500
 10/10 0s 8ms/step -
 accuracy: 0.7269 - loss: 0.5610 - val_accuracy: 0.7094 - val_loss: 0.5726
 Epoch 266/500
 10/10 0s 8ms/step -
 accuracy: 0.7017 - loss: 0.5823 - val_accuracy: 0.7094 - val_loss: 0.5725
 Epoch 267/500
 10/10 0s 9ms/step -
 accuracy: 0.7414 - loss: 0.5491 - val_accuracy: 0.7094 - val_loss: 0.5724
 Epoch 268/500
 10/10 0s 9ms/step -
 accuracy: 0.7291 - loss: 0.5564 - val_accuracy: 0.7094 - val_loss: 0.5723
 Epoch 269/500
 10/10 0s 8ms/step -
 accuracy: 0.7179 - loss: 0.5655 - val_accuracy: 0.7094 - val_loss: 0.5722
 Epoch 270/500
 10/10 0s 7ms/step -
 accuracy: 0.7141 - loss: 0.5697 - val_accuracy: 0.7094 - val_loss: 0.5721
 Epoch 271/500
 10/10 0s 9ms/step -
 accuracy: 0.7079 - loss: 0.5789 - val_accuracy: 0.7094 - val_loss: 0.5720
 Epoch 272/500
 10/10 0s 8ms/step -
 accuracy: 0.7032 - loss: 0.5761 - val_accuracy: 0.7094 - val_loss: 0.5720
 Epoch 273/500

10/10 0s 8ms/step -
 accuracy: 0.6964 - loss: 0.5848 - val_accuracy: 0.7094 - val_loss: 0.5719
 Epoch 274/500
 10/10 0s 8ms/step -
 accuracy: 0.7143 - loss: 0.5684 - val_accuracy: 0.7094 - val_loss: 0.5718
 Epoch 275/500
 10/10 0s 9ms/step -
 accuracy: 0.7031 - loss: 0.5736 - val_accuracy: 0.7094 - val_loss: 0.5717
 Epoch 276/500
 10/10 0s 14ms/step -
 accuracy: 0.7125 - loss: 0.5760 - val_accuracy: 0.7094 - val_loss: 0.5716
 Epoch 277/500
 10/10 0s 7ms/step -
 accuracy: 0.7498 - loss: 0.5428 - val_accuracy: 0.7094 - val_loss: 0.5716
 Epoch 278/500
 10/10 0s 7ms/step -
 accuracy: 0.6991 - loss: 0.5758 - val_accuracy: 0.7094 - val_loss: 0.5715
 Epoch 279/500
 10/10 0s 14ms/step -
 accuracy: 0.7046 - loss: 0.5831 - val_accuracy: 0.7094 - val_loss: 0.5714
 Epoch 280/500
 10/10 0s 7ms/step -
 accuracy: 0.7170 - loss: 0.5685 - val_accuracy: 0.7094 - val_loss: 0.5713
 Epoch 281/500
 10/10 0s 8ms/step -
 accuracy: 0.6980 - loss: 0.5753 - val_accuracy: 0.7094 - val_loss: 0.5713
 Epoch 282/500
 10/10 0s 8ms/step -
 accuracy: 0.7015 - loss: 0.5763 - val_accuracy: 0.7094 - val_loss: 0.5712
 Epoch 283/500
 10/10 0s 8ms/step -
 accuracy: 0.7225 - loss: 0.5611 - val_accuracy: 0.7094 - val_loss: 0.5711
 Epoch 284/500
 10/10 0s 8ms/step -
 accuracy: 0.6906 - loss: 0.5877 - val_accuracy: 0.7094 - val_loss: 0.5710
 Epoch 285/500
 10/10 0s 9ms/step -
 accuracy: 0.7101 - loss: 0.5735 - val_accuracy: 0.7094 - val_loss: 0.5709
 Epoch 286/500
 10/10 0s 10ms/step -
 accuracy: 0.7151 - loss: 0.5667 - val_accuracy: 0.7094 - val_loss: 0.5709
 Epoch 287/500
 10/10 0s 8ms/step -
 accuracy: 0.7077 - loss: 0.5761 - val_accuracy: 0.7094 - val_loss: 0.5708
 Epoch 288/500
 10/10 0s 8ms/step -
 accuracy: 0.7154 - loss: 0.5653 - val_accuracy: 0.7094 - val_loss: 0.5707
 Epoch 289/500

10/10 0s 7ms/step -
 accuracy: 0.7142 - loss: 0.5707 - val_accuracy: 0.7094 - val_loss: 0.5706
 Epoch 290/500
 10/10 0s 8ms/step -
 accuracy: 0.7057 - loss: 0.5796 - val_accuracy: 0.7094 - val_loss: 0.5705
 Epoch 291/500
 10/10 0s 7ms/step -
 accuracy: 0.7059 - loss: 0.5740 - val_accuracy: 0.7094 - val_loss: 0.5705
 Epoch 292/500
 10/10 0s 8ms/step -
 accuracy: 0.7137 - loss: 0.5694 - val_accuracy: 0.7094 - val_loss: 0.5704
 Epoch 293/500
 10/10 0s 8ms/step -
 accuracy: 0.7301 - loss: 0.5468 - val_accuracy: 0.7094 - val_loss: 0.5703
 Epoch 294/500
 10/10 0s 7ms/step -
 accuracy: 0.7070 - loss: 0.5812 - val_accuracy: 0.7094 - val_loss: 0.5703
 Epoch 295/500
 10/10 0s 7ms/step -
 accuracy: 0.7289 - loss: 0.5544 - val_accuracy: 0.7094 - val_loss: 0.5702
 Epoch 296/500
 10/10 0s 8ms/step -
 accuracy: 0.6951 - loss: 0.5857 - val_accuracy: 0.7094 - val_loss: 0.5701
 Epoch 297/500
 10/10 0s 8ms/step -
 accuracy: 0.7335 - loss: 0.5511 - val_accuracy: 0.7094 - val_loss: 0.5700
 Epoch 298/500
 10/10 0s 8ms/step -
 accuracy: 0.7186 - loss: 0.5650 - val_accuracy: 0.7094 - val_loss: 0.5699
 Epoch 299/500
 10/10 0s 8ms/step -
 accuracy: 0.7083 - loss: 0.5705 - val_accuracy: 0.7094 - val_loss: 0.5698
 Epoch 300/500
 10/10 0s 8ms/step -
 accuracy: 0.6945 - loss: 0.5815 - val_accuracy: 0.7094 - val_loss: 0.5698
 Epoch 301/500
 10/10 0s 10ms/step -
 accuracy: 0.7509 - loss: 0.5422 - val_accuracy: 0.7094 - val_loss: 0.5697
 Epoch 302/500
 10/10 0s 8ms/step -
 accuracy: 0.7020 - loss: 0.5757 - val_accuracy: 0.7094 - val_loss: 0.5696
 Epoch 303/500
 10/10 0s 8ms/step -
 accuracy: 0.7091 - loss: 0.5723 - val_accuracy: 0.7094 - val_loss: 0.5695
 Epoch 304/500
 10/10 0s 7ms/step -
 accuracy: 0.6954 - loss: 0.5816 - val_accuracy: 0.7094 - val_loss: 0.5695
 Epoch 305/500

10/10 0s 7ms/step -
 accuracy: 0.7206 - loss: 0.5601 - val_accuracy: 0.7094 - val_loss: 0.5694
 Epoch 306/500
 10/10 0s 8ms/step -
 accuracy: 0.7357 - loss: 0.5470 - val_accuracy: 0.7094 - val_loss: 0.5693
 Epoch 307/500
 10/10 0s 7ms/step -
 accuracy: 0.7131 - loss: 0.5754 - val_accuracy: 0.7094 - val_loss: 0.5692
 Epoch 308/500
 10/10 0s 8ms/step -
 accuracy: 0.6981 - loss: 0.5803 - val_accuracy: 0.7094 - val_loss: 0.5692
 Epoch 309/500
 10/10 0s 8ms/step -
 accuracy: 0.7199 - loss: 0.5626 - val_accuracy: 0.7094 - val_loss: 0.5691
 Epoch 310/500
 10/10 0s 8ms/step -
 accuracy: 0.7241 - loss: 0.5574 - val_accuracy: 0.7094 - val_loss: 0.5690
 Epoch 311/500
 10/10 0s 8ms/step -
 accuracy: 0.7278 - loss: 0.5603 - val_accuracy: 0.7094 - val_loss: 0.5689
 Epoch 312/500
 10/10 0s 8ms/step -
 accuracy: 0.7192 - loss: 0.5621 - val_accuracy: 0.7094 - val_loss: 0.5688
 Epoch 313/500
 10/10 0s 8ms/step -
 accuracy: 0.7257 - loss: 0.5609 - val_accuracy: 0.7094 - val_loss: 0.5688
 Epoch 314/500
 10/10 0s 8ms/step -
 accuracy: 0.7040 - loss: 0.5772 - val_accuracy: 0.7094 - val_loss: 0.5687
 Epoch 315/500
 10/10 0s 9ms/step -
 accuracy: 0.7219 - loss: 0.5635 - val_accuracy: 0.7094 - val_loss: 0.5686
 Epoch 316/500
 10/10 0s 7ms/step -
 accuracy: 0.7104 - loss: 0.5687 - val_accuracy: 0.7094 - val_loss: 0.5686
 Epoch 317/500
 10/10 0s 8ms/step -
 accuracy: 0.7152 - loss: 0.5668 - val_accuracy: 0.7094 - val_loss: 0.5685
 Epoch 318/500
 10/10 0s 8ms/step -
 accuracy: 0.7238 - loss: 0.5589 - val_accuracy: 0.7094 - val_loss: 0.5684
 Epoch 319/500
 10/10 0s 9ms/step -
 accuracy: 0.7136 - loss: 0.5655 - val_accuracy: 0.7094 - val_loss: 0.5683
 Epoch 320/500
 10/10 0s 8ms/step -
 accuracy: 0.6998 - loss: 0.5749 - val_accuracy: 0.7094 - val_loss: 0.5683
 Epoch 321/500

10/10 0s 8ms/step -
 accuracy: 0.7073 - loss: 0.5649 - val_accuracy: 0.7094 - val_loss: 0.5682
 Epoch 322/500
 10/10 0s 8ms/step -
 accuracy: 0.7316 - loss: 0.5529 - val_accuracy: 0.7094 - val_loss: 0.5681
 Epoch 323/500
 10/10 0s 10ms/step -
 accuracy: 0.7199 - loss: 0.5640 - val_accuracy: 0.7094 - val_loss: 0.5681
 Epoch 324/500
 10/10 0s 8ms/step -
 accuracy: 0.6980 - loss: 0.5751 - val_accuracy: 0.7094 - val_loss: 0.5680
 Epoch 325/500
 10/10 0s 7ms/step -
 accuracy: 0.7107 - loss: 0.5719 - val_accuracy: 0.7094 - val_loss: 0.5679
 Epoch 326/500
 10/10 0s 7ms/step -
 accuracy: 0.7385 - loss: 0.5412 - val_accuracy: 0.7094 - val_loss: 0.5679
 Epoch 327/500
 10/10 0s 7ms/step -
 accuracy: 0.7162 - loss: 0.5679 - val_accuracy: 0.7094 - val_loss: 0.5678
 Epoch 328/500
 10/10 0s 13ms/step -
 accuracy: 0.7262 - loss: 0.5495 - val_accuracy: 0.7094 - val_loss: 0.5677
 Epoch 329/500
 10/10 0s 7ms/step -
 accuracy: 0.7273 - loss: 0.5498 - val_accuracy: 0.7094 - val_loss: 0.5676
 Epoch 330/500
 10/10 0s 8ms/step -
 accuracy: 0.7224 - loss: 0.5578 - val_accuracy: 0.7094 - val_loss: 0.5675
 Epoch 331/500
 10/10 0s 7ms/step -
 accuracy: 0.6798 - loss: 0.5984 - val_accuracy: 0.7094 - val_loss: 0.5675
 Epoch 332/500
 10/10 0s 7ms/step -
 accuracy: 0.7169 - loss: 0.5644 - val_accuracy: 0.7094 - val_loss: 0.5674
 Epoch 333/500
 10/10 0s 7ms/step -
 accuracy: 0.7167 - loss: 0.5588 - val_accuracy: 0.7094 - val_loss: 0.5674
 Epoch 334/500
 10/10 0s 7ms/step -
 accuracy: 0.7036 - loss: 0.5730 - val_accuracy: 0.7094 - val_loss: 0.5673
 Epoch 335/500
 10/10 0s 7ms/step -
 accuracy: 0.7520 - loss: 0.5290 - val_accuracy: 0.7094 - val_loss: 0.5672
 Epoch 336/500
 10/10 0s 7ms/step -
 accuracy: 0.7130 - loss: 0.5684 - val_accuracy: 0.7094 - val_loss: 0.5671
 Epoch 337/500

10/10 0s 7ms/step -
 accuracy: 0.7122 - loss: 0.5635 - val_accuracy: 0.7094 - val_loss: 0.5671
 Epoch 338/500
 10/10 0s 7ms/step -
 accuracy: 0.7274 - loss: 0.5580 - val_accuracy: 0.7094 - val_loss: 0.5670
 Epoch 339/500
 10/10 0s 7ms/step -
 accuracy: 0.7236 - loss: 0.5547 - val_accuracy: 0.7094 - val_loss: 0.5669
 Epoch 340/500
 10/10 0s 8ms/step -
 accuracy: 0.7077 - loss: 0.5672 - val_accuracy: 0.7094 - val_loss: 0.5669
 Epoch 341/500
 10/10 0s 7ms/step -
 accuracy: 0.7157 - loss: 0.5635 - val_accuracy: 0.7094 - val_loss: 0.5668
 Epoch 342/500
 10/10 0s 8ms/step -
 accuracy: 0.7193 - loss: 0.5656 - val_accuracy: 0.7094 - val_loss: 0.5667
 Epoch 343/500
 10/10 0s 7ms/step -
 accuracy: 0.7134 - loss: 0.5606 - val_accuracy: 0.7094 - val_loss: 0.5667
 Epoch 344/500
 10/10 0s 7ms/step -
 accuracy: 0.6931 - loss: 0.5814 - val_accuracy: 0.7094 - val_loss: 0.5666
 Epoch 345/500
 10/10 0s 7ms/step -
 accuracy: 0.7295 - loss: 0.5483 - val_accuracy: 0.7094 - val_loss: 0.5665
 Epoch 346/500
 10/10 0s 12ms/step -
 accuracy: 0.7267 - loss: 0.5500 - val_accuracy: 0.7094 - val_loss: 0.5665
 Epoch 347/500
 10/10 0s 7ms/step -
 accuracy: 0.7313 - loss: 0.5460 - val_accuracy: 0.7094 - val_loss: 0.5664
 Epoch 348/500
 10/10 0s 7ms/step -
 accuracy: 0.7153 - loss: 0.5652 - val_accuracy: 0.7094 - val_loss: 0.5664
 Epoch 349/500
 10/10 0s 7ms/step -
 accuracy: 0.7303 - loss: 0.5487 - val_accuracy: 0.7094 - val_loss: 0.5663
 Epoch 350/500
 10/10 0s 7ms/step -
 accuracy: 0.7227 - loss: 0.5559 - val_accuracy: 0.7094 - val_loss: 0.5662
 Epoch 351/500
 10/10 0s 8ms/step -
 accuracy: 0.7064 - loss: 0.5716 - val_accuracy: 0.7094 - val_loss: 0.5661
 Epoch 352/500
 10/10 0s 7ms/step -
 accuracy: 0.6949 - loss: 0.5810 - val_accuracy: 0.7094 - val_loss: 0.5661
 Epoch 353/500

10/10 0s 8ms/step -
 accuracy: 0.7218 - loss: 0.5558 - val_accuracy: 0.7094 - val_loss: 0.5660
 Epoch 354/500
 10/10 0s 7ms/step -
 accuracy: 0.6975 - loss: 0.5767 - val_accuracy: 0.7094 - val_loss: 0.5659
 Epoch 355/500
 10/10 0s 7ms/step -
 accuracy: 0.6980 - loss: 0.5806 - val_accuracy: 0.7094 - val_loss: 0.5659
 Epoch 356/500
 10/10 0s 7ms/step -
 accuracy: 0.6967 - loss: 0.5769 - val_accuracy: 0.7094 - val_loss: 0.5658
 Epoch 357/500
 10/10 0s 7ms/step -
 accuracy: 0.7115 - loss: 0.5690 - val_accuracy: 0.7094 - val_loss: 0.5658
 Epoch 358/500
 10/10 0s 8ms/step -
 accuracy: 0.7031 - loss: 0.5668 - val_accuracy: 0.7094 - val_loss: 0.5657
 Epoch 359/500
 10/10 0s 7ms/step -
 accuracy: 0.7038 - loss: 0.5728 - val_accuracy: 0.7094 - val_loss: 0.5656
 Epoch 360/500
 10/10 0s 7ms/step -
 accuracy: 0.7208 - loss: 0.5538 - val_accuracy: 0.7094 - val_loss: 0.5656
 Epoch 361/500
 10/10 0s 7ms/step -
 accuracy: 0.7192 - loss: 0.5554 - val_accuracy: 0.7094 - val_loss: 0.5655
 Epoch 362/500
 10/10 0s 7ms/step -
 accuracy: 0.7032 - loss: 0.5769 - val_accuracy: 0.7094 - val_loss: 0.5655
 Epoch 363/500
 10/10 0s 7ms/step -
 accuracy: 0.7281 - loss: 0.5464 - val_accuracy: 0.7094 - val_loss: 0.5654
 Epoch 364/500
 10/10 0s 7ms/step -
 accuracy: 0.7238 - loss: 0.5550 - val_accuracy: 0.7094 - val_loss: 0.5653
 Epoch 365/500
 10/10 0s 12ms/step -
 accuracy: 0.7130 - loss: 0.5613 - val_accuracy: 0.7094 - val_loss: 0.5653
 Epoch 366/500
 10/10 0s 8ms/step -
 accuracy: 0.7218 - loss: 0.5625 - val_accuracy: 0.7094 - val_loss: 0.5652
 Epoch 367/500
 10/10 0s 7ms/step -
 accuracy: 0.7199 - loss: 0.5615 - val_accuracy: 0.7094 - val_loss: 0.5651
 Epoch 368/500
 10/10 0s 7ms/step -
 accuracy: 0.6765 - loss: 0.6004 - val_accuracy: 0.7094 - val_loss: 0.5651
 Epoch 369/500

10/10 0s 9ms/step -
 accuracy: 0.7277 - loss: 0.5536 - val_accuracy: 0.7094 - val_loss: 0.5650
 Epoch 370/500
 10/10 0s 7ms/step -
 accuracy: 0.7147 - loss: 0.5642 - val_accuracy: 0.7094 - val_loss: 0.5649
 Epoch 371/500
 10/10 0s 7ms/step -
 accuracy: 0.7356 - loss: 0.5462 - val_accuracy: 0.7094 - val_loss: 0.5649
 Epoch 372/500
 10/10 0s 7ms/step -
 accuracy: 0.6910 - loss: 0.5848 - val_accuracy: 0.7094 - val_loss: 0.5648
 Epoch 373/500
 10/10 0s 8ms/step -
 accuracy: 0.7213 - loss: 0.5586 - val_accuracy: 0.7094 - val_loss: 0.5648
 Epoch 374/500
 10/10 0s 7ms/step -
 accuracy: 0.7346 - loss: 0.5546 - val_accuracy: 0.7094 - val_loss: 0.5647
 Epoch 375/500
 10/10 0s 7ms/step -
 accuracy: 0.6968 - loss: 0.5805 - val_accuracy: 0.7094 - val_loss: 0.5646
 Epoch 376/500
 10/10 0s 7ms/step -
 accuracy: 0.6927 - loss: 0.5874 - val_accuracy: 0.7094 - val_loss: 0.5646
 Epoch 377/500
 10/10 0s 8ms/step -
 accuracy: 0.7015 - loss: 0.5719 - val_accuracy: 0.7094 - val_loss: 0.5645
 Epoch 378/500
 10/10 0s 7ms/step -
 accuracy: 0.7029 - loss: 0.5719 - val_accuracy: 0.7094 - val_loss: 0.5644
 Epoch 379/500
 10/10 0s 7ms/step -
 accuracy: 0.7168 - loss: 0.5589 - val_accuracy: 0.7094 - val_loss: 0.5644
 Epoch 380/500
 10/10 0s 7ms/step -
 accuracy: 0.7106 - loss: 0.5666 - val_accuracy: 0.7094 - val_loss: 0.5643
 Epoch 381/500
 10/10 0s 7ms/step -
 accuracy: 0.7443 - loss: 0.5360 - val_accuracy: 0.7094 - val_loss: 0.5642
 Epoch 382/500
 10/10 0s 7ms/step -
 accuracy: 0.7208 - loss: 0.5541 - val_accuracy: 0.7094 - val_loss: 0.5642
 Epoch 383/500
 10/10 0s 13ms/step -
 accuracy: 0.7286 - loss: 0.5427 - val_accuracy: 0.7094 - val_loss: 0.5641
 Epoch 384/500
 10/10 0s 9ms/step -
 accuracy: 0.7292 - loss: 0.5476 - val_accuracy: 0.7094 - val_loss: 0.5641
 Epoch 385/500

10/10 0s 8ms/step -
 accuracy: 0.7187 - loss: 0.5521 - val_accuracy: 0.7094 - val_loss: 0.5640
 Epoch 386/500
 10/10 0s 7ms/step -
 accuracy: 0.7251 - loss: 0.5528 - val_accuracy: 0.7094 - val_loss: 0.5639
 Epoch 387/500
 10/10 0s 7ms/step -
 accuracy: 0.7309 - loss: 0.5490 - val_accuracy: 0.7094 - val_loss: 0.5639
 Epoch 388/500
 10/10 0s 7ms/step -
 accuracy: 0.7140 - loss: 0.5538 - val_accuracy: 0.7094 - val_loss: 0.5638
 Epoch 389/500
 10/10 0s 7ms/step -
 accuracy: 0.7092 - loss: 0.5705 - val_accuracy: 0.7094 - val_loss: 0.5638
 Epoch 390/500
 10/10 0s 7ms/step -
 accuracy: 0.7386 - loss: 0.5379 - val_accuracy: 0.7094 - val_loss: 0.5637
 Epoch 391/500
 10/10 0s 8ms/step -
 accuracy: 0.7122 - loss: 0.5678 - val_accuracy: 0.7094 - val_loss: 0.5636
 Epoch 392/500
 10/10 0s 7ms/step -
 accuracy: 0.7204 - loss: 0.5603 - val_accuracy: 0.7094 - val_loss: 0.5636
 Epoch 393/500
 10/10 0s 7ms/step -
 accuracy: 0.7071 - loss: 0.5629 - val_accuracy: 0.7094 - val_loss: 0.5635
 Epoch 394/500
 10/10 0s 7ms/step -
 accuracy: 0.7283 - loss: 0.5503 - val_accuracy: 0.7094 - val_loss: 0.5635
 Epoch 395/500
 10/10 0s 7ms/step -
 accuracy: 0.7470 - loss: 0.5368 - val_accuracy: 0.7094 - val_loss: 0.5634
 Epoch 396/500
 10/10 0s 7ms/step -
 accuracy: 0.7005 - loss: 0.5677 - val_accuracy: 0.7094 - val_loss: 0.5634
 Epoch 397/500
 10/10 0s 7ms/step -
 accuracy: 0.6880 - loss: 0.5846 - val_accuracy: 0.7094 - val_loss: 0.5633
 Epoch 398/500
 10/10 0s 7ms/step -
 accuracy: 0.7225 - loss: 0.5589 - val_accuracy: 0.7094 - val_loss: 0.5632
 Epoch 399/500
 10/10 0s 7ms/step -
 accuracy: 0.7167 - loss: 0.5612 - val_accuracy: 0.7094 - val_loss: 0.5632
 Epoch 400/500
 10/10 0s 11ms/step -
 accuracy: 0.7339 - loss: 0.5458 - val_accuracy: 0.7094 - val_loss: 0.5631
 Epoch 401/500

10/10 0s 7ms/step -
 accuracy: 0.6959 - loss: 0.5787 - val_accuracy: 0.7094 - val_loss: 0.5631
 Epoch 402/500
 10/10 0s 7ms/step -
 accuracy: 0.7244 - loss: 0.5485 - val_accuracy: 0.7094 - val_loss: 0.5630
 Epoch 403/500
 10/10 0s 7ms/step -
 accuracy: 0.7043 - loss: 0.5722 - val_accuracy: 0.7094 - val_loss: 0.5630
 Epoch 404/500
 10/10 0s 8ms/step -
 accuracy: 0.7088 - loss: 0.5680 - val_accuracy: 0.7094 - val_loss: 0.5629
 Epoch 405/500
 10/10 0s 7ms/step -
 accuracy: 0.7095 - loss: 0.5665 - val_accuracy: 0.7094 - val_loss: 0.5629
 Epoch 406/500
 10/10 0s 8ms/step -
 accuracy: 0.7101 - loss: 0.5664 - val_accuracy: 0.7094 - val_loss: 0.5628
 Epoch 407/500
 10/10 0s 7ms/step -
 accuracy: 0.7141 - loss: 0.5605 - val_accuracy: 0.7094 - val_loss: 0.5628
 Epoch 408/500
 10/10 0s 7ms/step -
 accuracy: 0.7107 - loss: 0.5607 - val_accuracy: 0.7094 - val_loss: 0.5627
 Epoch 409/500
 10/10 0s 7ms/step -
 accuracy: 0.7038 - loss: 0.5682 - val_accuracy: 0.7094 - val_loss: 0.5626
 Epoch 410/500
 10/10 0s 7ms/step -
 accuracy: 0.7251 - loss: 0.5535 - val_accuracy: 0.7094 - val_loss: 0.5626
 Epoch 411/500
 10/10 0s 9ms/step -
 accuracy: 0.7089 - loss: 0.5627 - val_accuracy: 0.7094 - val_loss: 0.5626
 Epoch 412/500
 10/10 0s 8ms/step -
 accuracy: 0.7016 - loss: 0.5745 - val_accuracy: 0.7094 - val_loss: 0.5625
 Epoch 413/500
 10/10 0s 8ms/step -
 accuracy: 0.6855 - loss: 0.5824 - val_accuracy: 0.7094 - val_loss: 0.5625
 Epoch 414/500
 10/10 0s 8ms/step -
 accuracy: 0.6953 - loss: 0.5734 - val_accuracy: 0.7094 - val_loss: 0.5624
 Epoch 415/500
 10/10 0s 7ms/step -
 accuracy: 0.7077 - loss: 0.5672 - val_accuracy: 0.7094 - val_loss: 0.5623
 Epoch 416/500
 10/10 0s 7ms/step -
 accuracy: 0.7332 - loss: 0.5464 - val_accuracy: 0.7094 - val_loss: 0.5623
 Epoch 417/500

10/10 0s 8ms/step -
 accuracy: 0.6797 - loss: 0.5941 - val_accuracy: 0.7094 - val_loss: 0.5622
 Epoch 418/500
 10/10 0s 8ms/step -
 accuracy: 0.7228 - loss: 0.5591 - val_accuracy: 0.7094 - val_loss: 0.5621
 Epoch 419/500
 10/10 0s 7ms/step -
 accuracy: 0.7300 - loss: 0.5463 - val_accuracy: 0.7094 - val_loss: 0.5621
 Epoch 420/500
 10/10 0s 7ms/step -
 accuracy: 0.6591 - loss: 0.6003 - val_accuracy: 0.7094 - val_loss: 0.5620
 Epoch 421/500
 10/10 0s 8ms/step -
 accuracy: 0.7185 - loss: 0.5536 - val_accuracy: 0.7094 - val_loss: 0.5620
 Epoch 422/500
 10/10 0s 8ms/step -
 accuracy: 0.7138 - loss: 0.5615 - val_accuracy: 0.7094 - val_loss: 0.5619
 Epoch 423/500
 10/10 0s 8ms/step -
 accuracy: 0.6826 - loss: 0.5877 - val_accuracy: 0.7094 - val_loss: 0.5619
 Epoch 424/500
 10/10 0s 9ms/step -
 accuracy: 0.7282 - loss: 0.5506 - val_accuracy: 0.7094 - val_loss: 0.5618
 Epoch 425/500
 10/10 0s 8ms/step -
 accuracy: 0.7138 - loss: 0.5644 - val_accuracy: 0.7094 - val_loss: 0.5618
 Epoch 426/500
 10/10 0s 7ms/step -
 accuracy: 0.7531 - loss: 0.5215 - val_accuracy: 0.7094 - val_loss: 0.5617
 Epoch 427/500
 10/10 0s 7ms/step -
 accuracy: 0.7552 - loss: 0.5281 - val_accuracy: 0.7094 - val_loss: 0.5617
 Epoch 428/500
 10/10 0s 8ms/step -
 accuracy: 0.7086 - loss: 0.5650 - val_accuracy: 0.7094 - val_loss: 0.5616
 Epoch 429/500
 10/10 0s 8ms/step -
 accuracy: 0.7069 - loss: 0.5645 - val_accuracy: 0.7094 - val_loss: 0.5616
 Epoch 430/500
 10/10 0s 8ms/step -
 accuracy: 0.6999 - loss: 0.5680 - val_accuracy: 0.7094 - val_loss: 0.5615
 Epoch 431/500
 10/10 0s 7ms/step -
 accuracy: 0.6969 - loss: 0.5766 - val_accuracy: 0.7094 - val_loss: 0.5614
 Epoch 432/500
 10/10 0s 8ms/step -
 accuracy: 0.7416 - loss: 0.5369 - val_accuracy: 0.7094 - val_loss: 0.5614
 Epoch 433/500

10/10 0s 8ms/step -
 accuracy: 0.6980 - loss: 0.5667 - val_accuracy: 0.7094 - val_loss: 0.5613
 Epoch 434/500
 10/10 0s 7ms/step -
 accuracy: 0.7183 - loss: 0.5518 - val_accuracy: 0.7094 - val_loss: 0.5613
 Epoch 435/500
 10/10 0s 7ms/step -
 accuracy: 0.7032 - loss: 0.5654 - val_accuracy: 0.7094 - val_loss: 0.5612
 Epoch 436/500
 10/10 0s 7ms/step -
 accuracy: 0.7185 - loss: 0.5531 - val_accuracy: 0.7094 - val_loss: 0.5612
 Epoch 437/500
 10/10 0s 8ms/step -
 accuracy: 0.7179 - loss: 0.5608 - val_accuracy: 0.7094 - val_loss: 0.5611
 Epoch 438/500
 10/10 0s 7ms/step -
 accuracy: 0.7079 - loss: 0.5574 - val_accuracy: 0.7094 - val_loss: 0.5611
 Epoch 439/500
 10/10 0s 8ms/step -
 accuracy: 0.7208 - loss: 0.5505 - val_accuracy: 0.7094 - val_loss: 0.5611
 Epoch 440/500
 10/10 0s 8ms/step -
 accuracy: 0.7010 - loss: 0.5670 - val_accuracy: 0.7094 - val_loss: 0.5610
 Epoch 441/500
 10/10 0s 7ms/step -
 accuracy: 0.7393 - loss: 0.5391 - val_accuracy: 0.7094 - val_loss: 0.5609
 Epoch 442/500
 10/10 0s 8ms/step -
 accuracy: 0.7040 - loss: 0.5667 - val_accuracy: 0.7094 - val_loss: 0.5609
 Epoch 443/500
 10/10 0s 8ms/step -
 accuracy: 0.7123 - loss: 0.5516 - val_accuracy: 0.7094 - val_loss: 0.5608
 Epoch 444/500
 10/10 0s 7ms/step -
 accuracy: 0.7007 - loss: 0.5747 - val_accuracy: 0.7094 - val_loss: 0.5608
 Epoch 445/500
 10/10 0s 8ms/step -
 accuracy: 0.7134 - loss: 0.5654 - val_accuracy: 0.7094 - val_loss: 0.5607
 Epoch 446/500
 10/10 0s 7ms/step -
 accuracy: 0.7149 - loss: 0.5552 - val_accuracy: 0.7094 - val_loss: 0.5607
 Epoch 447/500
 10/10 0s 7ms/step -
 accuracy: 0.7307 - loss: 0.5414 - val_accuracy: 0.7094 - val_loss: 0.5606
 Epoch 448/500
 10/10 0s 8ms/step -
 accuracy: 0.7294 - loss: 0.5459 - val_accuracy: 0.7094 - val_loss: 0.5606
 Epoch 449/500

10/10 0s 7ms/step -
 accuracy: 0.6913 - loss: 0.5705 - val_accuracy: 0.7094 - val_loss: 0.5605
 Epoch 450/500
 10/10 0s 8ms/step -
 accuracy: 0.7112 - loss: 0.5577 - val_accuracy: 0.7094 - val_loss: 0.5605
 Epoch 451/500
 10/10 0s 7ms/step -
 accuracy: 0.7435 - loss: 0.5369 - val_accuracy: 0.7094 - val_loss: 0.5604
 Epoch 452/500
 10/10 0s 7ms/step -
 accuracy: 0.7144 - loss: 0.5638 - val_accuracy: 0.7094 - val_loss: 0.5604
 Epoch 453/500
 10/10 0s 8ms/step -
 accuracy: 0.7334 - loss: 0.5449 - val_accuracy: 0.7094 - val_loss: 0.5603
 Epoch 454/500
 10/10 0s 8ms/step -
 accuracy: 0.7145 - loss: 0.5630 - val_accuracy: 0.7094 - val_loss: 0.5603
 Epoch 455/500
 10/10 0s 8ms/step -
 accuracy: 0.7096 - loss: 0.5730 - val_accuracy: 0.7094 - val_loss: 0.5602
 Epoch 456/500
 10/10 0s 7ms/step -
 accuracy: 0.7191 - loss: 0.5540 - val_accuracy: 0.7094 - val_loss: 0.5602
 Epoch 457/500
 10/10 0s 7ms/step -
 accuracy: 0.7218 - loss: 0.5502 - val_accuracy: 0.7094 - val_loss: 0.5601
 Epoch 458/500
 10/10 0s 7ms/step -
 accuracy: 0.7216 - loss: 0.5561 - val_accuracy: 0.7094 - val_loss: 0.5601
 Epoch 459/500
 10/10 0s 7ms/step -
 accuracy: 0.7121 - loss: 0.5593 - val_accuracy: 0.7094 - val_loss: 0.5601
 Epoch 460/500
 10/10 0s 8ms/step -
 accuracy: 0.6845 - loss: 0.5855 - val_accuracy: 0.7094 - val_loss: 0.5600
 Epoch 461/500
 10/10 0s 8ms/step -
 accuracy: 0.6947 - loss: 0.5698 - val_accuracy: 0.7094 - val_loss: 0.5600
 Epoch 462/500
 10/10 0s 13ms/step -
 accuracy: 0.7084 - loss: 0.5617 - val_accuracy: 0.7094 - val_loss: 0.5599
 Epoch 463/500
 10/10 0s 7ms/step -
 accuracy: 0.7230 - loss: 0.5508 - val_accuracy: 0.7094 - val_loss: 0.5599
 Epoch 464/500
 10/10 0s 7ms/step -
 accuracy: 0.7174 - loss: 0.5508 - val_accuracy: 0.7094 - val_loss: 0.5598
 Epoch 465/500

10/10 0s 8ms/step -
 accuracy: 0.7069 - loss: 0.5601 - val_accuracy: 0.7094 - val_loss: 0.5598
 Epoch 466/500
 10/10 0s 7ms/step -
 accuracy: 0.7225 - loss: 0.5513 - val_accuracy: 0.7094 - val_loss: 0.5597
 Epoch 467/500
 10/10 0s 7ms/step -
 accuracy: 0.7378 - loss: 0.5311 - val_accuracy: 0.7094 - val_loss: 0.5597
 Epoch 468/500
 10/10 0s 7ms/step -
 accuracy: 0.6975 - loss: 0.5737 - val_accuracy: 0.7094 - val_loss: 0.5596
 Epoch 469/500
 10/10 0s 8ms/step -
 accuracy: 0.7243 - loss: 0.5418 - val_accuracy: 0.7094 - val_loss: 0.5596
 Epoch 470/500
 10/10 0s 8ms/step -
 accuracy: 0.7157 - loss: 0.5586 - val_accuracy: 0.7094 - val_loss: 0.5595
 Epoch 471/500
 10/10 0s 7ms/step -
 accuracy: 0.7172 - loss: 0.5606 - val_accuracy: 0.7094 - val_loss: 0.5595
 Epoch 472/500
 10/10 0s 9ms/step -
 accuracy: 0.7345 - loss: 0.5377 - val_accuracy: 0.7094 - val_loss: 0.5594
 Epoch 473/500
 10/10 0s 8ms/step -
 accuracy: 0.7202 - loss: 0.5483 - val_accuracy: 0.7094 - val_loss: 0.5594
 Epoch 474/500
 10/10 0s 7ms/step -
 accuracy: 0.7117 - loss: 0.5612 - val_accuracy: 0.7094 - val_loss: 0.5594
 Epoch 475/500
 10/10 0s 7ms/step -
 accuracy: 0.7198 - loss: 0.5548 - val_accuracy: 0.7094 - val_loss: 0.5593
 Epoch 476/500
 10/10 0s 7ms/step -
 accuracy: 0.7007 - loss: 0.5701 - val_accuracy: 0.7094 - val_loss: 0.5593
 Epoch 477/500
 10/10 0s 8ms/step -
 accuracy: 0.7099 - loss: 0.5593 - val_accuracy: 0.7094 - val_loss: 0.5592
 Epoch 478/500
 10/10 0s 7ms/step -
 accuracy: 0.6909 - loss: 0.5815 - val_accuracy: 0.7094 - val_loss: 0.5592
 Epoch 479/500
 10/10 0s 8ms/step -
 accuracy: 0.7016 - loss: 0.5667 - val_accuracy: 0.7094 - val_loss: 0.5591
 Epoch 480/500
 10/10 0s 9ms/step -
 accuracy: 0.6997 - loss: 0.5672 - val_accuracy: 0.7094 - val_loss: 0.5591
 Epoch 481/500

10/10 0s 10ms/step -
 accuracy: 0.7249 - loss: 0.5473 - val_accuracy: 0.7094 - val_loss: 0.5590
 Epoch 482/500
 10/10 0s 12ms/step -
 accuracy: 0.7291 - loss: 0.5502 - val_accuracy: 0.7094 - val_loss: 0.5590
 Epoch 483/500
 10/10 0s 12ms/step -
 accuracy: 0.7041 - loss: 0.5706 - val_accuracy: 0.7094 - val_loss: 0.5589
 Epoch 484/500
 10/10 0s 12ms/step -
 accuracy: 0.7119 - loss: 0.5542 - val_accuracy: 0.7094 - val_loss: 0.5589
 Epoch 485/500
 10/10 0s 13ms/step -
 accuracy: 0.7227 - loss: 0.5510 - val_accuracy: 0.7094 - val_loss: 0.5588
 Epoch 486/500
 10/10 0s 12ms/step -
 accuracy: 0.7017 - loss: 0.5629 - val_accuracy: 0.7094 - val_loss: 0.5588
 Epoch 487/500
 10/10 0s 10ms/step -
 accuracy: 0.6981 - loss: 0.5624 - val_accuracy: 0.7094 - val_loss: 0.5588
 Epoch 488/500
 10/10 0s 24ms/step -
 accuracy: 0.6813 - loss: 0.5870 - val_accuracy: 0.7094 - val_loss: 0.5587
 Epoch 489/500
 10/10 0s 12ms/step -
 accuracy: 0.7035 - loss: 0.5664 - val_accuracy: 0.7094 - val_loss: 0.5587
 Epoch 490/500
 10/10 0s 13ms/step -
 accuracy: 0.6973 - loss: 0.5675 - val_accuracy: 0.7094 - val_loss: 0.5586
 Epoch 491/500
 10/10 0s 17ms/step -
 accuracy: 0.7005 - loss: 0.5715 - val_accuracy: 0.7094 - val_loss: 0.5586
 Epoch 492/500
 10/10 0s 21ms/step -
 accuracy: 0.6954 - loss: 0.5720 - val_accuracy: 0.7094 - val_loss: 0.5585
 Epoch 493/500
 10/10 0s 11ms/step -
 accuracy: 0.7161 - loss: 0.5567 - val_accuracy: 0.7094 - val_loss: 0.5585
 Epoch 494/500
 10/10 0s 9ms/step -
 accuracy: 0.7027 - loss: 0.5655 - val_accuracy: 0.7094 - val_loss: 0.5585
 Epoch 495/500
 10/10 0s 14ms/step -
 accuracy: 0.7272 - loss: 0.5405 - val_accuracy: 0.7094 - val_loss: 0.5584
 Epoch 496/500
 10/10 0s 8ms/step -
 accuracy: 0.6905 - loss: 0.5726 - val_accuracy: 0.7094 - val_loss: 0.5584
 Epoch 497/500

```

10/10          0s 9ms/step -
accuracy: 0.7364 - loss: 0.5377 - val_accuracy: 0.7094 - val_loss: 0.5583
Epoch 498/500
10/10          0s 9ms/step -
accuracy: 0.7233 - loss: 0.5489 - val_accuracy: 0.7094 - val_loss: 0.5583
Epoch 499/500
10/10          0s 8ms/step -
accuracy: 0.7126 - loss: 0.5578 - val_accuracy: 0.7094 - val_loss: 0.5582
Epoch 500/500
10/10          0s 8ms/step -
accuracy: 0.6994 - loss: 0.5645 - val_accuracy: 0.7094 - val_loss: 0.5582

```

```

[42]: final_val_accuracy = history.history['val_accuracy'][-1]
      print(f"Final Validation Accuracy: {final_val_accuracy * 100:.2f}%")

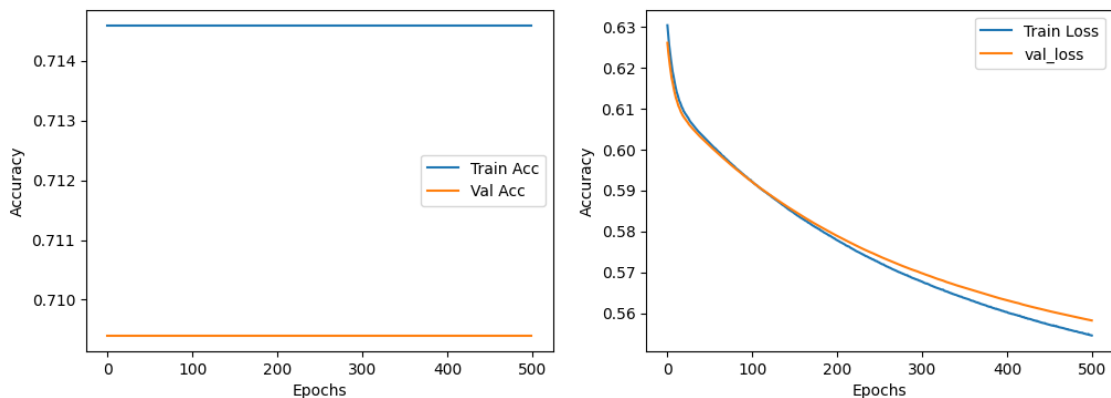
```

Final Validation Accuracy: 70.94%

```

[43]: plt.figure(figsize=(12,4))
      plt.subplot(1,2,1)
      plt.plot(history.history['accuracy'], label='Train Acc')
      plt.plot(history.history['val_accuracy'], label='Val Acc')
      plt.xlabel('Epochs')
      plt.ylabel('Accuracy')
      plt.legend()
      plt.subplot(1,2,2)
      plt.plot(history.history['loss'], label='Train Loss')
      plt.plot(history.history['val_loss'], label='val_loss')
      plt.xlabel('Epochs')
      plt.ylabel('Accuracy')
      plt.legend()
      plt.show()

```



0.5.1 Model with 9 neurons in the input layer, 10 neurons in the hidden layer and 2 neurons in the output layer

```
[45]: model = Sequential()
model.add(Dense(10, activation = 'sigmoid', input_shape = (9,)))
model.add(Dense(2, activation = 'sigmoid'))
model.summary()
```

Model: "sequential_3"

Layer (type)	Output Shape	Param #
dense_4 (Dense)	(None, 10)	100
dense_5 (Dense)	(None, 2)	22

Total params: 122 (488.00 B)

Trainable params: 122 (488.00 B)

Non-trainable params: 0 (0.00 B)

```
[47]: model.compile(loss = "BinaryCrossentropy", optimizer = "SGD", metrics = [
    ↪ "accuracy"])
history = model.fit(x_train,y_train_2, batch_size=50, epochs = 500, verbose=1,
    ↪ validation_data=(x_test,y_test_2))
```

Epoch 1/500

10/10 1s 26ms/step -

accuracy: 0.3015 - loss: 0.9649 - val_accuracy: 0.2906 - val_loss: 0.9474

Epoch 2/500

10/10 0s 8ms/step -

accuracy: 0.2979 - loss: 0.9337 - val_accuracy: 0.2906 - val_loss: 0.9157

Epoch 3/500

10/10 0s 8ms/step -

accuracy: 0.2867 - loss: 0.9105 - val_accuracy: 0.2906 - val_loss: 0.8866

Epoch 4/500

10/10 0s 8ms/step -

accuracy: 0.2965 - loss: 0.8772 - val_accuracy: 0.2906 - val_loss: 0.8601

Epoch 5/500

10/10 0s 8ms/step -

accuracy: 0.2794 - loss: 0.8600 - val_accuracy: 0.2906 - val_loss: 0.8369

Epoch 6/500

10/10 0s 8ms/step -

accuracy: 0.2905 - loss: 0.8310 - val_accuracy: 0.2906 - val_loss: 0.8150
 Epoch 7/500
 10/10 0s 8ms/step -
 accuracy: 0.2740 - loss: 0.8175 - val_accuracy: 0.2906 - val_loss: 0.7951
 Epoch 8/500
 10/10 0s 8ms/step -
 accuracy: 0.2753 - loss: 0.7955 - val_accuracy: 0.2906 - val_loss: 0.7777
 Epoch 9/500
 10/10 0s 9ms/step -
 accuracy: 0.2765 - loss: 0.7782 - val_accuracy: 0.2906 - val_loss: 0.7617
 Epoch 10/500
 10/10 0s 9ms/step -
 accuracy: 0.2702 - loss: 0.7622 - val_accuracy: 0.2906 - val_loss: 0.7471
 Epoch 11/500
 10/10 0s 9ms/step -
 accuracy: 0.2756 - loss: 0.7461 - val_accuracy: 0.2906 - val_loss: 0.7330
 Epoch 12/500
 10/10 0s 8ms/step -
 accuracy: 0.2766 - loss: 0.7324 - val_accuracy: 0.2906 - val_loss: 0.7205
 Epoch 13/500
 10/10 0s 8ms/step -
 accuracy: 0.3149 - loss: 0.7156 - val_accuracy: 0.2906 - val_loss: 0.7091
 Epoch 14/500
 10/10 0s 9ms/step -
 accuracy: 0.3871 - loss: 0.7049 - val_accuracy: 0.5214 - val_loss: 0.6989
 Epoch 15/500
 10/10 0s 8ms/step -
 accuracy: 0.5701 - loss: 0.6960 - val_accuracy: 0.7094 - val_loss: 0.6903
 Epoch 16/500
 10/10 0s 8ms/step -
 accuracy: 0.7131 - loss: 0.6873 - val_accuracy: 0.7094 - val_loss: 0.6819
 Epoch 17/500
 10/10 0s 8ms/step -
 accuracy: 0.6708 - loss: 0.6835 - val_accuracy: 0.7094 - val_loss: 0.6747
 Epoch 18/500
 10/10 0s 8ms/step -
 accuracy: 0.7240 - loss: 0.6707 - val_accuracy: 0.7094 - val_loss: 0.6681
 Epoch 19/500
 10/10 0s 9ms/step -
 accuracy: 0.7118 - loss: 0.6653 - val_accuracy: 0.7094 - val_loss: 0.6624
 Epoch 20/500
 10/10 0s 10ms/step -
 accuracy: 0.7048 - loss: 0.6616 - val_accuracy: 0.7094 - val_loss: 0.6572
 Epoch 21/500
 10/10 0s 9ms/step -
 accuracy: 0.7368 - loss: 0.6498 - val_accuracy: 0.7094 - val_loss: 0.6517
 Epoch 22/500
 10/10 0s 10ms/step -

accuracy: 0.6922 - loss: 0.6547 - val_accuracy: 0.7094 - val_loss: 0.6470
 Epoch 23/500
 10/10 0s 9ms/step -
 accuracy: 0.7288 - loss: 0.6401 - val_accuracy: 0.7094 - val_loss: 0.6430
 Epoch 24/500
 10/10 0s 10ms/step -
 accuracy: 0.7072 - loss: 0.6421 - val_accuracy: 0.7094 - val_loss: 0.6388
 Epoch 25/500
 10/10 0s 10ms/step -
 accuracy: 0.7152 - loss: 0.6354 - val_accuracy: 0.7094 - val_loss: 0.6354
 Epoch 26/500
 10/10 0s 17ms/step -
 accuracy: 0.7257 - loss: 0.6280 - val_accuracy: 0.7094 - val_loss: 0.6323
 Epoch 27/500
 10/10 0s 11ms/step -
 accuracy: 0.7267 - loss: 0.6240 - val_accuracy: 0.7094 - val_loss: 0.6297
 Epoch 28/500
 10/10 0s 13ms/step -
 accuracy: 0.7079 - loss: 0.6291 - val_accuracy: 0.7094 - val_loss: 0.6274
 Epoch 29/500
 10/10 0s 11ms/step -
 accuracy: 0.7066 - loss: 0.6273 - val_accuracy: 0.7094 - val_loss: 0.6249
 Epoch 30/500
 10/10 0s 10ms/step -
 accuracy: 0.7247 - loss: 0.6166 - val_accuracy: 0.7094 - val_loss: 0.6231
 Epoch 31/500
 10/10 0s 8ms/step -
 accuracy: 0.7117 - loss: 0.6212 - val_accuracy: 0.7094 - val_loss: 0.6213
 Epoch 32/500
 10/10 0s 8ms/step -
 accuracy: 0.7085 - loss: 0.6213 - val_accuracy: 0.7094 - val_loss: 0.6196
 Epoch 33/500
 10/10 0s 8ms/step -
 accuracy: 0.7165 - loss: 0.6151 - val_accuracy: 0.7094 - val_loss: 0.6181
 Epoch 34/500
 10/10 0s 9ms/step -
 accuracy: 0.7076 - loss: 0.6184 - val_accuracy: 0.7094 - val_loss: 0.6168
 Epoch 35/500
 10/10 0s 9ms/step -
 accuracy: 0.7009 - loss: 0.6205 - val_accuracy: 0.7094 - val_loss: 0.6153
 Epoch 36/500
 10/10 0s 8ms/step -
 accuracy: 0.7168 - loss: 0.6106 - val_accuracy: 0.7094 - val_loss: 0.6142
 Epoch 37/500
 10/10 0s 10ms/step -
 accuracy: 0.7412 - loss: 0.5945 - val_accuracy: 0.7094 - val_loss: 0.6133
 Epoch 38/500
 10/10 0s 8ms/step -

accuracy: 0.7115 - loss: 0.6112 - val_accuracy: 0.7094 - val_loss: 0.6124
 Epoch 39/500
 10/10 0s 10ms/step -
 accuracy: 0.7163 - loss: 0.6073 - val_accuracy: 0.7094 - val_loss: 0.6117
 Epoch 40/500
 10/10 0s 8ms/step -
 accuracy: 0.6922 - loss: 0.6216 - val_accuracy: 0.7094 - val_loss: 0.6109
 Epoch 41/500
 10/10 0s 8ms/step -
 accuracy: 0.7169 - loss: 0.6057 - val_accuracy: 0.7094 - val_loss: 0.6101
 Epoch 42/500
 10/10 0s 8ms/step -
 accuracy: 0.7138 - loss: 0.6067 - val_accuracy: 0.7094 - val_loss: 0.6095
 Epoch 43/500
 10/10 0s 8ms/step -
 accuracy: 0.7150 - loss: 0.6050 - val_accuracy: 0.7094 - val_loss: 0.6090
 Epoch 44/500
 10/10 0s 8ms/step -
 accuracy: 0.7435 - loss: 0.5858 - val_accuracy: 0.7094 - val_loss: 0.6084
 Epoch 45/500
 10/10 0s 8ms/step -
 accuracy: 0.7285 - loss: 0.5949 - val_accuracy: 0.7094 - val_loss: 0.6078
 Epoch 46/500
 10/10 0s 8ms/step -
 accuracy: 0.7349 - loss: 0.5896 - val_accuracy: 0.7094 - val_loss: 0.6073
 Epoch 47/500
 10/10 0s 8ms/step -
 accuracy: 0.7157 - loss: 0.6023 - val_accuracy: 0.7094 - val_loss: 0.6069
 Epoch 48/500
 10/10 0s 8ms/step -
 accuracy: 0.7333 - loss: 0.5892 - val_accuracy: 0.7094 - val_loss: 0.6066
 Epoch 49/500
 10/10 0s 8ms/step -
 accuracy: 0.7191 - loss: 0.5992 - val_accuracy: 0.7094 - val_loss: 0.6063
 Epoch 50/500
 10/10 0s 11ms/step -
 accuracy: 0.7229 - loss: 0.5964 - val_accuracy: 0.7094 - val_loss: 0.6060
 Epoch 51/500
 10/10 0s 8ms/step -
 accuracy: 0.7039 - loss: 0.6095 - val_accuracy: 0.7094 - val_loss: 0.6057
 Epoch 52/500
 10/10 0s 8ms/step -
 accuracy: 0.6998 - loss: 0.6122 - val_accuracy: 0.7094 - val_loss: 0.6054
 Epoch 53/500
 10/10 0s 8ms/step -
 accuracy: 0.7133 - loss: 0.6016 - val_accuracy: 0.7094 - val_loss: 0.6051
 Epoch 54/500
 10/10 0s 8ms/step -

accuracy: 0.7068 - loss: 0.6062 - val_accuracy: 0.7094 - val_loss: 0.6048
 Epoch 55/500
 10/10 0s 8ms/step -
 accuracy: 0.7312 - loss: 0.5877 - val_accuracy: 0.7094 - val_loss: 0.6046
 Epoch 56/500
 10/10 0s 8ms/step -
 accuracy: 0.6891 - loss: 0.6196 - val_accuracy: 0.7094 - val_loss: 0.6043
 Epoch 57/500
 10/10 0s 12ms/step -
 accuracy: 0.7077 - loss: 0.6053 - val_accuracy: 0.7094 - val_loss: 0.6042
 Epoch 58/500
 10/10 0s 8ms/step -
 accuracy: 0.7328 - loss: 0.5850 - val_accuracy: 0.7094 - val_loss: 0.6040
 Epoch 59/500
 10/10 0s 8ms/step -
 accuracy: 0.7311 - loss: 0.5862 - val_accuracy: 0.7094 - val_loss: 0.6039
 Epoch 60/500
 10/10 0s 11ms/step -
 accuracy: 0.6892 - loss: 0.6192 - val_accuracy: 0.7094 - val_loss: 0.6037
 Epoch 61/500
 10/10 0s 7ms/step -
 accuracy: 0.6923 - loss: 0.6174 - val_accuracy: 0.7094 - val_loss: 0.6036
 Epoch 62/500
 10/10 0s 15ms/step -
 accuracy: 0.7136 - loss: 0.5998 - val_accuracy: 0.7094 - val_loss: 0.6036
 Epoch 63/500
 10/10 0s 9ms/step -
 accuracy: 0.6908 - loss: 0.6182 - val_accuracy: 0.7094 - val_loss: 0.6035
 Epoch 64/500
 10/10 0s 8ms/step -
 accuracy: 0.7394 - loss: 0.5786 - val_accuracy: 0.7094 - val_loss: 0.6034
 Epoch 65/500
 10/10 0s 9ms/step -
 accuracy: 0.7018 - loss: 0.6092 - val_accuracy: 0.7094 - val_loss: 0.6033
 Epoch 66/500
 10/10 0s 8ms/step -
 accuracy: 0.7196 - loss: 0.5946 - val_accuracy: 0.7094 - val_loss: 0.6032
 Epoch 67/500
 10/10 0s 8ms/step -
 accuracy: 0.7265 - loss: 0.5884 - val_accuracy: 0.7094 - val_loss: 0.6031
 Epoch 68/500
 10/10 0s 8ms/step -
 accuracy: 0.7054 - loss: 0.6059 - val_accuracy: 0.7094 - val_loss: 0.6031
 Epoch 69/500
 10/10 0s 8ms/step -
 accuracy: 0.7306 - loss: 0.5850 - val_accuracy: 0.7094 - val_loss: 0.6030
 Epoch 70/500
 10/10 0s 8ms/step -

accuracy: 0.7126 - loss: 0.6000 - val_accuracy: 0.7094 - val_loss: 0.6030
 Epoch 71/500
 10/10 0s 8ms/step -
 accuracy: 0.7087 - loss: 0.6034 - val_accuracy: 0.7094 - val_loss: 0.6030
 Epoch 72/500
 10/10 0s 9ms/step -
 accuracy: 0.7046 - loss: 0.6067 - val_accuracy: 0.7094 - val_loss: 0.6029
 Epoch 73/500
 10/10 0s 9ms/step -
 accuracy: 0.7192 - loss: 0.5942 - val_accuracy: 0.7094 - val_loss: 0.6029
 Epoch 74/500
 10/10 0s 10ms/step -
 accuracy: 0.7127 - loss: 0.5994 - val_accuracy: 0.7094 - val_loss: 0.6029
 Epoch 75/500
 10/10 0s 8ms/step -
 accuracy: 0.7185 - loss: 0.5947 - val_accuracy: 0.7094 - val_loss: 0.6029
 Epoch 76/500
 10/10 0s 8ms/step -
 accuracy: 0.7188 - loss: 0.5942 - val_accuracy: 0.7094 - val_loss: 0.6028
 Epoch 77/500
 10/10 0s 10ms/step -
 accuracy: 0.7246 - loss: 0.5897 - val_accuracy: 0.7094 - val_loss: 0.6028
 Epoch 78/500
 10/10 0s 8ms/step -
 accuracy: 0.7091 - loss: 0.6025 - val_accuracy: 0.7094 - val_loss: 0.6028
 Epoch 79/500
 10/10 0s 7ms/step -
 accuracy: 0.7088 - loss: 0.6029 - val_accuracy: 0.7094 - val_loss: 0.6027
 Epoch 80/500
 10/10 0s 19ms/step -
 accuracy: 0.7214 - loss: 0.5920 - val_accuracy: 0.7094 - val_loss: 0.6027
 Epoch 81/500
 10/10 0s 7ms/step -
 accuracy: 0.7084 - loss: 0.6032 - val_accuracy: 0.7094 - val_loss: 0.6027
 Epoch 82/500
 10/10 0s 13ms/step -
 accuracy: 0.7245 - loss: 0.5891 - val_accuracy: 0.7094 - val_loss: 0.6027
 Epoch 83/500
 10/10 0s 7ms/step -
 accuracy: 0.7170 - loss: 0.5954 - val_accuracy: 0.7094 - val_loss: 0.6026
 Epoch 84/500
 10/10 0s 8ms/step -
 accuracy: 0.7148 - loss: 0.5974 - val_accuracy: 0.7094 - val_loss: 0.6026
 Epoch 85/500
 10/10 0s 8ms/step -
 accuracy: 0.7108 - loss: 0.6009 - val_accuracy: 0.7094 - val_loss: 0.6026
 Epoch 86/500
 10/10 0s 8ms/step -

accuracy: 0.7224 - loss: 0.5912 - val_accuracy: 0.7094 - val_loss: 0.6026
 Epoch 87/500
 10/10 0s 9ms/step -
 accuracy: 0.7175 - loss: 0.5950 - val_accuracy: 0.7094 - val_loss: 0.6026
 Epoch 88/500
 10/10 0s 9ms/step -
 accuracy: 0.7280 - loss: 0.5859 - val_accuracy: 0.7094 - val_loss: 0.6026
 Epoch 89/500
 10/10 0s 10ms/step -
 accuracy: 0.6996 - loss: 0.6105 - val_accuracy: 0.7094 - val_loss: 0.6026
 Epoch 90/500
 10/10 0s 9ms/step -
 accuracy: 0.7251 - loss: 0.5887 - val_accuracy: 0.7094 - val_loss: 0.6026
 Epoch 91/500
 10/10 0s 9ms/step -
 accuracy: 0.6887 - loss: 0.6201 - val_accuracy: 0.7094 - val_loss: 0.6026
 Epoch 92/500
 10/10 0s 8ms/step -
 accuracy: 0.7236 - loss: 0.5897 - val_accuracy: 0.7094 - val_loss: 0.6025
 Epoch 93/500
 10/10 0s 9ms/step -
 accuracy: 0.6823 - loss: 0.6261 - val_accuracy: 0.7094 - val_loss: 0.6025
 Epoch 94/500
 10/10 0s 8ms/step -
 accuracy: 0.7009 - loss: 0.6096 - val_accuracy: 0.7094 - val_loss: 0.6025
 Epoch 95/500
 10/10 0s 8ms/step -
 accuracy: 0.7232 - loss: 0.5897 - val_accuracy: 0.7094 - val_loss: 0.6025
 Epoch 96/500
 10/10 0s 8ms/step -
 accuracy: 0.7086 - loss: 0.6026 - val_accuracy: 0.7094 - val_loss: 0.6025
 Epoch 97/500
 10/10 0s 8ms/step -
 accuracy: 0.7313 - loss: 0.5827 - val_accuracy: 0.7094 - val_loss: 0.6025
 Epoch 98/500
 10/10 0s 12ms/step -
 accuracy: 0.6962 - loss: 0.6138 - val_accuracy: 0.7094 - val_loss: 0.6025
 Epoch 99/500
 10/10 0s 8ms/step -
 accuracy: 0.7267 - loss: 0.5865 - val_accuracy: 0.7094 - val_loss: 0.6025
 Epoch 100/500
 10/10 0s 8ms/step -
 accuracy: 0.7050 - loss: 0.6062 - val_accuracy: 0.7094 - val_loss: 0.6025
 Epoch 101/500
 10/10 0s 8ms/step -
 accuracy: 0.7111 - loss: 0.6005 - val_accuracy: 0.7094 - val_loss: 0.6025
 Epoch 102/500
 10/10 0s 8ms/step -

accuracy: 0.7043 - loss: 0.6063 - val_accuracy: 0.7094 - val_loss: 0.6025
 Epoch 103/500
 10/10 0s 8ms/step -
 accuracy: 0.6986 - loss: 0.6118 - val_accuracy: 0.7094 - val_loss: 0.6025
 Epoch 104/500
 10/10 0s 7ms/step -
 accuracy: 0.6877 - loss: 0.6219 - val_accuracy: 0.7094 - val_loss: 0.6025
 Epoch 105/500
 10/10 0s 8ms/step -
 accuracy: 0.7055 - loss: 0.6054 - val_accuracy: 0.7094 - val_loss: 0.6025
 Epoch 106/500
 10/10 0s 8ms/step -
 accuracy: 0.7158 - loss: 0.5964 - val_accuracy: 0.7094 - val_loss: 0.6024
 Epoch 107/500
 10/10 0s 7ms/step -
 accuracy: 0.7250 - loss: 0.5881 - val_accuracy: 0.7094 - val_loss: 0.6024
 Epoch 108/500
 10/10 0s 10ms/step -
 accuracy: 0.7169 - loss: 0.5954 - val_accuracy: 0.7094 - val_loss: 0.6024
 Epoch 109/500
 10/10 0s 10ms/step -
 accuracy: 0.6937 - loss: 0.6160 - val_accuracy: 0.7094 - val_loss: 0.6024
 Epoch 110/500
 10/10 0s 10ms/step -
 accuracy: 0.6954 - loss: 0.6151 - val_accuracy: 0.7094 - val_loss: 0.6024
 Epoch 111/500
 10/10 0s 9ms/step -
 accuracy: 0.6990 - loss: 0.6110 - val_accuracy: 0.7094 - val_loss: 0.6024
 Epoch 112/500
 10/10 0s 8ms/step -
 accuracy: 0.7050 - loss: 0.6062 - val_accuracy: 0.7094 - val_loss: 0.6024
 Epoch 113/500
 10/10 0s 20ms/step -
 accuracy: 0.7155 - loss: 0.5962 - val_accuracy: 0.7094 - val_loss: 0.6024
 Epoch 114/500
 10/10 0s 9ms/step -
 accuracy: 0.7158 - loss: 0.5962 - val_accuracy: 0.7094 - val_loss: 0.6024
 Epoch 115/500
 10/10 0s 9ms/step -
 accuracy: 0.7196 - loss: 0.5929 - val_accuracy: 0.7094 - val_loss: 0.6024
 Epoch 116/500
 10/10 0s 8ms/step -
 accuracy: 0.7085 - loss: 0.6024 - val_accuracy: 0.7094 - val_loss: 0.6024
 Epoch 117/500
 10/10 0s 9ms/step -
 accuracy: 0.7031 - loss: 0.6074 - val_accuracy: 0.7094 - val_loss: 0.6024
 Epoch 118/500
 10/10 0s 9ms/step -

accuracy: 0.7364 - loss: 0.5777 - val_accuracy: 0.7094 - val_loss: 0.6024
 Epoch 119/500
 10/10 0s 9ms/step -
 accuracy: 0.7264 - loss: 0.5861 - val_accuracy: 0.7094 - val_loss: 0.6024
 Epoch 120/500
 10/10 0s 9ms/step -
 accuracy: 0.6993 - loss: 0.6111 - val_accuracy: 0.7094 - val_loss: 0.6023
 Epoch 121/500
 10/10 0s 9ms/step -
 accuracy: 0.7180 - loss: 0.5939 - val_accuracy: 0.7094 - val_loss: 0.6023
 Epoch 122/500
 10/10 0s 10ms/step -
 accuracy: 0.6961 - loss: 0.6138 - val_accuracy: 0.7094 - val_loss: 0.6023
 Epoch 123/500
 10/10 0s 9ms/step -
 accuracy: 0.7205 - loss: 0.5921 - val_accuracy: 0.7094 - val_loss: 0.6023
 Epoch 124/500
 10/10 0s 9ms/step -
 accuracy: 0.6977 - loss: 0.6127 - val_accuracy: 0.7094 - val_loss: 0.6023
 Epoch 125/500
 10/10 0s 9ms/step -
 accuracy: 0.7138 - loss: 0.5980 - val_accuracy: 0.7094 - val_loss: 0.6023
 Epoch 126/500
 10/10 0s 12ms/step -
 accuracy: 0.7069 - loss: 0.6041 - val_accuracy: 0.7094 - val_loss: 0.6023
 Epoch 127/500
 10/10 0s 8ms/step -
 accuracy: 0.7165 - loss: 0.5952 - val_accuracy: 0.7094 - val_loss: 0.6023
 Epoch 128/500
 10/10 0s 9ms/step -
 accuracy: 0.7243 - loss: 0.5884 - val_accuracy: 0.7094 - val_loss: 0.6023
 Epoch 129/500
 10/10 0s 9ms/step -
 accuracy: 0.7462 - loss: 0.5681 - val_accuracy: 0.7094 - val_loss: 0.6023
 Epoch 130/500
 10/10 0s 10ms/step -
 accuracy: 0.7084 - loss: 0.6029 - val_accuracy: 0.7094 - val_loss: 0.6023
 Epoch 131/500
 10/10 0s 8ms/step -
 accuracy: 0.7005 - loss: 0.6100 - val_accuracy: 0.7094 - val_loss: 0.6023
 Epoch 132/500
 10/10 0s 10ms/step -
 accuracy: 0.7117 - loss: 0.6000 - val_accuracy: 0.7094 - val_loss: 0.6023
 Epoch 133/500
 10/10 0s 8ms/step -
 accuracy: 0.7031 - loss: 0.6073 - val_accuracy: 0.7094 - val_loss: 0.6023
 Epoch 134/500
 10/10 0s 9ms/step -

```

accuracy: 0.7099 - loss: 0.6013 - val_accuracy: 0.7094 - val_loss: 0.6023
Epoch 135/500
10/10          0s 8ms/step -
accuracy: 0.7304 - loss: 0.5828 - val_accuracy: 0.7094 - val_loss: 0.6022
Epoch 136/500
10/10          0s 8ms/step -
accuracy: 0.6958 - loss: 0.6142 - val_accuracy: 0.7094 - val_loss: 0.6022
Epoch 137/500
10/10          0s 8ms/step -
accuracy: 0.7132 - loss: 0.5980 - val_accuracy: 0.7094 - val_loss: 0.6022
Epoch 138/500
10/10          0s 11ms/step -
accuracy: 0.6989 - loss: 0.6108 - val_accuracy: 0.7094 - val_loss: 0.6022
Epoch 139/500
10/10          0s 8ms/step -
accuracy: 0.7126 - loss: 0.5985 - val_accuracy: 0.7094 - val_loss: 0.6022
Epoch 140/500
10/10          0s 8ms/step -
accuracy: 0.7018 - loss: 0.6087 - val_accuracy: 0.7094 - val_loss: 0.6022
Epoch 141/500
10/10          0s 8ms/step -
accuracy: 0.7156 - loss: 0.5959 - val_accuracy: 0.7094 - val_loss: 0.6022
Epoch 142/500
10/10          0s 8ms/step -
accuracy: 0.7186 - loss: 0.5931 - val_accuracy: 0.7094 - val_loss: 0.6022
Epoch 143/500
10/10          0s 8ms/step -
accuracy: 0.7003 - loss: 0.6103 - val_accuracy: 0.7094 - val_loss: 0.6022
Epoch 144/500
10/10          0s 9ms/step -
accuracy: 0.7261 - loss: 0.5864 - val_accuracy: 0.7094 - val_loss: 0.6022
Epoch 145/500
10/10          0s 8ms/step -
accuracy: 0.7209 - loss: 0.5911 - val_accuracy: 0.7094 - val_loss: 0.6022
Epoch 146/500
10/10          0s 9ms/step -
accuracy: 0.7240 - loss: 0.5888 - val_accuracy: 0.7094 - val_loss: 0.6022
Epoch 147/500
10/10          0s 12ms/step -
accuracy: 0.7205 - loss: 0.5916 - val_accuracy: 0.7094 - val_loss: 0.6021
Epoch 148/500
10/10          0s 13ms/step -
accuracy: 0.7286 - loss: 0.5842 - val_accuracy: 0.7094 - val_loss: 0.6022
Epoch 149/500
10/10          0s 15ms/step -
accuracy: 0.7120 - loss: 0.5991 - val_accuracy: 0.7094 - val_loss: 0.6021
Epoch 150/500
10/10          0s 9ms/step -

```

accuracy: 0.6884 - loss: 0.6214 - val_accuracy: 0.7094 - val_loss: 0.6022
 Epoch 151/500
 10/10 0s 11ms/step -
 accuracy: 0.7208 - loss: 0.5912 - val_accuracy: 0.7094 - val_loss: 0.6021
 Epoch 152/500
 10/10 0s 10ms/step -
 accuracy: 0.7069 - loss: 0.6043 - val_accuracy: 0.7094 - val_loss: 0.6022
 Epoch 153/500
 10/10 0s 7ms/step -
 accuracy: 0.7094 - loss: 0.6016 - val_accuracy: 0.7094 - val_loss: 0.6021
 Epoch 154/500
 10/10 0s 7ms/step -
 accuracy: 0.7252 - loss: 0.5874 - val_accuracy: 0.7094 - val_loss: 0.6021
 Epoch 155/500
 10/10 0s 7ms/step -
 accuracy: 0.7328 - loss: 0.5801 - val_accuracy: 0.7094 - val_loss: 0.6021
 Epoch 156/500
 10/10 0s 7ms/step -
 accuracy: 0.7245 - loss: 0.5876 - val_accuracy: 0.7094 - val_loss: 0.6021
 Epoch 157/500
 10/10 0s 7ms/step -
 accuracy: 0.7225 - loss: 0.5897 - val_accuracy: 0.7094 - val_loss: 0.6021
 Epoch 158/500
 10/10 0s 8ms/step -
 accuracy: 0.7287 - loss: 0.5839 - val_accuracy: 0.7094 - val_loss: 0.6021
 Epoch 159/500
 10/10 0s 8ms/step -
 accuracy: 0.7358 - loss: 0.5775 - val_accuracy: 0.7094 - val_loss: 0.6021
 Epoch 160/500
 10/10 0s 8ms/step -
 accuracy: 0.7025 - loss: 0.6075 - val_accuracy: 0.7094 - val_loss: 0.6021
 Epoch 161/500
 10/10 0s 8ms/step -
 accuracy: 0.7013 - loss: 0.6091 - val_accuracy: 0.7094 - val_loss: 0.6021
 Epoch 162/500
 10/10 0s 9ms/step -
 accuracy: 0.7426 - loss: 0.5713 - val_accuracy: 0.7094 - val_loss: 0.6021
 Epoch 163/500
 10/10 0s 8ms/step -
 accuracy: 0.6935 - loss: 0.6159 - val_accuracy: 0.7094 - val_loss: 0.6020
 Epoch 164/500
 10/10 0s 8ms/step -
 accuracy: 0.7211 - loss: 0.5907 - val_accuracy: 0.7094 - val_loss: 0.6020
 Epoch 165/500
 10/10 0s 7ms/step -
 accuracy: 0.7075 - loss: 0.6028 - val_accuracy: 0.7094 - val_loss: 0.6020
 Epoch 166/500
 10/10 0s 8ms/step -

accuracy: 0.7261 - loss: 0.5864 - val_accuracy: 0.7094 - val_loss: 0.6020
 Epoch 167/500
 10/10 0s 7ms/step -
 accuracy: 0.7028 - loss: 0.6075 - val_accuracy: 0.7094 - val_loss: 0.6020
 Epoch 168/500
 10/10 0s 7ms/step -
 accuracy: 0.7039 - loss: 0.6067 - val_accuracy: 0.7094 - val_loss: 0.6020
 Epoch 169/500
 10/10 0s 7ms/step -
 accuracy: 0.6975 - loss: 0.6120 - val_accuracy: 0.7094 - val_loss: 0.6020
 Epoch 170/500
 10/10 0s 8ms/step -
 accuracy: 0.7417 - loss: 0.5717 - val_accuracy: 0.7094 - val_loss: 0.6020
 Epoch 171/500
 10/10 0s 8ms/step -
 accuracy: 0.6986 - loss: 0.6115 - val_accuracy: 0.7094 - val_loss: 0.6020
 Epoch 172/500
 10/10 0s 7ms/step -
 accuracy: 0.7104 - loss: 0.6006 - val_accuracy: 0.7094 - val_loss: 0.6020
 Epoch 173/500
 10/10 0s 7ms/step -
 accuracy: 0.7106 - loss: 0.6005 - val_accuracy: 0.7094 - val_loss: 0.6020
 Epoch 174/500
 10/10 0s 7ms/step -
 accuracy: 0.7040 - loss: 0.6067 - val_accuracy: 0.7094 - val_loss: 0.6020
 Epoch 175/500
 10/10 0s 7ms/step -
 accuracy: 0.7259 - loss: 0.5864 - val_accuracy: 0.7094 - val_loss: 0.6020
 Epoch 176/500
 10/10 0s 8ms/step -
 accuracy: 0.7254 - loss: 0.5870 - val_accuracy: 0.7094 - val_loss: 0.6020
 Epoch 177/500
 10/10 0s 7ms/step -
 accuracy: 0.7317 - loss: 0.5812 - val_accuracy: 0.7094 - val_loss: 0.6019
 Epoch 178/500
 10/10 0s 7ms/step -
 accuracy: 0.7221 - loss: 0.5896 - val_accuracy: 0.7094 - val_loss: 0.6019
 Epoch 179/500
 10/10 0s 7ms/step -
 accuracy: 0.6949 - loss: 0.6147 - val_accuracy: 0.7094 - val_loss: 0.6019
 Epoch 180/500
 10/10 0s 8ms/step -
 accuracy: 0.7311 - loss: 0.5817 - val_accuracy: 0.7094 - val_loss: 0.6019
 Epoch 181/500
 10/10 0s 7ms/step -
 accuracy: 0.7254 - loss: 0.5868 - val_accuracy: 0.7094 - val_loss: 0.6019
 Epoch 182/500
 10/10 0s 7ms/step -

accuracy: 0.7093 - loss: 0.6015 - val_accuracy: 0.7094 - val_loss: 0.6019
 Epoch 183/500
 10/10 0s 7ms/step -
 accuracy: 0.7274 - loss: 0.5850 - val_accuracy: 0.7094 - val_loss: 0.6019
 Epoch 184/500
 10/10 0s 7ms/step -
 accuracy: 0.7287 - loss: 0.5834 - val_accuracy: 0.7094 - val_loss: 0.6019
 Epoch 185/500
 10/10 0s 7ms/step -
 accuracy: 0.7222 - loss: 0.5900 - val_accuracy: 0.7094 - val_loss: 0.6019
 Epoch 186/500
 10/10 0s 8ms/step -
 accuracy: 0.7054 - loss: 0.6051 - val_accuracy: 0.7094 - val_loss: 0.6019
 Epoch 187/500
 10/10 0s 8ms/step -
 accuracy: 0.7305 - loss: 0.5817 - val_accuracy: 0.7094 - val_loss: 0.6018
 Epoch 188/500
 10/10 0s 7ms/step -
 accuracy: 0.7203 - loss: 0.5913 - val_accuracy: 0.7094 - val_loss: 0.6018
 Epoch 189/500
 10/10 0s 7ms/step -
 accuracy: 0.7163 - loss: 0.5951 - val_accuracy: 0.7094 - val_loss: 0.6018
 Epoch 190/500
 10/10 0s 7ms/step -
 accuracy: 0.7176 - loss: 0.5934 - val_accuracy: 0.7094 - val_loss: 0.6018
 Epoch 191/500
 10/10 0s 7ms/step -
 accuracy: 0.7385 - loss: 0.5746 - val_accuracy: 0.7094 - val_loss: 0.6018
 Epoch 192/500
 10/10 0s 7ms/step -
 accuracy: 0.7315 - loss: 0.5809 - val_accuracy: 0.7094 - val_loss: 0.6018
 Epoch 193/500
 10/10 0s 8ms/step -
 accuracy: 0.7238 - loss: 0.5884 - val_accuracy: 0.7094 - val_loss: 0.6018
 Epoch 194/500
 10/10 0s 7ms/step -
 accuracy: 0.6933 - loss: 0.6154 - val_accuracy: 0.7094 - val_loss: 0.6018
 Epoch 195/500
 10/10 0s 7ms/step -
 accuracy: 0.6949 - loss: 0.6139 - val_accuracy: 0.7094 - val_loss: 0.6018
 Epoch 196/500
 10/10 0s 7ms/step -
 accuracy: 0.7039 - loss: 0.6063 - val_accuracy: 0.7094 - val_loss: 0.6018
 Epoch 197/500
 10/10 0s 8ms/step -
 accuracy: 0.7188 - loss: 0.5924 - val_accuracy: 0.7094 - val_loss: 0.6018
 Epoch 198/500
 10/10 0s 7ms/step -

accuracy: 0.7208 - loss: 0.5912 - val_accuracy: 0.7094 - val_loss: 0.6018
 Epoch 199/500
 10/10 0s 7ms/step -
 accuracy: 0.7058 - loss: 0.6046 - val_accuracy: 0.7094 - val_loss: 0.6017
 Epoch 200/500
 10/10 0s 7ms/step -
 accuracy: 0.7141 - loss: 0.5969 - val_accuracy: 0.7094 - val_loss: 0.6017
 Epoch 201/500
 10/10 0s 8ms/step -
 accuracy: 0.7157 - loss: 0.5956 - val_accuracy: 0.7094 - val_loss: 0.6017
 Epoch 202/500
 10/10 0s 8ms/step -
 accuracy: 0.7324 - loss: 0.5808 - val_accuracy: 0.7094 - val_loss: 0.6017
 Epoch 203/500
 10/10 0s 7ms/step -
 accuracy: 0.7448 - loss: 0.5690 - val_accuracy: 0.7094 - val_loss: 0.6017
 Epoch 204/500
 10/10 0s 7ms/step -
 accuracy: 0.7026 - loss: 0.6075 - val_accuracy: 0.7094 - val_loss: 0.6017
 Epoch 205/500
 10/10 0s 7ms/step -
 accuracy: 0.6695 - loss: 0.6371 - val_accuracy: 0.7094 - val_loss: 0.6017
 Epoch 206/500
 10/10 0s 7ms/step -
 accuracy: 0.6979 - loss: 0.6113 - val_accuracy: 0.7094 - val_loss: 0.6017
 Epoch 207/500
 10/10 0s 7ms/step -
 accuracy: 0.7103 - loss: 0.6007 - val_accuracy: 0.7094 - val_loss: 0.6017
 Epoch 208/500
 10/10 0s 7ms/step -
 accuracy: 0.7083 - loss: 0.6023 - val_accuracy: 0.7094 - val_loss: 0.6017
 Epoch 209/500
 10/10 0s 7ms/step -
 accuracy: 0.7115 - loss: 0.5992 - val_accuracy: 0.7094 - val_loss: 0.6017
 Epoch 210/500
 10/10 0s 7ms/step -
 accuracy: 0.7245 - loss: 0.5876 - val_accuracy: 0.7094 - val_loss: 0.6017
 Epoch 211/500
 10/10 0s 7ms/step -
 accuracy: 0.7241 - loss: 0.5877 - val_accuracy: 0.7094 - val_loss: 0.6017
 Epoch 212/500
 10/10 0s 7ms/step -
 accuracy: 0.7381 - loss: 0.5748 - val_accuracy: 0.7094 - val_loss: 0.6017
 Epoch 213/500
 10/10 0s 7ms/step -
 accuracy: 0.7214 - loss: 0.5898 - val_accuracy: 0.7094 - val_loss: 0.6017
 Epoch 214/500
 10/10 0s 7ms/step -

accuracy: 0.7268 - loss: 0.5854 - val_accuracy: 0.7094 - val_loss: 0.6017
 Epoch 215/500
 10/10 0s 8ms/step -
 accuracy: 0.7143 - loss: 0.5966 - val_accuracy: 0.7094 - val_loss: 0.6016
 Epoch 216/500
 10/10 0s 8ms/step -
 accuracy: 0.7377 - loss: 0.5756 - val_accuracy: 0.7094 - val_loss: 0.6016
 Epoch 217/500
 10/10 0s 8ms/step -
 accuracy: 0.7228 - loss: 0.5891 - val_accuracy: 0.7094 - val_loss: 0.6016
 Epoch 218/500
 10/10 0s 8ms/step -
 accuracy: 0.7176 - loss: 0.5932 - val_accuracy: 0.7094 - val_loss: 0.6016
 Epoch 219/500
 10/10 0s 8ms/step -
 accuracy: 0.7427 - loss: 0.5705 - val_accuracy: 0.7094 - val_loss: 0.6016
 Epoch 220/500
 10/10 0s 8ms/step -
 accuracy: 0.6956 - loss: 0.6133 - val_accuracy: 0.7094 - val_loss: 0.6016
 Epoch 221/500
 10/10 0s 8ms/step -
 accuracy: 0.7154 - loss: 0.5954 - val_accuracy: 0.7094 - val_loss: 0.6016
 Epoch 222/500
 10/10 0s 8ms/step -
 accuracy: 0.7137 - loss: 0.5973 - val_accuracy: 0.7094 - val_loss: 0.6016
 Epoch 223/500
 10/10 0s 8ms/step -
 accuracy: 0.7189 - loss: 0.5923 - val_accuracy: 0.7094 - val_loss: 0.6016
 Epoch 224/500
 10/10 0s 8ms/step -
 accuracy: 0.7085 - loss: 0.6018 - val_accuracy: 0.7094 - val_loss: 0.6016
 Epoch 225/500
 10/10 0s 7ms/step -
 accuracy: 0.7363 - loss: 0.5767 - val_accuracy: 0.7094 - val_loss: 0.6016
 Epoch 226/500
 10/10 0s 7ms/step -
 accuracy: 0.7197 - loss: 0.5919 - val_accuracy: 0.7094 - val_loss: 0.6016
 Epoch 227/500
 10/10 0s 7ms/step -
 accuracy: 0.7144 - loss: 0.5968 - val_accuracy: 0.7094 - val_loss: 0.6016
 Epoch 228/500
 10/10 0s 7ms/step -
 accuracy: 0.7485 - loss: 0.5654 - val_accuracy: 0.7094 - val_loss: 0.6016
 Epoch 229/500
 10/10 0s 8ms/step -
 accuracy: 0.7338 - loss: 0.5787 - val_accuracy: 0.7094 - val_loss: 0.6015
 Epoch 230/500
 10/10 0s 8ms/step -

accuracy: 0.7253 - loss: 0.5862 - val_accuracy: 0.7094 - val_loss: 0.6015
 Epoch 231/500
 10/10 0s 7ms/step -
 accuracy: 0.7101 - loss: 0.6003 - val_accuracy: 0.7094 - val_loss: 0.6015
 Epoch 232/500
 10/10 0s 8ms/step -
 accuracy: 0.7069 - loss: 0.6033 - val_accuracy: 0.7094 - val_loss: 0.6015
 Epoch 233/500
 10/10 0s 9ms/step -
 accuracy: 0.7060 - loss: 0.6044 - val_accuracy: 0.7094 - val_loss: 0.6015
 Epoch 234/500
 10/10 0s 8ms/step -
 accuracy: 0.7256 - loss: 0.5861 - val_accuracy: 0.7094 - val_loss: 0.6015
 Epoch 235/500
 10/10 0s 9ms/step -
 accuracy: 0.7202 - loss: 0.5912 - val_accuracy: 0.7094 - val_loss: 0.6015
 Epoch 236/500
 10/10 0s 9ms/step -
 accuracy: 0.7171 - loss: 0.5940 - val_accuracy: 0.7094 - val_loss: 0.6015
 Epoch 237/500
 10/10 0s 7ms/step -
 accuracy: 0.7022 - loss: 0.6075 - val_accuracy: 0.7094 - val_loss: 0.6015
 Epoch 238/500
 10/10 0s 8ms/step -
 accuracy: 0.6717 - loss: 0.6351 - val_accuracy: 0.7094 - val_loss: 0.6015
 Epoch 239/500
 10/10 0s 7ms/step -
 accuracy: 0.7204 - loss: 0.5905 - val_accuracy: 0.7094 - val_loss: 0.6015
 Epoch 240/500
 10/10 0s 8ms/step -
 accuracy: 0.7077 - loss: 0.6022 - val_accuracy: 0.7094 - val_loss: 0.6015
 Epoch 241/500
 10/10 0s 7ms/step -
 accuracy: 0.7307 - loss: 0.5817 - val_accuracy: 0.7094 - val_loss: 0.6015
 Epoch 242/500
 10/10 0s 8ms/step -
 accuracy: 0.7376 - loss: 0.5751 - val_accuracy: 0.7094 - val_loss: 0.6014
 Epoch 243/500
 10/10 0s 7ms/step -
 accuracy: 0.7307 - loss: 0.5814 - val_accuracy: 0.7094 - val_loss: 0.6014
 Epoch 244/500
 10/10 0s 8ms/step -
 accuracy: 0.7279 - loss: 0.5839 - val_accuracy: 0.7094 - val_loss: 0.6014
 Epoch 245/500
 10/10 0s 8ms/step -
 accuracy: 0.6795 - loss: 0.6280 - val_accuracy: 0.7094 - val_loss: 0.6014
 Epoch 246/500
 10/10 0s 8ms/step -

accuracy: 0.7386 - loss: 0.5740 - val_accuracy: 0.7094 - val_loss: 0.6014
 Epoch 247/500
 10/10 0s 9ms/step -
 accuracy: 0.7083 - loss: 0.6018 - val_accuracy: 0.7094 - val_loss: 0.6014
 Epoch 248/500
 10/10 0s 8ms/step -
 accuracy: 0.7067 - loss: 0.6031 - val_accuracy: 0.7094 - val_loss: 0.6014
 Epoch 249/500
 10/10 0s 8ms/step -
 accuracy: 0.7163 - loss: 0.5947 - val_accuracy: 0.7094 - val_loss: 0.6014
 Epoch 250/500
 10/10 0s 8ms/step -
 accuracy: 0.7377 - loss: 0.5751 - val_accuracy: 0.7094 - val_loss: 0.6014
 Epoch 251/500
 10/10 0s 8ms/step -
 accuracy: 0.7143 - loss: 0.5962 - val_accuracy: 0.7094 - val_loss: 0.6014
 Epoch 252/500
 10/10 0s 7ms/step -
 accuracy: 0.7013 - loss: 0.6086 - val_accuracy: 0.7094 - val_loss: 0.6014
 Epoch 253/500
 10/10 0s 7ms/step -
 accuracy: 0.7165 - loss: 0.5946 - val_accuracy: 0.7094 - val_loss: 0.6013
 Epoch 254/500
 10/10 0s 7ms/step -
 accuracy: 0.7072 - loss: 0.6026 - val_accuracy: 0.7094 - val_loss: 0.6013
 Epoch 255/500
 10/10 0s 8ms/step -
 accuracy: 0.7402 - loss: 0.5727 - val_accuracy: 0.7094 - val_loss: 0.6013
 Epoch 256/500
 10/10 0s 8ms/step -
 accuracy: 0.7198 - loss: 0.5915 - val_accuracy: 0.7094 - val_loss: 0.6013
 Epoch 257/500
 10/10 0s 8ms/step -
 accuracy: 0.7339 - loss: 0.5782 - val_accuracy: 0.7094 - val_loss: 0.6013
 Epoch 258/500
 10/10 0s 8ms/step -
 accuracy: 0.7268 - loss: 0.5847 - val_accuracy: 0.7094 - val_loss: 0.6013
 Epoch 259/500
 10/10 0s 8ms/step -
 accuracy: 0.7026 - loss: 0.6068 - val_accuracy: 0.7094 - val_loss: 0.6013
 Epoch 260/500
 10/10 0s 8ms/step -
 accuracy: 0.6935 - loss: 0.6147 - val_accuracy: 0.7094 - val_loss: 0.6013
 Epoch 261/500
 10/10 0s 7ms/step -
 accuracy: 0.7084 - loss: 0.6021 - val_accuracy: 0.7094 - val_loss: 0.6013
 Epoch 262/500
 10/10 0s 7ms/step -

accuracy: 0.7198 - loss: 0.5907 - val_accuracy: 0.7094 - val_loss: 0.6013
 Epoch 263/500
 10/10 0s 7ms/step -
 accuracy: 0.7259 - loss: 0.5850 - val_accuracy: 0.7094 - val_loss: 0.6013
 Epoch 264/500
 10/10 0s 7ms/step -
 accuracy: 0.7047 - loss: 0.6048 - val_accuracy: 0.7094 - val_loss: 0.6013
 Epoch 265/500
 10/10 0s 7ms/step -
 accuracy: 0.7260 - loss: 0.5854 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 266/500
 10/10 0s 7ms/step -
 accuracy: 0.7252 - loss: 0.5867 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 267/500
 10/10 0s 8ms/step -
 accuracy: 0.7192 - loss: 0.5919 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 268/500
 10/10 0s 8ms/step -
 accuracy: 0.7305 - loss: 0.5816 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 269/500
 10/10 0s 7ms/step -
 accuracy: 0.7054 - loss: 0.6038 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 270/500
 10/10 0s 8ms/step -
 accuracy: 0.7084 - loss: 0.6017 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 271/500
 10/10 0s 7ms/step -
 accuracy: 0.6988 - loss: 0.6103 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 272/500
 10/10 0s 7ms/step -
 accuracy: 0.7211 - loss: 0.5893 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 273/500
 10/10 0s 8ms/step -
 accuracy: 0.6988 - loss: 0.6104 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 274/500
 10/10 0s 7ms/step -
 accuracy: 0.7287 - loss: 0.5831 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 275/500
 10/10 0s 13ms/step -
 accuracy: 0.7061 - loss: 0.6040 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 276/500
 10/10 0s 8ms/step -
 accuracy: 0.6997 - loss: 0.6097 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 277/500
 10/10 0s 8ms/step -
 accuracy: 0.7071 - loss: 0.6029 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 278/500
 10/10 0s 9ms/step -

accuracy: 0.7332 - loss: 0.5789 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 279/500
 10/10 0s 8ms/step -
 accuracy: 0.7243 - loss: 0.5871 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 280/500
 10/10 0s 7ms/step -
 accuracy: 0.7004 - loss: 0.6088 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 281/500
 10/10 0s 8ms/step -
 accuracy: 0.6935 - loss: 0.6147 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 282/500
 10/10 0s 7ms/step -
 accuracy: 0.6967 - loss: 0.6120 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 283/500
 10/10 0s 7ms/step -
 accuracy: 0.7631 - loss: 0.5514 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 284/500
 10/10 0s 7ms/step -
 accuracy: 0.7080 - loss: 0.6020 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 285/500
 10/10 0s 7ms/step -
 accuracy: 0.7117 - loss: 0.5985 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 286/500
 10/10 0s 8ms/step -
 accuracy: 0.7209 - loss: 0.5894 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 287/500
 10/10 0s 7ms/step -
 accuracy: 0.7183 - loss: 0.5921 - val_accuracy: 0.7094 - val_loss: 0.6011
 Epoch 288/500
 10/10 0s 8ms/step -
 accuracy: 0.6832 - loss: 0.6247 - val_accuracy: 0.7094 - val_loss: 0.6012
 Epoch 289/500
 10/10 0s 7ms/step -
 accuracy: 0.7443 - loss: 0.5681 - val_accuracy: 0.7094 - val_loss: 0.6011
 Epoch 290/500
 10/10 0s 8ms/step -
 accuracy: 0.7094 - loss: 0.6006 - val_accuracy: 0.7094 - val_loss: 0.6011
 Epoch 291/500
 10/10 0s 7ms/step -
 accuracy: 0.7029 - loss: 0.6063 - val_accuracy: 0.7094 - val_loss: 0.6011
 Epoch 292/500
 10/10 0s 7ms/step -
 accuracy: 0.7304 - loss: 0.5815 - val_accuracy: 0.7094 - val_loss: 0.6011
 Epoch 293/500
 10/10 0s 7ms/step -
 accuracy: 0.7179 - loss: 0.5927 - val_accuracy: 0.7094 - val_loss: 0.6011
 Epoch 294/500
 10/10 0s 7ms/step -

```

accuracy: 0.7091 - loss: 0.6009 - val_accuracy: 0.7094 - val_loss: 0.6011
Epoch 295/500
10/10          0s 8ms/step -
accuracy: 0.7025 - loss: 0.6065 - val_accuracy: 0.7094 - val_loss: 0.6011
Epoch 296/500
10/10          0s 8ms/step -
accuracy: 0.6942 - loss: 0.6146 - val_accuracy: 0.7094 - val_loss: 0.6011
Epoch 297/500
10/10          0s 8ms/step -
accuracy: 0.7248 - loss: 0.5862 - val_accuracy: 0.7094 - val_loss: 0.6011
Epoch 298/500
10/10          0s 9ms/step -
accuracy: 0.6747 - loss: 0.6322 - val_accuracy: 0.7094 - val_loss: 0.6010
Epoch 299/500
10/10          0s 12ms/step -
accuracy: 0.7314 - loss: 0.5802 - val_accuracy: 0.7094 - val_loss: 0.6010
Epoch 300/500
10/10          0s 8ms/step -
accuracy: 0.7126 - loss: 0.5975 - val_accuracy: 0.7094 - val_loss: 0.6010
Epoch 301/500
10/10          0s 7ms/step -
accuracy: 0.7147 - loss: 0.5958 - val_accuracy: 0.7094 - val_loss: 0.6010
Epoch 302/500
10/10          0s 7ms/step -
accuracy: 0.7207 - loss: 0.5904 - val_accuracy: 0.7094 - val_loss: 0.6010
Epoch 303/500
10/10          0s 7ms/step -
accuracy: 0.7080 - loss: 0.6020 - val_accuracy: 0.7094 - val_loss: 0.6010
Epoch 304/500
10/10          0s 8ms/step -
accuracy: 0.7381 - loss: 0.5742 - val_accuracy: 0.7094 - val_loss: 0.6010
Epoch 305/500
10/10          0s 8ms/step -
accuracy: 0.7067 - loss: 0.6026 - val_accuracy: 0.7094 - val_loss: 0.6010
Epoch 306/500
10/10          0s 7ms/step -
accuracy: 0.7314 - loss: 0.5802 - val_accuracy: 0.7094 - val_loss: 0.6010
Epoch 307/500
10/10          0s 7ms/step -
accuracy: 0.7281 - loss: 0.5837 - val_accuracy: 0.7094 - val_loss: 0.6010
Epoch 308/500
10/10          0s 8ms/step -
accuracy: 0.6859 - loss: 0.6220 - val_accuracy: 0.7094 - val_loss: 0.6010
Epoch 309/500
10/10          0s 9ms/step -
accuracy: 0.6910 - loss: 0.6168 - val_accuracy: 0.7094 - val_loss: 0.6010
Epoch 310/500
10/10          0s 8ms/step -

```

accuracy: 0.7161 - loss: 0.5943 - val_accuracy: 0.7094 - val_loss: 0.6009
 Epoch 311/500
 10/10 0s 8ms/step -
 accuracy: 0.7043 - loss: 0.6052 - val_accuracy: 0.7094 - val_loss: 0.6009
 Epoch 312/500
 10/10 0s 8ms/step -
 accuracy: 0.6835 - loss: 0.6242 - val_accuracy: 0.7094 - val_loss: 0.6009
 Epoch 313/500
 10/10 0s 8ms/step -
 accuracy: 0.7274 - loss: 0.5841 - val_accuracy: 0.7094 - val_loss: 0.6009
 Epoch 314/500
 10/10 0s 9ms/step -
 accuracy: 0.7228 - loss: 0.5883 - val_accuracy: 0.7094 - val_loss: 0.6009
 Epoch 315/500
 10/10 0s 8ms/step -
 accuracy: 0.6983 - loss: 0.6100 - val_accuracy: 0.7094 - val_loss: 0.6009
 Epoch 316/500
 10/10 0s 9ms/step -
 accuracy: 0.7055 - loss: 0.6038 - val_accuracy: 0.7094 - val_loss: 0.6009
 Epoch 317/500
 10/10 0s 8ms/step -
 accuracy: 0.7099 - loss: 0.5996 - val_accuracy: 0.7094 - val_loss: 0.6009
 Epoch 318/500
 10/10 0s 8ms/step -
 accuracy: 0.6998 - loss: 0.6090 - val_accuracy: 0.7094 - val_loss: 0.6009
 Epoch 319/500
 10/10 0s 8ms/step -
 accuracy: 0.7175 - loss: 0.5925 - val_accuracy: 0.7094 - val_loss: 0.6009
 Epoch 320/500
 10/10 0s 8ms/step -
 accuracy: 0.6982 - loss: 0.6104 - val_accuracy: 0.7094 - val_loss: 0.6009
 Epoch 321/500
 10/10 0s 8ms/step -
 accuracy: 0.7129 - loss: 0.5970 - val_accuracy: 0.7094 - val_loss: 0.6009
 Epoch 322/500
 10/10 0s 7ms/step -
 accuracy: 0.7120 - loss: 0.5976 - val_accuracy: 0.7094 - val_loss: 0.6009
 Epoch 323/500
 10/10 0s 7ms/step -
 accuracy: 0.7056 - loss: 0.6044 - val_accuracy: 0.7094 - val_loss: 0.6009
 Epoch 324/500
 10/10 0s 7ms/step -
 accuracy: 0.7172 - loss: 0.5928 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 325/500
 10/10 0s 11ms/step -
 accuracy: 0.7143 - loss: 0.5950 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 326/500
 10/10 0s 8ms/step -

accuracy: 0.6966 - loss: 0.6117 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 327/500
 10/10 0s 8ms/step -
 accuracy: 0.6875 - loss: 0.6208 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 328/500
 10/10 0s 7ms/step -
 accuracy: 0.7250 - loss: 0.5862 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 329/500
 10/10 0s 7ms/step -
 accuracy: 0.7532 - loss: 0.5601 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 330/500
 10/10 0s 8ms/step -
 accuracy: 0.7212 - loss: 0.5889 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 331/500
 10/10 0s 8ms/step -
 accuracy: 0.7051 - loss: 0.6039 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 332/500
 10/10 0s 7ms/step -
 accuracy: 0.7014 - loss: 0.6072 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 333/500
 10/10 0s 7ms/step -
 accuracy: 0.7167 - loss: 0.5937 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 334/500
 10/10 0s 7ms/step -
 accuracy: 0.7074 - loss: 0.6019 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 335/500
 10/10 0s 7ms/step -
 accuracy: 0.6972 - loss: 0.6113 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 336/500
 10/10 0s 7ms/step -
 accuracy: 0.7092 - loss: 0.6001 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 337/500
 10/10 0s 7ms/step -
 accuracy: 0.6865 - loss: 0.6212 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 338/500
 10/10 0s 7ms/step -
 accuracy: 0.7181 - loss: 0.5917 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 339/500
 10/10 0s 8ms/step -
 accuracy: 0.7110 - loss: 0.5988 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 340/500
 10/10 0s 9ms/step -
 accuracy: 0.7160 - loss: 0.5939 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 341/500
 10/10 0s 8ms/step -
 accuracy: 0.7135 - loss: 0.5961 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 342/500
 10/10 0s 7ms/step -

accuracy: 0.7278 - loss: 0.5839 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 343/500
 10/10 0s 8ms/step -
 accuracy: 0.7189 - loss: 0.5914 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 344/500
 10/10 0s 8ms/step -
 accuracy: 0.7302 - loss: 0.5815 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 345/500
 10/10 0s 8ms/step -
 accuracy: 0.6931 - loss: 0.6155 - val_accuracy: 0.7094 - val_loss: 0.6007
 Epoch 346/500
 10/10 0s 8ms/step -
 accuracy: 0.7077 - loss: 0.6021 - val_accuracy: 0.7094 - val_loss: 0.6007
 Epoch 347/500
 10/10 0s 8ms/step -
 accuracy: 0.7090 - loss: 0.6003 - val_accuracy: 0.7094 - val_loss: 0.6007
 Epoch 348/500
 10/10 0s 9ms/step -
 accuracy: 0.7388 - loss: 0.5724 - val_accuracy: 0.7094 - val_loss: 0.6007
 Epoch 349/500
 10/10 0s 8ms/step -
 accuracy: 0.7166 - loss: 0.5935 - val_accuracy: 0.7094 - val_loss: 0.6007
 Epoch 350/500
 10/10 0s 8ms/step -
 accuracy: 0.6986 - loss: 0.6098 - val_accuracy: 0.7094 - val_loss: 0.6007
 Epoch 351/500
 10/10 0s 8ms/step -
 accuracy: 0.7257 - loss: 0.5849 - val_accuracy: 0.7094 - val_loss: 0.6007
 Epoch 352/500
 10/10 0s 8ms/step -
 accuracy: 0.7082 - loss: 0.6012 - val_accuracy: 0.7094 - val_loss: 0.6007
 Epoch 353/500
 10/10 0s 8ms/step -
 accuracy: 0.7051 - loss: 0.6048 - val_accuracy: 0.7094 - val_loss: 0.6007
 Epoch 354/500
 10/10 0s 7ms/step -
 accuracy: 0.7291 - loss: 0.5814 - val_accuracy: 0.7094 - val_loss: 0.6007
 Epoch 355/500
 10/10 0s 8ms/step -
 accuracy: 0.6967 - loss: 0.6113 - val_accuracy: 0.7094 - val_loss: 0.6007
 Epoch 356/500
 10/10 0s 11ms/step -
 accuracy: 0.7433 - loss: 0.5683 - val_accuracy: 0.7094 - val_loss: 0.6007
 Epoch 357/500
 10/10 0s 9ms/step -
 accuracy: 0.7246 - loss: 0.5857 - val_accuracy: 0.7094 - val_loss: 0.6007
 Epoch 358/500
 10/10 0s 12ms/step -

```

accuracy: 0.6969 - loss: 0.6109 - val_accuracy: 0.7094 - val_loss: 0.6007
Epoch 359/500
10/10          0s 9ms/step -
accuracy: 0.6971 - loss: 0.6118 - val_accuracy: 0.7094 - val_loss: 0.6007
Epoch 360/500
10/10          0s 8ms/step -
accuracy: 0.7181 - loss: 0.5919 - val_accuracy: 0.7094 - val_loss: 0.6007
Epoch 361/500
10/10          0s 8ms/step -
accuracy: 0.7273 - loss: 0.5838 - val_accuracy: 0.7094 - val_loss: 0.6007
Epoch 362/500
10/10          0s 8ms/step -
accuracy: 0.7331 - loss: 0.5777 - val_accuracy: 0.7094 - val_loss: 0.6007
Epoch 363/500
10/10          0s 8ms/step -
accuracy: 0.7437 - loss: 0.5676 - val_accuracy: 0.7094 - val_loss: 0.6006
Epoch 364/500
10/10          0s 7ms/step -
accuracy: 0.6962 - loss: 0.6123 - val_accuracy: 0.7094 - val_loss: 0.6006
Epoch 365/500
10/10          0s 7ms/step -
accuracy: 0.7045 - loss: 0.6040 - val_accuracy: 0.7094 - val_loss: 0.6006
Epoch 366/500
10/10          0s 7ms/step -
accuracy: 0.7128 - loss: 0.5963 - val_accuracy: 0.7094 - val_loss: 0.6006
Epoch 367/500
10/10          0s 7ms/step -
accuracy: 0.7074 - loss: 0.6015 - val_accuracy: 0.7094 - val_loss: 0.6006
Epoch 368/500
10/10          0s 9ms/step -
accuracy: 0.7028 - loss: 0.6060 - val_accuracy: 0.7094 - val_loss: 0.6006
Epoch 369/500
10/10          0s 16ms/step -
accuracy: 0.6997 - loss: 0.6090 - val_accuracy: 0.7094 - val_loss: 0.6006
Epoch 370/500
10/10          0s 13ms/step -
accuracy: 0.7405 - loss: 0.5706 - val_accuracy: 0.7094 - val_loss: 0.6006
Epoch 371/500
10/10          0s 9ms/step -
accuracy: 0.7160 - loss: 0.5938 - val_accuracy: 0.7094 - val_loss: 0.6006
Epoch 372/500
10/10          0s 10ms/step -
accuracy: 0.7240 - loss: 0.5868 - val_accuracy: 0.7094 - val_loss: 0.6005
Epoch 373/500
10/10          0s 13ms/step -
accuracy: 0.7177 - loss: 0.5920 - val_accuracy: 0.7094 - val_loss: 0.6006
Epoch 374/500
10/10          0s 9ms/step -

```

accuracy: 0.7191 - loss: 0.5912 - val_accuracy: 0.7094 - val_loss: 0.6006
 Epoch 375/500
 10/10 0s 9ms/step -
 accuracy: 0.7084 - loss: 0.6005 - val_accuracy: 0.7094 - val_loss: 0.6006
 Epoch 376/500
 10/10 0s 8ms/step -
 accuracy: 0.7112 - loss: 0.5986 - val_accuracy: 0.7094 - val_loss: 0.6006
 Epoch 377/500
 10/10 0s 8ms/step -
 accuracy: 0.7273 - loss: 0.5831 - val_accuracy: 0.7094 - val_loss: 0.6005
 Epoch 378/500
 10/10 0s 9ms/step -
 accuracy: 0.6985 - loss: 0.6100 - val_accuracy: 0.7094 - val_loss: 0.6005
 Epoch 379/500
 10/10 0s 19ms/step -
 accuracy: 0.7035 - loss: 0.6048 - val_accuracy: 0.7094 - val_loss: 0.6005
 Epoch 380/500
 10/10 0s 11ms/step -
 accuracy: 0.7259 - loss: 0.5843 - val_accuracy: 0.7094 - val_loss: 0.6005
 Epoch 381/500
 10/10 0s 9ms/step -
 accuracy: 0.7190 - loss: 0.5914 - val_accuracy: 0.7094 - val_loss: 0.6005
 Epoch 382/500
 10/10 0s 11ms/step -
 accuracy: 0.7208 - loss: 0.5894 - val_accuracy: 0.7094 - val_loss: 0.6005
 Epoch 383/500
 10/10 0s 12ms/step -
 accuracy: 0.7392 - loss: 0.5725 - val_accuracy: 0.7094 - val_loss: 0.6005
 Epoch 384/500
 10/10 0s 9ms/step -
 accuracy: 0.7137 - loss: 0.5955 - val_accuracy: 0.7094 - val_loss: 0.6005
 Epoch 385/500
 10/10 0s 8ms/step -
 accuracy: 0.7181 - loss: 0.5924 - val_accuracy: 0.7094 - val_loss: 0.6005
 Epoch 386/500
 10/10 0s 8ms/step -
 accuracy: 0.7195 - loss: 0.5905 - val_accuracy: 0.7094 - val_loss: 0.6005
 Epoch 387/500
 10/10 0s 8ms/step -
 accuracy: 0.7209 - loss: 0.5893 - val_accuracy: 0.7094 - val_loss: 0.6005
 Epoch 388/500
 10/10 0s 8ms/step -
 accuracy: 0.7176 - loss: 0.5925 - val_accuracy: 0.7094 - val_loss: 0.6005
 Epoch 389/500
 10/10 0s 16ms/step -
 accuracy: 0.7133 - loss: 0.5963 - val_accuracy: 0.7094 - val_loss: 0.6005
 Epoch 390/500
 10/10 0s 9ms/step -

accuracy: 0.7084 - loss: 0.6004 - val_accuracy: 0.7094 - val_loss: 0.6004
 Epoch 391/500
 10/10 0s 12ms/step -
 accuracy: 0.7245 - loss: 0.5856 - val_accuracy: 0.7094 - val_loss: 0.6004
 Epoch 392/500
 10/10 0s 9ms/step -
 accuracy: 0.7070 - loss: 0.6027 - val_accuracy: 0.7094 - val_loss: 0.6004
 Epoch 393/500
 10/10 0s 9ms/step -
 accuracy: 0.7119 - loss: 0.5967 - val_accuracy: 0.7094 - val_loss: 0.6004
 Epoch 394/500
 10/10 0s 8ms/step -
 accuracy: 0.7333 - loss: 0.5775 - val_accuracy: 0.7094 - val_loss: 0.6004
 Epoch 395/500
 10/10 0s 8ms/step -
 accuracy: 0.7298 - loss: 0.5803 - val_accuracy: 0.7094 - val_loss: 0.6003
 Epoch 396/500
 10/10 0s 8ms/step -
 accuracy: 0.7110 - loss: 0.5977 - val_accuracy: 0.7094 - val_loss: 0.6003
 Epoch 397/500
 10/10 0s 8ms/step -
 accuracy: 0.7157 - loss: 0.5939 - val_accuracy: 0.7094 - val_loss: 0.6003
 Epoch 398/500
 10/10 0s 9ms/step -
 accuracy: 0.6967 - loss: 0.6119 - val_accuracy: 0.7094 - val_loss: 0.6003
 Epoch 399/500
 10/10 0s 10ms/step -
 accuracy: 0.7209 - loss: 0.5890 - val_accuracy: 0.7094 - val_loss: 0.6003
 Epoch 400/500
 10/10 0s 8ms/step -
 accuracy: 0.7401 - loss: 0.5717 - val_accuracy: 0.7094 - val_loss: 0.6003
 Epoch 401/500
 10/10 0s 8ms/step -
 accuracy: 0.7316 - loss: 0.5793 - val_accuracy: 0.7094 - val_loss: 0.6003
 Epoch 402/500
 10/10 0s 13ms/step -
 accuracy: 0.7058 - loss: 0.6027 - val_accuracy: 0.7094 - val_loss: 0.6003
 Epoch 403/500
 10/10 0s 9ms/step -
 accuracy: 0.7398 - loss: 0.5721 - val_accuracy: 0.7094 - val_loss: 0.6003
 Epoch 404/500
 10/10 0s 8ms/step -
 accuracy: 0.6961 - loss: 0.6115 - val_accuracy: 0.7094 - val_loss: 0.6003
 Epoch 405/500
 10/10 0s 8ms/step -
 accuracy: 0.7176 - loss: 0.5917 - val_accuracy: 0.7094 - val_loss: 0.6003
 Epoch 406/500
 10/10 0s 7ms/step -

accuracy: 0.6977 - loss: 0.6099 - val_accuracy: 0.7094 - val_loss: 0.6003
 Epoch 407/500
 10/10 0s 8ms/step -
 accuracy: 0.7352 - loss: 0.5763 - val_accuracy: 0.7094 - val_loss: 0.6002
 Epoch 408/500
 10/10 0s 8ms/step -
 accuracy: 0.7194 - loss: 0.5904 - val_accuracy: 0.7094 - val_loss: 0.6002
 Epoch 409/500
 10/10 0s 8ms/step -
 accuracy: 0.7242 - loss: 0.5855 - val_accuracy: 0.7094 - val_loss: 0.6002
 Epoch 410/500
 10/10 0s 8ms/step -
 accuracy: 0.7301 - loss: 0.5811 - val_accuracy: 0.7094 - val_loss: 0.6002
 Epoch 411/500
 10/10 0s 8ms/step -
 accuracy: 0.7000 - loss: 0.6079 - val_accuracy: 0.7094 - val_loss: 0.6002
 Epoch 412/500
 10/10 0s 8ms/step -
 accuracy: 0.6913 - loss: 0.6151 - val_accuracy: 0.7094 - val_loss: 0.6002
 Epoch 413/500
 10/10 0s 8ms/step -
 accuracy: 0.7342 - loss: 0.5767 - val_accuracy: 0.7094 - val_loss: 0.6002
 Epoch 414/500
 10/10 0s 9ms/step -
 accuracy: 0.7073 - loss: 0.6016 - val_accuracy: 0.7094 - val_loss: 0.6002
 Epoch 415/500
 10/10 0s 8ms/step -
 accuracy: 0.7160 - loss: 0.5935 - val_accuracy: 0.7094 - val_loss: 0.6002
 Epoch 416/500
 10/10 0s 16ms/step -
 accuracy: 0.7346 - loss: 0.5767 - val_accuracy: 0.7094 - val_loss: 0.6002
 Epoch 417/500
 10/10 0s 8ms/step -
 accuracy: 0.7207 - loss: 0.5895 - val_accuracy: 0.7094 - val_loss: 0.6001
 Epoch 418/500
 10/10 0s 8ms/step -
 accuracy: 0.7089 - loss: 0.5993 - val_accuracy: 0.7094 - val_loss: 0.6001
 Epoch 419/500
 10/10 0s 7ms/step -
 accuracy: 0.7296 - loss: 0.5813 - val_accuracy: 0.7094 - val_loss: 0.6001
 Epoch 420/500
 10/10 0s 8ms/step -
 accuracy: 0.7099 - loss: 0.5987 - val_accuracy: 0.7094 - val_loss: 0.6001
 Epoch 421/500
 10/10 0s 7ms/step -
 accuracy: 0.7246 - loss: 0.5858 - val_accuracy: 0.7094 - val_loss: 0.6001
 Epoch 422/500
 10/10 0s 7ms/step -

accuracy: 0.7130 - loss: 0.5960 - val_accuracy: 0.7094 - val_loss: 0.6001
 Epoch 423/500
 10/10 0s 8ms/step -
 accuracy: 0.7171 - loss: 0.5926 - val_accuracy: 0.7094 - val_loss: 0.6001
 Epoch 424/500
 10/10 0s 9ms/step -
 accuracy: 0.7386 - loss: 0.5720 - val_accuracy: 0.7094 - val_loss: 0.6001
 Epoch 425/500
 10/10 0s 8ms/step -
 accuracy: 0.7288 - loss: 0.5819 - val_accuracy: 0.7094 - val_loss: 0.6001
 Epoch 426/500
 10/10 0s 8ms/step -
 accuracy: 0.6973 - loss: 0.6103 - val_accuracy: 0.7094 - val_loss: 0.6001
 Epoch 427/500
 10/10 0s 7ms/step -
 accuracy: 0.7045 - loss: 0.6030 - val_accuracy: 0.7094 - val_loss: 0.6000
 Epoch 428/500
 10/10 0s 7ms/step -
 accuracy: 0.7256 - loss: 0.5851 - val_accuracy: 0.7094 - val_loss: 0.6000
 Epoch 429/500
 10/10 0s 7ms/step -
 accuracy: 0.7056 - loss: 0.6026 - val_accuracy: 0.7094 - val_loss: 0.6000
 Epoch 430/500
 10/10 0s 12ms/step -
 accuracy: 0.7372 - loss: 0.5743 - val_accuracy: 0.7094 - val_loss: 0.6000
 Epoch 431/500
 10/10 0s 7ms/step -
 accuracy: 0.7283 - loss: 0.5820 - val_accuracy: 0.7094 - val_loss: 0.6000
 Epoch 432/500
 10/10 0s 8ms/step -
 accuracy: 0.7323 - loss: 0.5781 - val_accuracy: 0.7094 - val_loss: 0.6000
 Epoch 433/500
 10/10 0s 8ms/step -
 accuracy: 0.7057 - loss: 0.6024 - val_accuracy: 0.7094 - val_loss: 0.6000
 Epoch 434/500
 10/10 0s 8ms/step -
 accuracy: 0.7248 - loss: 0.5851 - val_accuracy: 0.7094 - val_loss: 0.6000
 Epoch 435/500
 10/10 0s 8ms/step -
 accuracy: 0.7284 - loss: 0.5813 - val_accuracy: 0.7094 - val_loss: 0.6000
 Epoch 436/500
 10/10 0s 8ms/step -
 accuracy: 0.7053 - loss: 0.6033 - val_accuracy: 0.7094 - val_loss: 0.6000
 Epoch 437/500
 10/10 0s 9ms/step -
 accuracy: 0.7221 - loss: 0.5881 - val_accuracy: 0.7094 - val_loss: 0.6000
 Epoch 438/500
 10/10 0s 8ms/step -

accuracy: 0.7127 - loss: 0.5953 - val_accuracy: 0.7094 - val_loss: 0.5999
 Epoch 439/500
 10/10 0s 7ms/step -
 accuracy: 0.7088 - loss: 0.5997 - val_accuracy: 0.7094 - val_loss: 0.5999
 Epoch 440/500
 10/10 0s 8ms/step -
 accuracy: 0.7187 - loss: 0.5911 - val_accuracy: 0.7094 - val_loss: 0.5999
 Epoch 441/500
 10/10 0s 7ms/step -
 accuracy: 0.7030 - loss: 0.6050 - val_accuracy: 0.7094 - val_loss: 0.5999
 Epoch 442/500
 10/10 0s 7ms/step -
 accuracy: 0.7365 - loss: 0.5753 - val_accuracy: 0.7094 - val_loss: 0.5999
 Epoch 443/500
 10/10 0s 7ms/step -
 accuracy: 0.6960 - loss: 0.6112 - val_accuracy: 0.7094 - val_loss: 0.5999
 Epoch 444/500
 10/10 0s 7ms/step -
 accuracy: 0.7123 - loss: 0.5961 - val_accuracy: 0.7094 - val_loss: 0.5999
 Epoch 445/500
 10/10 0s 7ms/step -
 accuracy: 0.7368 - loss: 0.5748 - val_accuracy: 0.7094 - val_loss: 0.5999
 Epoch 446/500
 10/10 0s 8ms/step -
 accuracy: 0.7171 - loss: 0.5921 - val_accuracy: 0.7094 - val_loss: 0.5999
 Epoch 447/500
 10/10 0s 15ms/step -
 accuracy: 0.7152 - loss: 0.5937 - val_accuracy: 0.7094 - val_loss: 0.5999
 Epoch 448/500
 10/10 0s 8ms/step -
 accuracy: 0.7145 - loss: 0.5953 - val_accuracy: 0.7094 - val_loss: 0.5999
 Epoch 449/500
 10/10 0s 9ms/step -
 accuracy: 0.7080 - loss: 0.6011 - val_accuracy: 0.7094 - val_loss: 0.5999
 Epoch 450/500
 10/10 0s 7ms/step -
 accuracy: 0.7155 - loss: 0.5933 - val_accuracy: 0.7094 - val_loss: 0.5999
 Epoch 451/500
 10/10 0s 7ms/step -
 accuracy: 0.7050 - loss: 0.6021 - val_accuracy: 0.7094 - val_loss: 0.5998
 Epoch 452/500
 10/10 0s 9ms/step -
 accuracy: 0.7059 - loss: 0.6022 - val_accuracy: 0.7094 - val_loss: 0.5998
 Epoch 453/500
 10/10 0s 8ms/step -
 accuracy: 0.7101 - loss: 0.5984 - val_accuracy: 0.7094 - val_loss: 0.5998
 Epoch 454/500
 10/10 0s 8ms/step -

accuracy: 0.6973 - loss: 0.6097 - val_accuracy: 0.7094 - val_loss: 0.5998
 Epoch 455/500
 10/10 0s 8ms/step -
 accuracy: 0.7135 - loss: 0.5950 - val_accuracy: 0.7094 - val_loss: 0.5998
 Epoch 456/500
 10/10 0s 10ms/step -
 accuracy: 0.7062 - loss: 0.6026 - val_accuracy: 0.7094 - val_loss: 0.5998
 Epoch 457/500
 10/10 0s 13ms/step -
 accuracy: 0.7060 - loss: 0.6021 - val_accuracy: 0.7094 - val_loss: 0.5998
 Epoch 458/500
 10/10 0s 9ms/step -
 accuracy: 0.7113 - loss: 0.5975 - val_accuracy: 0.7094 - val_loss: 0.5998
 Epoch 459/500
 10/10 0s 10ms/step -
 accuracy: 0.7052 - loss: 0.6028 - val_accuracy: 0.7094 - val_loss: 0.5998
 Epoch 460/500
 10/10 0s 8ms/step -
 accuracy: 0.7222 - loss: 0.5877 - val_accuracy: 0.7094 - val_loss: 0.5998
 Epoch 461/500
 10/10 0s 8ms/step -
 accuracy: 0.7154 - loss: 0.5938 - val_accuracy: 0.7094 - val_loss: 0.5998
 Epoch 462/500
 10/10 0s 8ms/step -
 accuracy: 0.7229 - loss: 0.5867 - val_accuracy: 0.7094 - val_loss: 0.5998
 Epoch 463/500
 10/10 0s 7ms/step -
 accuracy: 0.7306 - loss: 0.5797 - val_accuracy: 0.7094 - val_loss: 0.5998
 Epoch 464/500
 10/10 0s 8ms/step -
 accuracy: 0.7405 - loss: 0.5701 - val_accuracy: 0.7094 - val_loss: 0.5998
 Epoch 465/500
 10/10 0s 8ms/step -
 accuracy: 0.7002 - loss: 0.6062 - val_accuracy: 0.7094 - val_loss: 0.5998
 Epoch 466/500
 10/10 0s 8ms/step -
 accuracy: 0.7189 - loss: 0.5898 - val_accuracy: 0.7094 - val_loss: 0.5997
 Epoch 467/500
 10/10 0s 8ms/step -
 accuracy: 0.7355 - loss: 0.5755 - val_accuracy: 0.7094 - val_loss: 0.5997
 Epoch 468/500
 10/10 0s 8ms/step -
 accuracy: 0.7264 - loss: 0.5835 - val_accuracy: 0.7094 - val_loss: 0.5997
 Epoch 469/500
 10/10 0s 9ms/step -
 accuracy: 0.6944 - loss: 0.6130 - val_accuracy: 0.7094 - val_loss: 0.5997
 Epoch 470/500
 10/10 0s 9ms/step -

accuracy: 0.7033 - loss: 0.6048 - val_accuracy: 0.7094 - val_loss: 0.5997
 Epoch 471/500
 10/10 0s 9ms/step -
 accuracy: 0.7255 - loss: 0.5849 - val_accuracy: 0.7094 - val_loss: 0.5997
 Epoch 472/500
 10/10 0s 8ms/step -
 accuracy: 0.7203 - loss: 0.5886 - val_accuracy: 0.7094 - val_loss: 0.5997
 Epoch 473/500
 10/10 0s 7ms/step -
 accuracy: 0.7187 - loss: 0.5901 - val_accuracy: 0.7094 - val_loss: 0.5997
 Epoch 474/500
 10/10 0s 8ms/step -
 accuracy: 0.7038 - loss: 0.6040 - val_accuracy: 0.7094 - val_loss: 0.5997
 Epoch 475/500
 10/10 0s 9ms/step -
 accuracy: 0.7241 - loss: 0.5861 - val_accuracy: 0.7094 - val_loss: 0.5997
 Epoch 476/500
 10/10 0s 8ms/step -
 accuracy: 0.7149 - loss: 0.5929 - val_accuracy: 0.7094 - val_loss: 0.5997
 Epoch 477/500
 10/10 0s 8ms/step -
 accuracy: 0.7248 - loss: 0.5844 - val_accuracy: 0.7094 - val_loss: 0.5996
 Epoch 478/500
 10/10 0s 8ms/step -
 accuracy: 0.7043 - loss: 0.6037 - val_accuracy: 0.7094 - val_loss: 0.5996
 Epoch 479/500
 10/10 0s 7ms/step -
 accuracy: 0.7304 - loss: 0.5797 - val_accuracy: 0.7094 - val_loss: 0.5996
 Epoch 480/500
 10/10 0s 10ms/step -
 accuracy: 0.7134 - loss: 0.5963 - val_accuracy: 0.7094 - val_loss: 0.5996
 Epoch 481/500
 10/10 0s 8ms/step -
 accuracy: 0.7108 - loss: 0.5984 - val_accuracy: 0.7094 - val_loss: 0.5996
 Epoch 482/500
 10/10 0s 8ms/step -
 accuracy: 0.6997 - loss: 0.6079 - val_accuracy: 0.7094 - val_loss: 0.5996
 Epoch 483/500
 10/10 0s 7ms/step -
 accuracy: 0.6987 - loss: 0.6080 - val_accuracy: 0.7094 - val_loss: 0.5996
 Epoch 484/500
 10/10 0s 13ms/step -
 accuracy: 0.7307 - loss: 0.5793 - val_accuracy: 0.7094 - val_loss: 0.5996
 Epoch 485/500
 10/10 0s 12ms/step -
 accuracy: 0.7202 - loss: 0.5887 - val_accuracy: 0.7094 - val_loss: 0.5996
 Epoch 486/500
 10/10 0s 10ms/step -

```

accuracy: 0.7219 - loss: 0.5865 - val_accuracy: 0.7094 - val_loss: 0.5996
Epoch 487/500
10/10          0s 9ms/step -
accuracy: 0.7103 - loss: 0.5978 - val_accuracy: 0.7094 - val_loss: 0.5996
Epoch 488/500
10/10          0s 10ms/step -
accuracy: 0.7140 - loss: 0.5944 - val_accuracy: 0.7094 - val_loss: 0.5996
Epoch 489/500
10/10          0s 8ms/step -
accuracy: 0.7183 - loss: 0.5911 - val_accuracy: 0.7094 - val_loss: 0.5996
Epoch 490/500
10/10          0s 8ms/step -
accuracy: 0.6879 - loss: 0.6182 - val_accuracy: 0.7094 - val_loss: 0.5996
Epoch 491/500
10/10          0s 8ms/step -
accuracy: 0.7266 - loss: 0.5831 - val_accuracy: 0.7094 - val_loss: 0.5996
Epoch 492/500
10/10          0s 12ms/step -
accuracy: 0.7324 - loss: 0.5782 - val_accuracy: 0.7094 - val_loss: 0.5996
Epoch 493/500
10/10          0s 13ms/step -
accuracy: 0.6836 - loss: 0.6214 - val_accuracy: 0.7094 - val_loss: 0.5995
Epoch 494/500
10/10          0s 11ms/step -
accuracy: 0.7095 - loss: 0.5991 - val_accuracy: 0.7094 - val_loss: 0.5995
Epoch 495/500
10/10          0s 9ms/step -
accuracy: 0.7479 - loss: 0.5639 - val_accuracy: 0.7094 - val_loss: 0.5995
Epoch 496/500
10/10          0s 9ms/step -
accuracy: 0.7058 - loss: 0.6021 - val_accuracy: 0.7094 - val_loss: 0.5995
Epoch 497/500
10/10          0s 10ms/step -
accuracy: 0.7062 - loss: 0.6031 - val_accuracy: 0.7094 - val_loss: 0.5995
Epoch 498/500
10/10          0s 18ms/step -
accuracy: 0.7200 - loss: 0.5886 - val_accuracy: 0.7094 - val_loss: 0.5995
Epoch 499/500
10/10          0s 20ms/step -
accuracy: 0.7077 - loss: 0.6011 - val_accuracy: 0.7094 - val_loss: 0.5995
Epoch 500/500
10/10          0s 11ms/step -
accuracy: 0.7111 - loss: 0.5972 - val_accuracy: 0.7094 - val_loss: 0.5995

```

```

[48]: final_val_accuracy = history.history['val_accuracy'][-1]
      print(f"Final Validation Accuracy: {final_val_accuracy * 100:.2f}%")

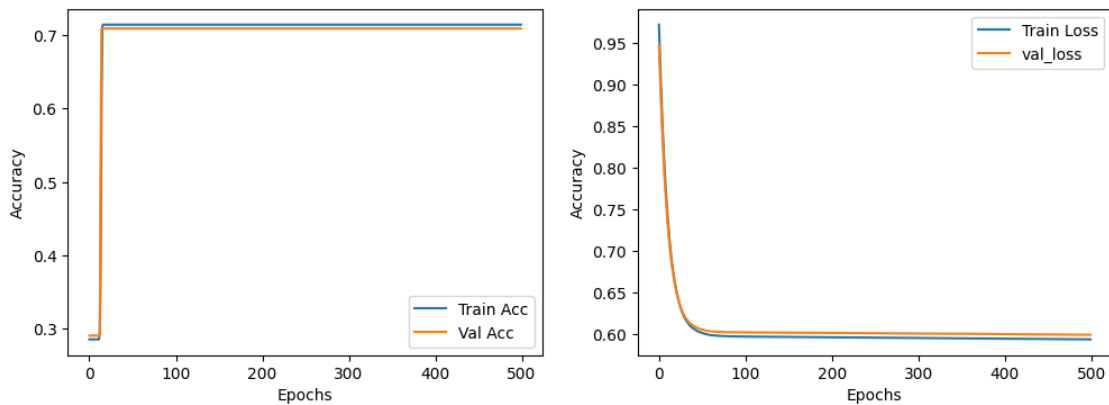
```

```

Final Validation Accuracy: 70.94%

```

```
[49]: plt.figure(figsize=(12,4))
plt.subplot(1,2,1)
plt.plot(history.history['accuracy'], label='Train Acc')
plt.plot(history.history['val_accuracy'], label='Val Acc')
plt.xlabel('Epochs')
plt.ylabel('Accuracy')
plt.legend()
plt.subplot(1,2,2)
plt.plot(history.history['loss'], label='Train Loss')
plt.plot(history.history['val_loss'], label = 'val_loss')
plt.xlabel('Epochs')
plt.ylabel('Accuracy')
plt.legend()
plt.show()
```



0.6 Question:5 There are many activation function we can use in our process of creating models. Apart from the sigmoid activation function one can also use activation function like relu (which is defined as $\text{relu}(z) = \max(0, z)$) in the intermediate layer neurons. Try to create a model which gives a better accuracy than the above ones you had by altering the architecture and activation functions. You can also try to change the batch size in your training process.

0.6.1 Using ReLU activation, batch_size = 25 and 1000 epochs

```
[51]: model = Sequential()
model.add(Dense(10, activation = 'relu', input_shape = (9,)))
model.add(Dense(1, activation = 'sigmoid'))
model.summary()
model.compile(loss = "BinaryCrossentropy", optimizer = "SGD", metrics = [
    "accuracy"])
```

```
history = model.fit(x_train,y_train, batch_size=25, epochs = 1000, verbose=1,
↪validation_data=(x_test,y_test))
```

Model: "sequential_4"

Layer (type)	Output Shape	Param #
dense_6 (Dense)	(None, 10)	100
dense_7 (Dense)	(None, 1)	11

Total params: 111 (444.00 B)

Trainable params: 111 (444.00 B)

Non-trainable params: 0 (0.00 B)

Epoch 1/1000

19/19 1s 15ms/step - accuracy: 0.7318 - loss: 0.6115 - val_accuracy: 0.7094 - val_loss: 0.6148

Epoch 2/1000

19/19 0s 6ms/step - accuracy: 0.6833 - loss: 0.6267 - val_accuracy: 0.7094 - val_loss: 0.6084

Epoch 3/1000

19/19 0s 5ms/step - accuracy: 0.7208 - loss: 0.6025 - val_accuracy: 0.7094 - val_loss: 0.6041

Epoch 4/1000

19/19 0s 7ms/step - accuracy: 0.7183 - loss: 0.5968 - val_accuracy: 0.7094 - val_loss: 0.6009

Epoch 5/1000

19/19 0s 5ms/step - accuracy: 0.6863 - loss: 0.6147 - val_accuracy: 0.7094 - val_loss: 0.5984

Epoch 6/1000

19/19 0s 6ms/step - accuracy: 0.7183 - loss: 0.5940 - val_accuracy: 0.7094 - val_loss: 0.5966

Epoch 7/1000

19/19 0s 5ms/step - accuracy: 0.7119 - loss: 0.5961 - val_accuracy: 0.7094 - val_loss: 0.5953

Epoch 8/1000

19/19 0s 5ms/step - accuracy: 0.7267 - loss: 0.5872 - val_accuracy: 0.7094 - val_loss: 0.5942

Epoch 9/1000

19/19 0s 6ms/step -

accuracy: 0.6953 - loss: 0.6019 - val_accuracy: 0.7094 - val_loss: 0.5933
 Epoch 10/1000
 19/19 0s 5ms/step -
 accuracy: 0.7056 - loss: 0.5924 - val_accuracy: 0.7094 - val_loss: 0.5926
 Epoch 11/1000
 19/19 0s 5ms/step -
 accuracy: 0.7188 - loss: 0.5877 - val_accuracy: 0.7094 - val_loss: 0.5921
 Epoch 12/1000
 19/19 0s 5ms/step -
 accuracy: 0.7586 - loss: 0.5503 - val_accuracy: 0.7094 - val_loss: 0.5916
 Epoch 13/1000
 19/19 0s 6ms/step -
 accuracy: 0.7350 - loss: 0.5693 - val_accuracy: 0.7094 - val_loss: 0.5911
 Epoch 14/1000
 19/19 0s 7ms/step -
 accuracy: 0.7108 - loss: 0.5888 - val_accuracy: 0.7094 - val_loss: 0.5907
 Epoch 15/1000
 19/19 0s 5ms/step -
 accuracy: 0.6996 - loss: 0.5970 - val_accuracy: 0.7094 - val_loss: 0.5903
 Epoch 16/1000
 19/19 0s 5ms/step -
 accuracy: 0.6983 - loss: 0.5947 - val_accuracy: 0.7094 - val_loss: 0.5899
 Epoch 17/1000
 19/19 0s 5ms/step -
 accuracy: 0.7018 - loss: 0.5960 - val_accuracy: 0.7094 - val_loss: 0.5896
 Epoch 18/1000
 19/19 0s 5ms/step -
 accuracy: 0.7054 - loss: 0.5925 - val_accuracy: 0.7094 - val_loss: 0.5893
 Epoch 19/1000
 19/19 0s 5ms/step -
 accuracy: 0.7479 - loss: 0.5566 - val_accuracy: 0.7094 - val_loss: 0.5889
 Epoch 20/1000
 19/19 0s 5ms/step -
 accuracy: 0.7079 - loss: 0.5907 - val_accuracy: 0.7094 - val_loss: 0.5886
 Epoch 21/1000
 19/19 0s 5ms/step -
 accuracy: 0.7384 - loss: 0.5654 - val_accuracy: 0.7094 - val_loss: 0.5883
 Epoch 22/1000
 19/19 0s 6ms/step -
 accuracy: 0.7125 - loss: 0.5826 - val_accuracy: 0.7094 - val_loss: 0.5880
 Epoch 23/1000
 19/19 0s 5ms/step -
 accuracy: 0.7114 - loss: 0.5860 - val_accuracy: 0.7094 - val_loss: 0.5877
 Epoch 24/1000
 19/19 0s 5ms/step -
 accuracy: 0.6807 - loss: 0.6130 - val_accuracy: 0.7094 - val_loss: 0.5874
 Epoch 25/1000
 19/19 0s 4ms/step -

accuracy: 0.6850 - loss: 0.6102 - val_accuracy: 0.7094 - val_loss: 0.5871
 Epoch 26/1000
 19/19 0s 4ms/step -
 accuracy: 0.7087 - loss: 0.5873 - val_accuracy: 0.7094 - val_loss: 0.5868
 Epoch 27/1000
 19/19 0s 5ms/step -
 accuracy: 0.7217 - loss: 0.5788 - val_accuracy: 0.7094 - val_loss: 0.5865
 Epoch 28/1000
 19/19 0s 5ms/step -
 accuracy: 0.7168 - loss: 0.5767 - val_accuracy: 0.7094 - val_loss: 0.5862
 Epoch 29/1000
 19/19 0s 5ms/step -
 accuracy: 0.7262 - loss: 0.5720 - val_accuracy: 0.7094 - val_loss: 0.5859
 Epoch 30/1000
 19/19 0s 5ms/step -
 accuracy: 0.7044 - loss: 0.5870 - val_accuracy: 0.7094 - val_loss: 0.5856
 Epoch 31/1000
 19/19 0s 5ms/step -
 accuracy: 0.7004 - loss: 0.5948 - val_accuracy: 0.7094 - val_loss: 0.5853
 Epoch 32/1000
 19/19 0s 5ms/step -
 accuracy: 0.6965 - loss: 0.5915 - val_accuracy: 0.7094 - val_loss: 0.5851
 Epoch 33/1000
 19/19 0s 5ms/step -
 accuracy: 0.7180 - loss: 0.5763 - val_accuracy: 0.7094 - val_loss: 0.5848
 Epoch 34/1000
 19/19 0s 5ms/step -
 accuracy: 0.7223 - loss: 0.5713 - val_accuracy: 0.7094 - val_loss: 0.5845
 Epoch 35/1000
 19/19 0s 5ms/step -
 accuracy: 0.7083 - loss: 0.5805 - val_accuracy: 0.7094 - val_loss: 0.5842
 Epoch 36/1000
 19/19 0s 5ms/step -
 accuracy: 0.7367 - loss: 0.5602 - val_accuracy: 0.7094 - val_loss: 0.5839
 Epoch 37/1000
 19/19 0s 4ms/step -
 accuracy: 0.6712 - loss: 0.6147 - val_accuracy: 0.7094 - val_loss: 0.5836
 Epoch 38/1000
 19/19 0s 5ms/step -
 accuracy: 0.7096 - loss: 0.5838 - val_accuracy: 0.7094 - val_loss: 0.5833
 Epoch 39/1000
 19/19 0s 5ms/step -
 accuracy: 0.7001 - loss: 0.5892 - val_accuracy: 0.7094 - val_loss: 0.5830
 Epoch 40/1000
 19/19 0s 5ms/step -
 accuracy: 0.7101 - loss: 0.5827 - val_accuracy: 0.7094 - val_loss: 0.5827
 Epoch 41/1000
 19/19 0s 5ms/step -

```

accuracy: 0.6824 - loss: 0.6069 - val_accuracy: 0.7094 - val_loss: 0.5825
Epoch 42/1000
19/19          0s 5ms/step -
accuracy: 0.7169 - loss: 0.5737 - val_accuracy: 0.7094 - val_loss: 0.5822
Epoch 43/1000
19/19          0s 4ms/step -
accuracy: 0.7043 - loss: 0.5919 - val_accuracy: 0.7094 - val_loss: 0.5819
Epoch 44/1000
19/19          0s 5ms/step -
accuracy: 0.7250 - loss: 0.5727 - val_accuracy: 0.7094 - val_loss: 0.5816
Epoch 45/1000
19/19          0s 4ms/step -
accuracy: 0.7419 - loss: 0.5566 - val_accuracy: 0.7094 - val_loss: 0.5814
Epoch 46/1000
19/19          0s 5ms/step -
accuracy: 0.7286 - loss: 0.5650 - val_accuracy: 0.7094 - val_loss: 0.5811
Epoch 47/1000
19/19          0s 5ms/step -
accuracy: 0.7334 - loss: 0.5613 - val_accuracy: 0.7094 - val_loss: 0.5808
Epoch 48/1000
19/19          0s 5ms/step -
accuracy: 0.7079 - loss: 0.5782 - val_accuracy: 0.7094 - val_loss: 0.5805
Epoch 49/1000
19/19          0s 4ms/step -
accuracy: 0.6943 - loss: 0.5919 - val_accuracy: 0.7094 - val_loss: 0.5803
Epoch 50/1000
19/19          0s 5ms/step -
accuracy: 0.7335 - loss: 0.5591 - val_accuracy: 0.7094 - val_loss: 0.5800
Epoch 51/1000
19/19          0s 5ms/step -
accuracy: 0.7143 - loss: 0.5718 - val_accuracy: 0.7094 - val_loss: 0.5797
Epoch 52/1000
19/19          0s 4ms/step -
accuracy: 0.7341 - loss: 0.5597 - val_accuracy: 0.7094 - val_loss: 0.5795
Epoch 53/1000
19/19          0s 5ms/step -
accuracy: 0.7310 - loss: 0.5593 - val_accuracy: 0.7094 - val_loss: 0.5792
Epoch 54/1000
19/19          0s 5ms/step -
accuracy: 0.7012 - loss: 0.5873 - val_accuracy: 0.7094 - val_loss: 0.5789
Epoch 55/1000
19/19          0s 5ms/step -
accuracy: 0.7150 - loss: 0.5742 - val_accuracy: 0.7094 - val_loss: 0.5786
Epoch 56/1000
19/19          0s 5ms/step -
accuracy: 0.6745 - loss: 0.6111 - val_accuracy: 0.7094 - val_loss: 0.5784
Epoch 57/1000
19/19          0s 7ms/step -

```


accuracy: 0.7200 - loss: 0.5694 - val_accuracy: 0.7094 - val_loss: 0.5781
 Epoch 58/1000
 19/19 0s 5ms/step -
 accuracy: 0.6975 - loss: 0.5857 - val_accuracy: 0.7094 - val_loss: 0.5778
 Epoch 59/1000
 19/19 0s 5ms/step -
 accuracy: 0.7296 - loss: 0.5627 - val_accuracy: 0.7094 - val_loss: 0.5776
 Epoch 60/1000
 19/19 0s 5ms/step -
 accuracy: 0.7062 - loss: 0.5765 - val_accuracy: 0.7094 - val_loss: 0.5773
 Epoch 61/1000
 19/19 0s 6ms/step -
 accuracy: 0.6779 - loss: 0.6027 - val_accuracy: 0.7094 - val_loss: 0.5771
 Epoch 62/1000
 19/19 0s 5ms/step -
 accuracy: 0.7248 - loss: 0.5626 - val_accuracy: 0.7094 - val_loss: 0.5768
 Epoch 63/1000
 19/19 0s 5ms/step -
 accuracy: 0.7037 - loss: 0.5832 - val_accuracy: 0.7094 - val_loss: 0.5766
 Epoch 64/1000
 19/19 0s 5ms/step -
 accuracy: 0.7279 - loss: 0.5566 - val_accuracy: 0.7094 - val_loss: 0.5763
 Epoch 65/1000
 19/19 0s 5ms/step -
 accuracy: 0.6784 - loss: 0.5997 - val_accuracy: 0.7094 - val_loss: 0.5761
 Epoch 66/1000
 19/19 0s 5ms/step -
 accuracy: 0.7188 - loss: 0.5663 - val_accuracy: 0.7094 - val_loss: 0.5758
 Epoch 67/1000
 19/19 0s 5ms/step -
 accuracy: 0.6767 - loss: 0.6000 - val_accuracy: 0.7094 - val_loss: 0.5756
 Epoch 68/1000
 19/19 0s 5ms/step -
 accuracy: 0.7138 - loss: 0.5693 - val_accuracy: 0.7094 - val_loss: 0.5753
 Epoch 69/1000
 19/19 0s 4ms/step -
 accuracy: 0.7165 - loss: 0.5692 - val_accuracy: 0.7094 - val_loss: 0.5751
 Epoch 70/1000
 19/19 0s 5ms/step -
 accuracy: 0.7045 - loss: 0.5716 - val_accuracy: 0.7094 - val_loss: 0.5748
 Epoch 71/1000
 19/19 0s 4ms/step -
 accuracy: 0.7203 - loss: 0.5634 - val_accuracy: 0.7094 - val_loss: 0.5746
 Epoch 72/1000
 19/19 0s 5ms/step -
 accuracy: 0.7108 - loss: 0.5718 - val_accuracy: 0.7094 - val_loss: 0.5743
 Epoch 73/1000
 19/19 0s 4ms/step -

```

accuracy: 0.7148 - loss: 0.5735 - val_accuracy: 0.7094 - val_loss: 0.5741
Epoch 74/1000
19/19          0s 5ms/step -
accuracy: 0.7383 - loss: 0.5472 - val_accuracy: 0.7094 - val_loss: 0.5739
Epoch 75/1000
19/19          0s 6ms/step -
accuracy: 0.7237 - loss: 0.5640 - val_accuracy: 0.7094 - val_loss: 0.5736
Epoch 76/1000
19/19          0s 5ms/step -
accuracy: 0.7237 - loss: 0.5629 - val_accuracy: 0.7094 - val_loss: 0.5734
Epoch 77/1000
19/19          0s 5ms/step -
accuracy: 0.6797 - loss: 0.5956 - val_accuracy: 0.7094 - val_loss: 0.5731
Epoch 78/1000
19/19          0s 4ms/step -
accuracy: 0.6715 - loss: 0.6063 - val_accuracy: 0.7094 - val_loss: 0.5729
Epoch 79/1000
19/19          0s 4ms/step -
accuracy: 0.7144 - loss: 0.5691 - val_accuracy: 0.7094 - val_loss: 0.5727
Epoch 80/1000
19/19          0s 4ms/step -
accuracy: 0.7267 - loss: 0.5545 - val_accuracy: 0.7094 - val_loss: 0.5725
Epoch 81/1000
19/19          0s 7ms/step -
accuracy: 0.6905 - loss: 0.5859 - val_accuracy: 0.7094 - val_loss: 0.5722
Epoch 82/1000
19/19          0s 4ms/step -
accuracy: 0.7390 - loss: 0.5439 - val_accuracy: 0.7094 - val_loss: 0.5719
Epoch 83/1000
19/19          0s 5ms/step -
accuracy: 0.6952 - loss: 0.5901 - val_accuracy: 0.7094 - val_loss: 0.5717
Epoch 84/1000
19/19          0s 4ms/step -
accuracy: 0.7187 - loss: 0.5569 - val_accuracy: 0.7094 - val_loss: 0.5715
Epoch 85/1000
19/19          0s 4ms/step -
accuracy: 0.6983 - loss: 0.5792 - val_accuracy: 0.7094 - val_loss: 0.5713
Epoch 86/1000
19/19          0s 4ms/step -
accuracy: 0.7186 - loss: 0.5617 - val_accuracy: 0.7094 - val_loss: 0.5710
Epoch 87/1000
19/19          0s 4ms/step -
accuracy: 0.7059 - loss: 0.5724 - val_accuracy: 0.7094 - val_loss: 0.5708
Epoch 88/1000
19/19          0s 4ms/step -
accuracy: 0.7245 - loss: 0.5537 - val_accuracy: 0.7094 - val_loss: 0.5706
Epoch 89/1000
19/19          0s 4ms/step -

```

```

accuracy: 0.7095 - loss: 0.5735 - val_accuracy: 0.7094 - val_loss: 0.5704
Epoch 90/1000
19/19          0s 5ms/step -
accuracy: 0.7147 - loss: 0.5567 - val_accuracy: 0.7094 - val_loss: 0.5701
Epoch 91/1000
19/19          0s 5ms/step -
accuracy: 0.7147 - loss: 0.5608 - val_accuracy: 0.7094 - val_loss: 0.5699
Epoch 92/1000
19/19          0s 5ms/step -
accuracy: 0.7264 - loss: 0.5530 - val_accuracy: 0.7094 - val_loss: 0.5696
Epoch 93/1000
19/19          0s 5ms/step -
accuracy: 0.7540 - loss: 0.5331 - val_accuracy: 0.7094 - val_loss: 0.5694
Epoch 94/1000
19/19          0s 5ms/step -
accuracy: 0.7543 - loss: 0.5316 - val_accuracy: 0.7094 - val_loss: 0.5692
Epoch 95/1000
19/19          0s 4ms/step -
accuracy: 0.6829 - loss: 0.5907 - val_accuracy: 0.7094 - val_loss: 0.5690
Epoch 96/1000
19/19          0s 5ms/step -
accuracy: 0.7192 - loss: 0.5588 - val_accuracy: 0.7094 - val_loss: 0.5688
Epoch 97/1000
19/19          0s 4ms/step -
accuracy: 0.7224 - loss: 0.5615 - val_accuracy: 0.7094 - val_loss: 0.5685
Epoch 98/1000
19/19          0s 5ms/step -
accuracy: 0.7095 - loss: 0.5743 - val_accuracy: 0.7094 - val_loss: 0.5684
Epoch 99/1000
19/19          0s 7ms/step -
accuracy: 0.7451 - loss: 0.5387 - val_accuracy: 0.7094 - val_loss: 0.5681
Epoch 100/1000
19/19          0s 4ms/step -
accuracy: 0.7254 - loss: 0.5597 - val_accuracy: 0.7094 - val_loss: 0.5679
Epoch 101/1000
19/19          0s 4ms/step -
accuracy: 0.7008 - loss: 0.5730 - val_accuracy: 0.7094 - val_loss: 0.5677
Epoch 102/1000
19/19          0s 5ms/step -
accuracy: 0.7178 - loss: 0.5555 - val_accuracy: 0.7094 - val_loss: 0.5675
Epoch 103/1000
19/19          0s 5ms/step -
accuracy: 0.7388 - loss: 0.5404 - val_accuracy: 0.7094 - val_loss: 0.5673
Epoch 104/1000
19/19          0s 4ms/step -
accuracy: 0.6932 - loss: 0.5769 - val_accuracy: 0.7094 - val_loss: 0.5671
Epoch 105/1000
19/19          0s 4ms/step -

```

```

accuracy: 0.7112 - loss: 0.5615 - val_accuracy: 0.7094 - val_loss: 0.5669
Epoch 106/1000
19/19          0s 7ms/step -
accuracy: 0.7083 - loss: 0.5657 - val_accuracy: 0.7094 - val_loss: 0.5667
Epoch 107/1000
19/19          0s 5ms/step -
accuracy: 0.7047 - loss: 0.5706 - val_accuracy: 0.7094 - val_loss: 0.5664
Epoch 108/1000
19/19          0s 5ms/step -
accuracy: 0.6907 - loss: 0.5828 - val_accuracy: 0.7094 - val_loss: 0.5662
Epoch 109/1000
19/19          0s 5ms/step -
accuracy: 0.7000 - loss: 0.5824 - val_accuracy: 0.7094 - val_loss: 0.5660
Epoch 110/1000
19/19          0s 5ms/step -
accuracy: 0.6855 - loss: 0.5948 - val_accuracy: 0.7094 - val_loss: 0.5658
Epoch 111/1000
19/19          0s 5ms/step -
accuracy: 0.7248 - loss: 0.5481 - val_accuracy: 0.7094 - val_loss: 0.5656
Epoch 112/1000
19/19          0s 5ms/step -
accuracy: 0.7349 - loss: 0.5350 - val_accuracy: 0.7094 - val_loss: 0.5654
Epoch 113/1000
19/19          0s 5ms/step -
accuracy: 0.7167 - loss: 0.5591 - val_accuracy: 0.7094 - val_loss: 0.5652
Epoch 114/1000
19/19          0s 7ms/step -
accuracy: 0.6924 - loss: 0.5809 - val_accuracy: 0.7094 - val_loss: 0.5650
Epoch 115/1000
19/19          0s 4ms/step -
accuracy: 0.7222 - loss: 0.5428 - val_accuracy: 0.7094 - val_loss: 0.5648
Epoch 116/1000
19/19          0s 5ms/step -
accuracy: 0.7027 - loss: 0.5784 - val_accuracy: 0.7094 - val_loss: 0.5646
Epoch 117/1000
19/19          0s 4ms/step -
accuracy: 0.7075 - loss: 0.5593 - val_accuracy: 0.7094 - val_loss: 0.5645
Epoch 118/1000
19/19          0s 5ms/step -
accuracy: 0.7205 - loss: 0.5534 - val_accuracy: 0.7094 - val_loss: 0.5643
Epoch 119/1000
19/19          0s 4ms/step -
accuracy: 0.7237 - loss: 0.5460 - val_accuracy: 0.7094 - val_loss: 0.5641
Epoch 120/1000
19/19          0s 4ms/step -
accuracy: 0.6802 - loss: 0.5881 - val_accuracy: 0.7094 - val_loss: 0.5639
Epoch 121/1000
19/19          0s 5ms/step -

```

accuracy: 0.6921 - loss: 0.5713 - val_accuracy: 0.7094 - val_loss: 0.5637
 Epoch 122/1000
 19/19 0s 5ms/step -
 accuracy: 0.7257 - loss: 0.5520 - val_accuracy: 0.7094 - val_loss: 0.5635
 Epoch 123/1000
 19/19 0s 5ms/step -
 accuracy: 0.7305 - loss: 0.5375 - val_accuracy: 0.7094 - val_loss: 0.5633
 Epoch 124/1000
 19/19 0s 5ms/step -
 accuracy: 0.7161 - loss: 0.5594 - val_accuracy: 0.7094 - val_loss: 0.5631
 Epoch 125/1000
 19/19 0s 5ms/step -
 accuracy: 0.7011 - loss: 0.5655 - val_accuracy: 0.7094 - val_loss: 0.5629
 Epoch 126/1000
 19/19 0s 5ms/step -
 accuracy: 0.7501 - loss: 0.5321 - val_accuracy: 0.7094 - val_loss: 0.5626
 Epoch 127/1000
 19/19 0s 11ms/step -
 accuracy: 0.7217 - loss: 0.5505 - val_accuracy: 0.7094 - val_loss: 0.5625
 Epoch 128/1000
 19/19 0s 4ms/step -
 accuracy: 0.7192 - loss: 0.5589 - val_accuracy: 0.7094 - val_loss: 0.5623
 Epoch 129/1000
 19/19 0s 5ms/step -
 accuracy: 0.7075 - loss: 0.5570 - val_accuracy: 0.7094 - val_loss: 0.5621
 Epoch 130/1000
 19/19 0s 5ms/step -
 accuracy: 0.7275 - loss: 0.5454 - val_accuracy: 0.7094 - val_loss: 0.5619
 Epoch 131/1000
 19/19 0s 5ms/step -
 accuracy: 0.7225 - loss: 0.5555 - val_accuracy: 0.7094 - val_loss: 0.5617
 Epoch 132/1000
 19/19 0s 5ms/step -
 accuracy: 0.7130 - loss: 0.5599 - val_accuracy: 0.7094 - val_loss: 0.5616
 Epoch 133/1000
 19/19 0s 4ms/step -
 accuracy: 0.7291 - loss: 0.5414 - val_accuracy: 0.7094 - val_loss: 0.5614
 Epoch 134/1000
 19/19 0s 5ms/step -
 accuracy: 0.7074 - loss: 0.5658 - val_accuracy: 0.7094 - val_loss: 0.5612
 Epoch 135/1000
 19/19 0s 4ms/step -
 accuracy: 0.7093 - loss: 0.5572 - val_accuracy: 0.7094 - val_loss: 0.5610
 Epoch 136/1000
 19/19 0s 5ms/step -
 accuracy: 0.7476 - loss: 0.5317 - val_accuracy: 0.7094 - val_loss: 0.5608
 Epoch 137/1000
 19/19 0s 5ms/step -

```

accuracy: 0.7285 - loss: 0.5384 - val_accuracy: 0.7094 - val_loss: 0.5606
Epoch 138/1000
19/19          0s 5ms/step -
accuracy: 0.7337 - loss: 0.5375 - val_accuracy: 0.7094 - val_loss: 0.5605
Epoch 139/1000
19/19          0s 6ms/step -
accuracy: 0.7228 - loss: 0.5404 - val_accuracy: 0.7094 - val_loss: 0.5603
Epoch 140/1000
19/19          0s 9ms/step -
accuracy: 0.7047 - loss: 0.5531 - val_accuracy: 0.7094 - val_loss: 0.5601
Epoch 141/1000
19/19          0s 4ms/step -
accuracy: 0.7536 - loss: 0.5217 - val_accuracy: 0.7094 - val_loss: 0.5599
Epoch 142/1000
19/19          0s 5ms/step -
accuracy: 0.7107 - loss: 0.5599 - val_accuracy: 0.7094 - val_loss: 0.5597
Epoch 143/1000
19/19          0s 5ms/step -
accuracy: 0.7148 - loss: 0.5546 - val_accuracy: 0.7094 - val_loss: 0.5595
Epoch 144/1000
19/19          0s 5ms/step -
accuracy: 0.6892 - loss: 0.5716 - val_accuracy: 0.7094 - val_loss: 0.5594
Epoch 145/1000
19/19          0s 5ms/step -
accuracy: 0.7222 - loss: 0.5469 - val_accuracy: 0.7094 - val_loss: 0.5592
Epoch 146/1000
19/19          0s 5ms/step -
accuracy: 0.7184 - loss: 0.5456 - val_accuracy: 0.7094 - val_loss: 0.5591
Epoch 147/1000
19/19          0s 5ms/step -
accuracy: 0.7439 - loss: 0.5345 - val_accuracy: 0.7094 - val_loss: 0.5589
Epoch 148/1000
19/19          0s 5ms/step -
accuracy: 0.7220 - loss: 0.5448 - val_accuracy: 0.7094 - val_loss: 0.5588
Epoch 149/1000
19/19          0s 5ms/step -
accuracy: 0.7372 - loss: 0.5374 - val_accuracy: 0.7094 - val_loss: 0.5585
Epoch 150/1000
19/19          0s 5ms/step -
accuracy: 0.7259 - loss: 0.5448 - val_accuracy: 0.7094 - val_loss: 0.5584
Epoch 151/1000
19/19          0s 9ms/step -
accuracy: 0.6846 - loss: 0.5779 - val_accuracy: 0.7094 - val_loss: 0.5583
Epoch 152/1000
19/19          0s 5ms/step -
accuracy: 0.7048 - loss: 0.5550 - val_accuracy: 0.7094 - val_loss: 0.5582
Epoch 153/1000
19/19          0s 4ms/step -

```

accuracy: 0.7022 - loss: 0.5679 - val_accuracy: 0.7094 - val_loss: 0.5580
 Epoch 154/1000
 19/19 0s 5ms/step -
 accuracy: 0.7086 - loss: 0.5556 - val_accuracy: 0.7094 - val_loss: 0.5579
 Epoch 155/1000
 19/19 0s 6ms/step -
 accuracy: 0.7171 - loss: 0.5471 - val_accuracy: 0.7094 - val_loss: 0.5577
 Epoch 156/1000
 19/19 0s 9ms/step -
 accuracy: 0.7472 - loss: 0.5307 - val_accuracy: 0.7094 - val_loss: 0.5575
 Epoch 157/1000
 19/19 0s 5ms/step -
 accuracy: 0.7084 - loss: 0.5514 - val_accuracy: 0.7094 - val_loss: 0.5574
 Epoch 158/1000
 19/19 0s 4ms/step -
 accuracy: 0.6996 - loss: 0.5665 - val_accuracy: 0.7094 - val_loss: 0.5573
 Epoch 159/1000
 19/19 0s 5ms/step -
 accuracy: 0.7373 - loss: 0.5246 - val_accuracy: 0.7094 - val_loss: 0.5571
 Epoch 160/1000
 19/19 0s 5ms/step -
 accuracy: 0.7253 - loss: 0.5482 - val_accuracy: 0.7094 - val_loss: 0.5569
 Epoch 161/1000
 19/19 0s 7ms/step -
 accuracy: 0.7082 - loss: 0.5510 - val_accuracy: 0.7094 - val_loss: 0.5567
 Epoch 162/1000
 19/19 0s 4ms/step -
 accuracy: 0.7233 - loss: 0.5350 - val_accuracy: 0.7094 - val_loss: 0.5566
 Epoch 163/1000
 19/19 0s 5ms/step -
 accuracy: 0.6937 - loss: 0.5708 - val_accuracy: 0.7094 - val_loss: 0.5565
 Epoch 164/1000
 19/19 0s 5ms/step -
 accuracy: 0.7380 - loss: 0.5372 - val_accuracy: 0.7094 - val_loss: 0.5563
 Epoch 165/1000
 19/19 0s 5ms/step -
 accuracy: 0.7496 - loss: 0.5179 - val_accuracy: 0.7094 - val_loss: 0.5561
 Epoch 166/1000
 19/19 0s 4ms/step -
 accuracy: 0.7036 - loss: 0.5571 - val_accuracy: 0.7094 - val_loss: 0.5559
 Epoch 167/1000
 19/19 0s 5ms/step -
 accuracy: 0.7307 - loss: 0.5265 - val_accuracy: 0.7094 - val_loss: 0.5558
 Epoch 168/1000
 19/19 0s 6ms/step -
 accuracy: 0.6951 - loss: 0.5689 - val_accuracy: 0.7094 - val_loss: 0.5557
 Epoch 169/1000
 19/19 0s 5ms/step -

```

accuracy: 0.7233 - loss: 0.5336 - val_accuracy: 0.7094 - val_loss: 0.5555
Epoch 170/1000
19/19          0s 8ms/step -
accuracy: 0.7363 - loss: 0.5328 - val_accuracy: 0.7094 - val_loss: 0.5554
Epoch 171/1000
19/19          0s 9ms/step -
accuracy: 0.6987 - loss: 0.5531 - val_accuracy: 0.7094 - val_loss: 0.5552
Epoch 172/1000
19/19          0s 5ms/step -
accuracy: 0.7060 - loss: 0.5473 - val_accuracy: 0.7094 - val_loss: 0.5551
Epoch 173/1000
19/19          0s 5ms/step -
accuracy: 0.7232 - loss: 0.5309 - val_accuracy: 0.7094 - val_loss: 0.5549
Epoch 174/1000
19/19          0s 5ms/step -
accuracy: 0.7127 - loss: 0.5427 - val_accuracy: 0.7094 - val_loss: 0.5548
Epoch 175/1000
19/19          0s 5ms/step -
accuracy: 0.7175 - loss: 0.5357 - val_accuracy: 0.7094 - val_loss: 0.5546
Epoch 176/1000
19/19          0s 5ms/step -
accuracy: 0.7175 - loss: 0.5400 - val_accuracy: 0.7094 - val_loss: 0.5545
Epoch 177/1000
19/19          0s 5ms/step -
accuracy: 0.7001 - loss: 0.5457 - val_accuracy: 0.7094 - val_loss: 0.5544
Epoch 178/1000
19/19          0s 5ms/step -
accuracy: 0.7134 - loss: 0.5450 - val_accuracy: 0.7179 - val_loss: 0.5542
Epoch 179/1000
19/19          0s 6ms/step -
accuracy: 0.7038 - loss: 0.5535 - val_accuracy: 0.7179 - val_loss: 0.5541
Epoch 180/1000
19/19          0s 8ms/step -
accuracy: 0.7295 - loss: 0.5324 - val_accuracy: 0.7179 - val_loss: 0.5540
Epoch 181/1000
19/19          0s 6ms/step -
accuracy: 0.6844 - loss: 0.5665 - val_accuracy: 0.7179 - val_loss: 0.5539
Epoch 182/1000
19/19          0s 6ms/step -
accuracy: 0.6992 - loss: 0.5522 - val_accuracy: 0.7179 - val_loss: 0.5539
Epoch 183/1000
19/19          0s 5ms/step -
accuracy: 0.7304 - loss: 0.5439 - val_accuracy: 0.7179 - val_loss: 0.5537
Epoch 184/1000
19/19          0s 5ms/step -
accuracy: 0.6874 - loss: 0.5603 - val_accuracy: 0.7179 - val_loss: 0.5536
Epoch 185/1000
19/19          0s 5ms/step -

```


accuracy: 0.7229 - loss: 0.5386 - val_accuracy: 0.7179 - val_loss: 0.5533
 Epoch 186/1000
 19/19 0s 5ms/step -
 accuracy: 0.7248 - loss: 0.5405 - val_accuracy: 0.7179 - val_loss: 0.5532
 Epoch 187/1000
 19/19 0s 5ms/step -
 accuracy: 0.7065 - loss: 0.5655 - val_accuracy: 0.7179 - val_loss: 0.5530
 Epoch 188/1000
 19/19 0s 5ms/step -
 accuracy: 0.7269 - loss: 0.5301 - val_accuracy: 0.7179 - val_loss: 0.5528
 Epoch 189/1000
 19/19 0s 9ms/step -
 accuracy: 0.7219 - loss: 0.5384 - val_accuracy: 0.7179 - val_loss: 0.5527
 Epoch 190/1000
 19/19 0s 6ms/step -
 accuracy: 0.7052 - loss: 0.5472 - val_accuracy: 0.7179 - val_loss: 0.5527
 Epoch 191/1000
 19/19 0s 5ms/step -
 accuracy: 0.6821 - loss: 0.5705 - val_accuracy: 0.7179 - val_loss: 0.5526
 Epoch 192/1000
 19/19 0s 6ms/step -
 accuracy: 0.7207 - loss: 0.5364 - val_accuracy: 0.7179 - val_loss: 0.5524
 Epoch 193/1000
 19/19 0s 9ms/step -
 accuracy: 0.7037 - loss: 0.5538 - val_accuracy: 0.7179 - val_loss: 0.5523
 Epoch 194/1000
 19/19 0s 5ms/step -
 accuracy: 0.7265 - loss: 0.5443 - val_accuracy: 0.7094 - val_loss: 0.5520
 Epoch 195/1000
 19/19 0s 5ms/step -
 accuracy: 0.7033 - loss: 0.5492 - val_accuracy: 0.7179 - val_loss: 0.5520
 Epoch 196/1000
 19/19 0s 6ms/step -
 accuracy: 0.6866 - loss: 0.5827 - val_accuracy: 0.7179 - val_loss: 0.5519
 Epoch 197/1000
 19/19 0s 8ms/step -
 accuracy: 0.7288 - loss: 0.5408 - val_accuracy: 0.7179 - val_loss: 0.5517
 Epoch 198/1000
 19/19 0s 6ms/step -
 accuracy: 0.7130 - loss: 0.5529 - val_accuracy: 0.7179 - val_loss: 0.5516
 Epoch 199/1000
 19/19 0s 6ms/step -
 accuracy: 0.7393 - loss: 0.5219 - val_accuracy: 0.7179 - val_loss: 0.5515
 Epoch 200/1000
 19/19 0s 6ms/step -
 accuracy: 0.7154 - loss: 0.5310 - val_accuracy: 0.7094 - val_loss: 0.5514
 Epoch 201/1000
 19/19 0s 5ms/step -

accuracy: 0.7248 - loss: 0.5352 - val_accuracy: 0.7094 - val_loss: 0.5512
 Epoch 202/1000
 19/19 0s 5ms/step -
 accuracy: 0.7187 - loss: 0.5406 - val_accuracy: 0.7094 - val_loss: 0.5511
 Epoch 203/1000
 19/19 0s 5ms/step -
 accuracy: 0.6981 - loss: 0.5781 - val_accuracy: 0.7094 - val_loss: 0.5510
 Epoch 204/1000
 19/19 0s 5ms/step -
 accuracy: 0.6976 - loss: 0.5552 - val_accuracy: 0.7094 - val_loss: 0.5510
 Epoch 205/1000
 19/19 0s 8ms/step -
 accuracy: 0.7356 - loss: 0.5359 - val_accuracy: 0.7094 - val_loss: 0.5508
 Epoch 206/1000
 19/19 0s 6ms/step -
 accuracy: 0.7041 - loss: 0.5548 - val_accuracy: 0.7094 - val_loss: 0.5506
 Epoch 207/1000
 19/19 0s 5ms/step -
 accuracy: 0.7121 - loss: 0.5401 - val_accuracy: 0.7094 - val_loss: 0.5504
 Epoch 208/1000
 19/19 0s 5ms/step -
 accuracy: 0.7020 - loss: 0.5356 - val_accuracy: 0.7094 - val_loss: 0.5503
 Epoch 209/1000
 19/19 0s 5ms/step -
 accuracy: 0.7038 - loss: 0.5594 - val_accuracy: 0.7094 - val_loss: 0.5502
 Epoch 210/1000
 19/19 0s 6ms/step -
 accuracy: 0.7226 - loss: 0.5417 - val_accuracy: 0.7094 - val_loss: 0.5500
 Epoch 211/1000
 19/19 0s 6ms/step -
 accuracy: 0.6904 - loss: 0.5624 - val_accuracy: 0.7094 - val_loss: 0.5499
 Epoch 212/1000
 19/19 0s 6ms/step -
 accuracy: 0.6998 - loss: 0.5466 - val_accuracy: 0.7094 - val_loss: 0.5499
 Epoch 213/1000
 19/19 0s 8ms/step -
 accuracy: 0.7248 - loss: 0.5293 - val_accuracy: 0.7094 - val_loss: 0.5498
 Epoch 214/1000
 19/19 0s 6ms/step -
 accuracy: 0.6951 - loss: 0.5554 - val_accuracy: 0.7094 - val_loss: 0.5496
 Epoch 215/1000
 19/19 0s 9ms/step -
 accuracy: 0.7086 - loss: 0.5350 - val_accuracy: 0.7094 - val_loss: 0.5495
 Epoch 216/1000
 19/19 0s 6ms/step -
 accuracy: 0.6764 - loss: 0.5809 - val_accuracy: 0.7094 - val_loss: 0.5495
 Epoch 217/1000
 19/19 0s 5ms/step -

accuracy: 0.6976 - loss: 0.5420 - val_accuracy: 0.7094 - val_loss: 0.5494
 Epoch 218/1000
 19/19 0s 6ms/step -
 accuracy: 0.7073 - loss: 0.5475 - val_accuracy: 0.7094 - val_loss: 0.5493
 Epoch 219/1000
 19/19 0s 6ms/step -
 accuracy: 0.7178 - loss: 0.5343 - val_accuracy: 0.7094 - val_loss: 0.5492
 Epoch 220/1000
 19/19 0s 6ms/step -
 accuracy: 0.6926 - loss: 0.5588 - val_accuracy: 0.7094 - val_loss: 0.5491
 Epoch 221/1000
 19/19 0s 8ms/step -
 accuracy: 0.7046 - loss: 0.5453 - val_accuracy: 0.7094 - val_loss: 0.5490
 Epoch 222/1000
 19/19 0s 5ms/step -
 accuracy: 0.7147 - loss: 0.5347 - val_accuracy: 0.7094 - val_loss: 0.5488
 Epoch 223/1000
 19/19 0s 5ms/step -
 accuracy: 0.7056 - loss: 0.5338 - val_accuracy: 0.7094 - val_loss: 0.5487
 Epoch 224/1000
 19/19 0s 6ms/step -
 accuracy: 0.7109 - loss: 0.5437 - val_accuracy: 0.7094 - val_loss: 0.5484
 Epoch 225/1000
 19/19 0s 6ms/step -
 accuracy: 0.7435 - loss: 0.5128 - val_accuracy: 0.7094 - val_loss: 0.5483
 Epoch 226/1000
 19/19 0s 6ms/step -
 accuracy: 0.6958 - loss: 0.5430 - val_accuracy: 0.7094 - val_loss: 0.5483
 Epoch 227/1000
 19/19 0s 5ms/step -
 accuracy: 0.7199 - loss: 0.5364 - val_accuracy: 0.7094 - val_loss: 0.5482
 Epoch 228/1000
 19/19 0s 6ms/step -
 accuracy: 0.7247 - loss: 0.5401 - val_accuracy: 0.7094 - val_loss: 0.5479
 Epoch 229/1000
 19/19 0s 8ms/step -
 accuracy: 0.7046 - loss: 0.5529 - val_accuracy: 0.7094 - val_loss: 0.5479
 Epoch 230/1000
 19/19 0s 6ms/step -
 accuracy: 0.6836 - loss: 0.5817 - val_accuracy: 0.7094 - val_loss: 0.5478
 Epoch 231/1000
 19/19 0s 5ms/step -
 accuracy: 0.6965 - loss: 0.5625 - val_accuracy: 0.7094 - val_loss: 0.5477
 Epoch 232/1000
 19/19 0s 6ms/step -
 accuracy: 0.7144 - loss: 0.5509 - val_accuracy: 0.7094 - val_loss: 0.5476
 Epoch 233/1000
 19/19 0s 8ms/step -

accuracy: 0.7085 - loss: 0.5472 - val_accuracy: 0.7094 - val_loss: 0.5475
 Epoch 234/1000
 19/19 0s 6ms/step -
 accuracy: 0.7158 - loss: 0.5336 - val_accuracy: 0.7094 - val_loss: 0.5474
 Epoch 235/1000
 19/19 0s 6ms/step -
 accuracy: 0.7409 - loss: 0.5107 - val_accuracy: 0.7094 - val_loss: 0.5473
 Epoch 236/1000
 19/19 0s 6ms/step -
 accuracy: 0.6818 - loss: 0.5710 - val_accuracy: 0.7094 - val_loss: 0.5471
 Epoch 237/1000
 19/19 0s 5ms/step -
 accuracy: 0.6913 - loss: 0.5438 - val_accuracy: 0.7094 - val_loss: 0.5470
 Epoch 238/1000
 19/19 0s 5ms/step -
 accuracy: 0.7065 - loss: 0.5574 - val_accuracy: 0.7094 - val_loss: 0.5469
 Epoch 239/1000
 19/19 0s 7ms/step -
 accuracy: 0.6906 - loss: 0.5580 - val_accuracy: 0.7094 - val_loss: 0.5469
 Epoch 240/1000
 19/19 0s 6ms/step -
 accuracy: 0.6773 - loss: 0.5529 - val_accuracy: 0.7094 - val_loss: 0.5468
 Epoch 241/1000
 19/19 0s 6ms/step -
 accuracy: 0.7228 - loss: 0.5280 - val_accuracy: 0.7094 - val_loss: 0.5466
 Epoch 242/1000
 19/19 0s 6ms/step -
 accuracy: 0.7349 - loss: 0.5155 - val_accuracy: 0.7094 - val_loss: 0.5464
 Epoch 243/1000
 19/19 0s 6ms/step -
 accuracy: 0.7149 - loss: 0.5388 - val_accuracy: 0.7094 - val_loss: 0.5463
 Epoch 244/1000
 19/19 0s 5ms/step -
 accuracy: 0.6991 - loss: 0.5388 - val_accuracy: 0.7094 - val_loss: 0.5463
 Epoch 245/1000
 19/19 0s 5ms/step -
 accuracy: 0.7212 - loss: 0.5303 - val_accuracy: 0.7094 - val_loss: 0.5462
 Epoch 246/1000
 19/19 0s 7ms/step -
 accuracy: 0.7496 - loss: 0.5165 - val_accuracy: 0.7094 - val_loss: 0.5460
 Epoch 247/1000
 19/19 0s 5ms/step -
 accuracy: 0.7369 - loss: 0.5292 - val_accuracy: 0.7094 - val_loss: 0.5458
 Epoch 248/1000
 19/19 0s 5ms/step -
 accuracy: 0.7181 - loss: 0.5400 - val_accuracy: 0.7179 - val_loss: 0.5457
 Epoch 249/1000
 19/19 0s 5ms/step -

accuracy: 0.7300 - loss: 0.5333 - val_accuracy: 0.7179 - val_loss: 0.5456
 Epoch 250/1000
 19/19 0s 6ms/step -
 accuracy: 0.7298 - loss: 0.5227 - val_accuracy: 0.7094 - val_loss: 0.5455
 Epoch 251/1000
 19/19 0s 6ms/step -
 accuracy: 0.7208 - loss: 0.5209 - val_accuracy: 0.7094 - val_loss: 0.5455
 Epoch 252/1000
 19/19 0s 5ms/step -
 accuracy: 0.7023 - loss: 0.5468 - val_accuracy: 0.7094 - val_loss: 0.5454
 Epoch 253/1000
 19/19 0s 8ms/step -
 accuracy: 0.7099 - loss: 0.5266 - val_accuracy: 0.7179 - val_loss: 0.5452
 Epoch 254/1000
 19/19 0s 5ms/step -
 accuracy: 0.7075 - loss: 0.5289 - val_accuracy: 0.7179 - val_loss: 0.5451
 Epoch 255/1000
 19/19 0s 6ms/step -
 accuracy: 0.6989 - loss: 0.5396 - val_accuracy: 0.7094 - val_loss: 0.5451
 Epoch 256/1000
 19/19 0s 8ms/step -
 accuracy: 0.7081 - loss: 0.5555 - val_accuracy: 0.7094 - val_loss: 0.5451
 Epoch 257/1000
 19/19 0s 5ms/step -
 accuracy: 0.7300 - loss: 0.5193 - val_accuracy: 0.7179 - val_loss: 0.5449
 Epoch 258/1000
 19/19 0s 5ms/step -
 accuracy: 0.7040 - loss: 0.5327 - val_accuracy: 0.7179 - val_loss: 0.5448
 Epoch 259/1000
 19/19 0s 5ms/step -
 accuracy: 0.7171 - loss: 0.5297 - val_accuracy: 0.7179 - val_loss: 0.5447
 Epoch 260/1000
 19/19 0s 7ms/step -
 accuracy: 0.7038 - loss: 0.5475 - val_accuracy: 0.7179 - val_loss: 0.5446
 Epoch 261/1000
 19/19 0s 5ms/step -
 accuracy: 0.7165 - loss: 0.5342 - val_accuracy: 0.7179 - val_loss: 0.5445
 Epoch 262/1000
 19/19 0s 6ms/step -
 accuracy: 0.6910 - loss: 0.5380 - val_accuracy: 0.7179 - val_loss: 0.5443
 Epoch 263/1000
 19/19 0s 5ms/step -
 accuracy: 0.7020 - loss: 0.5404 - val_accuracy: 0.7179 - val_loss: 0.5441
 Epoch 264/1000
 19/19 0s 5ms/step -
 accuracy: 0.6669 - loss: 0.5646 - val_accuracy: 0.7179 - val_loss: 0.5441
 Epoch 265/1000
 19/19 0s 5ms/step -

accuracy: 0.6873 - loss: 0.5652 - val_accuracy: 0.7179 - val_loss: 0.5441
 Epoch 266/1000
 19/19 0s 6ms/step -
 accuracy: 0.7265 - loss: 0.5292 - val_accuracy: 0.7179 - val_loss: 0.5438
 Epoch 267/1000
 19/19 0s 7ms/step -
 accuracy: 0.7111 - loss: 0.5363 - val_accuracy: 0.7179 - val_loss: 0.5438
 Epoch 268/1000
 19/19 0s 6ms/step -
 accuracy: 0.7045 - loss: 0.5388 - val_accuracy: 0.7179 - val_loss: 0.5437
 Epoch 269/1000
 19/19 0s 5ms/step -
 accuracy: 0.6486 - loss: 0.5875 - val_accuracy: 0.7179 - val_loss: 0.5438
 Epoch 270/1000
 19/19 0s 6ms/step -
 accuracy: 0.7328 - loss: 0.5149 - val_accuracy: 0.7179 - val_loss: 0.5435
 Epoch 271/1000
 19/19 0s 5ms/step -
 accuracy: 0.6969 - loss: 0.5465 - val_accuracy: 0.7179 - val_loss: 0.5434
 Epoch 272/1000
 19/19 0s 5ms/step -
 accuracy: 0.7122 - loss: 0.5239 - val_accuracy: 0.7179 - val_loss: 0.5433
 Epoch 273/1000
 19/19 0s 6ms/step -
 accuracy: 0.6805 - loss: 0.5505 - val_accuracy: 0.7179 - val_loss: 0.5433
 Epoch 274/1000
 19/19 0s 8ms/step -
 accuracy: 0.7078 - loss: 0.5360 - val_accuracy: 0.7179 - val_loss: 0.5432
 Epoch 275/1000
 19/19 0s 6ms/step -
 accuracy: 0.7153 - loss: 0.5289 - val_accuracy: 0.7179 - val_loss: 0.5431
 Epoch 276/1000
 19/19 0s 9ms/step -
 accuracy: 0.7155 - loss: 0.5226 - val_accuracy: 0.7179 - val_loss: 0.5430
 Epoch 277/1000
 19/19 0s 6ms/step -
 accuracy: 0.7456 - loss: 0.5096 - val_accuracy: 0.7179 - val_loss: 0.5428
 Epoch 278/1000
 19/19 0s 5ms/step -
 accuracy: 0.7160 - loss: 0.5303 - val_accuracy: 0.7179 - val_loss: 0.5427
 Epoch 279/1000
 19/19 0s 8ms/step -
 accuracy: 0.6917 - loss: 0.5533 - val_accuracy: 0.7179 - val_loss: 0.5427
 Epoch 280/1000
 19/19 0s 6ms/step -
 accuracy: 0.7226 - loss: 0.5392 - val_accuracy: 0.7179 - val_loss: 0.5425
 Epoch 281/1000
 19/19 0s 6ms/step -

accuracy: 0.6923 - loss: 0.5537 - val_accuracy: 0.7179 - val_loss: 0.5424
 Epoch 282/1000
 19/19 0s 5ms/step -
 accuracy: 0.6829 - loss: 0.5628 - val_accuracy: 0.7179 - val_loss: 0.5423
 Epoch 283/1000
 19/19 0s 5ms/step -
 accuracy: 0.7086 - loss: 0.5298 - val_accuracy: 0.7179 - val_loss: 0.5421
 Epoch 284/1000
 19/19 0s 5ms/step -
 accuracy: 0.7252 - loss: 0.5241 - val_accuracy: 0.7179 - val_loss: 0.5420
 Epoch 285/1000
 19/19 0s 8ms/step -
 accuracy: 0.6933 - loss: 0.5430 - val_accuracy: 0.7179 - val_loss: 0.5420
 Epoch 286/1000
 19/19 0s 6ms/step -
 accuracy: 0.6839 - loss: 0.5456 - val_accuracy: 0.7179 - val_loss: 0.5420
 Epoch 287/1000
 19/19 0s 5ms/step -
 accuracy: 0.6808 - loss: 0.5488 - val_accuracy: 0.7179 - val_loss: 0.5418
 Epoch 288/1000
 19/19 0s 5ms/step -
 accuracy: 0.7227 - loss: 0.5243 - val_accuracy: 0.7179 - val_loss: 0.5417
 Epoch 289/1000
 19/19 0s 6ms/step -
 accuracy: 0.7313 - loss: 0.5175 - val_accuracy: 0.7179 - val_loss: 0.5414
 Epoch 290/1000
 19/19 0s 5ms/step -
 accuracy: 0.6896 - loss: 0.5528 - val_accuracy: 0.7179 - val_loss: 0.5414
 Epoch 291/1000
 19/19 0s 8ms/step -
 accuracy: 0.7095 - loss: 0.5523 - val_accuracy: 0.7179 - val_loss: 0.5413
 Epoch 292/1000
 19/19 0s 5ms/step -
 accuracy: 0.7038 - loss: 0.5487 - val_accuracy: 0.7179 - val_loss: 0.5412
 Epoch 293/1000
 19/19 0s 5ms/step -
 accuracy: 0.7168 - loss: 0.5254 - val_accuracy: 0.7179 - val_loss: 0.5412
 Epoch 294/1000
 19/19 0s 5ms/step -
 accuracy: 0.7216 - loss: 0.5296 - val_accuracy: 0.7179 - val_loss: 0.5410
 Epoch 295/1000
 19/19 0s 8ms/step -
 accuracy: 0.7042 - loss: 0.5361 - val_accuracy: 0.7179 - val_loss: 0.5409
 Epoch 296/1000
 19/19 0s 6ms/step -
 accuracy: 0.7055 - loss: 0.5437 - val_accuracy: 0.7265 - val_loss: 0.5406
 Epoch 297/1000
 19/19 0s 8ms/step -

accuracy: 0.7348 - loss: 0.5070 - val_accuracy: 0.7265 - val_loss: 0.5404
 Epoch 298/1000
 19/19 0s 5ms/step -
 accuracy: 0.7012 - loss: 0.5454 - val_accuracy: 0.7265 - val_loss: 0.5403
 Epoch 299/1000
 19/19 0s 5ms/step -
 accuracy: 0.7430 - loss: 0.5110 - val_accuracy: 0.7265 - val_loss: 0.5401
 Epoch 300/1000
 19/19 0s 5ms/step -
 accuracy: 0.7272 - loss: 0.5353 - val_accuracy: 0.7265 - val_loss: 0.5401
 Epoch 301/1000
 19/19 0s 5ms/step -
 accuracy: 0.7274 - loss: 0.5157 - val_accuracy: 0.7265 - val_loss: 0.5400
 Epoch 302/1000
 19/19 0s 5ms/step -
 accuracy: 0.7039 - loss: 0.5454 - val_accuracy: 0.7265 - val_loss: 0.5400
 Epoch 303/1000
 19/19 0s 9ms/step -
 accuracy: 0.7465 - loss: 0.5137 - val_accuracy: 0.7265 - val_loss: 0.5398
 Epoch 304/1000
 19/19 0s 6ms/step -
 accuracy: 0.6916 - loss: 0.5569 - val_accuracy: 0.7265 - val_loss: 0.5397
 Epoch 305/1000
 19/19 0s 5ms/step -
 accuracy: 0.7120 - loss: 0.5326 - val_accuracy: 0.7265 - val_loss: 0.5397
 Epoch 306/1000
 19/19 0s 5ms/step -
 accuracy: 0.7359 - loss: 0.5239 - val_accuracy: 0.7265 - val_loss: 0.5395
 Epoch 307/1000
 19/19 0s 6ms/step -
 accuracy: 0.7166 - loss: 0.5441 - val_accuracy: 0.7265 - val_loss: 0.5395
 Epoch 308/1000
 19/19 0s 5ms/step -
 accuracy: 0.7402 - loss: 0.5229 - val_accuracy: 0.7265 - val_loss: 0.5393
 Epoch 309/1000
 19/19 0s 8ms/step -
 accuracy: 0.7476 - loss: 0.5183 - val_accuracy: 0.7265 - val_loss: 0.5392
 Epoch 310/1000
 19/19 0s 6ms/step -
 accuracy: 0.7090 - loss: 0.5185 - val_accuracy: 0.7265 - val_loss: 0.5393
 Epoch 311/1000
 19/19 0s 6ms/step -
 accuracy: 0.7294 - loss: 0.5161 - val_accuracy: 0.7265 - val_loss: 0.5392
 Epoch 312/1000
 19/19 0s 6ms/step -
 accuracy: 0.7325 - loss: 0.5160 - val_accuracy: 0.7265 - val_loss: 0.5391
 Epoch 313/1000
 19/19 0s 6ms/step -

accuracy: 0.6948 - loss: 0.5552 - val_accuracy: 0.7265 - val_loss: 0.5390
 Epoch 314/1000
 19/19 0s 6ms/step -
 accuracy: 0.6872 - loss: 0.5426 - val_accuracy: 0.7265 - val_loss: 0.5390
 Epoch 315/1000
 19/19 0s 7ms/step -
 accuracy: 0.7052 - loss: 0.5378 - val_accuracy: 0.7265 - val_loss: 0.5389
 Epoch 316/1000
 19/19 0s 8ms/step -
 accuracy: 0.6860 - loss: 0.5693 - val_accuracy: 0.7265 - val_loss: 0.5390
 Epoch 317/1000
 19/19 0s 6ms/step -
 accuracy: 0.7095 - loss: 0.5510 - val_accuracy: 0.7265 - val_loss: 0.5390
 Epoch 318/1000
 19/19 0s 9ms/step -
 accuracy: 0.7026 - loss: 0.5312 - val_accuracy: 0.7265 - val_loss: 0.5387
 Epoch 319/1000
 19/19 0s 7ms/step -
 accuracy: 0.7189 - loss: 0.5129 - val_accuracy: 0.7265 - val_loss: 0.5386
 Epoch 320/1000
 19/19 0s 8ms/step -
 accuracy: 0.7097 - loss: 0.5278 - val_accuracy: 0.7265 - val_loss: 0.5386
 Epoch 321/1000
 19/19 0s 6ms/step -
 accuracy: 0.7092 - loss: 0.5437 - val_accuracy: 0.7265 - val_loss: 0.5384
 Epoch 322/1000
 19/19 0s 6ms/step -
 accuracy: 0.7497 - loss: 0.5090 - val_accuracy: 0.7179 - val_loss: 0.5382
 Epoch 323/1000
 19/19 0s 7ms/step -
 accuracy: 0.7312 - loss: 0.5295 - val_accuracy: 0.7179 - val_loss: 0.5380
 Epoch 324/1000
 19/19 0s 12ms/step -
 accuracy: 0.7246 - loss: 0.5318 - val_accuracy: 0.7265 - val_loss: 0.5381
 Epoch 325/1000
 19/19 0s 10ms/step -
 accuracy: 0.7135 - loss: 0.5381 - val_accuracy: 0.7265 - val_loss: 0.5381
 Epoch 326/1000
 19/19 0s 8ms/step -
 accuracy: 0.7189 - loss: 0.5298 - val_accuracy: 0.7265 - val_loss: 0.5380
 Epoch 327/1000
 19/19 0s 6ms/step -
 accuracy: 0.7182 - loss: 0.5401 - val_accuracy: 0.7265 - val_loss: 0.5379
 Epoch 328/1000
 19/19 0s 6ms/step -
 accuracy: 0.7263 - loss: 0.5296 - val_accuracy: 0.7265 - val_loss: 0.5378
 Epoch 329/1000
 19/19 0s 7ms/step -

accuracy: 0.7360 - loss: 0.5106 - val_accuracy: 0.7265 - val_loss: 0.5377
 Epoch 330/1000
 19/19 0s 10ms/step -
 accuracy: 0.6980 - loss: 0.5437 - val_accuracy: 0.7265 - val_loss: 0.5376
 Epoch 331/1000
 19/19 0s 7ms/step -
 accuracy: 0.7156 - loss: 0.5299 - val_accuracy: 0.7265 - val_loss: 0.5375
 Epoch 332/1000
 19/19 0s 6ms/step -
 accuracy: 0.7163 - loss: 0.5310 - val_accuracy: 0.7265 - val_loss: 0.5374
 Epoch 333/1000
 19/19 0s 6ms/step -
 accuracy: 0.6954 - loss: 0.5451 - val_accuracy: 0.7265 - val_loss: 0.5375
 Epoch 334/1000
 19/19 0s 6ms/step -
 accuracy: 0.7156 - loss: 0.5203 - val_accuracy: 0.7179 - val_loss: 0.5373
 Epoch 335/1000
 19/19 0s 9ms/step -
 accuracy: 0.7517 - loss: 0.5009 - val_accuracy: 0.7179 - val_loss: 0.5371
 Epoch 336/1000
 19/19 0s 6ms/step -
 accuracy: 0.7100 - loss: 0.5263 - val_accuracy: 0.7350 - val_loss: 0.5372
 Epoch 337/1000
 19/19 0s 6ms/step -
 accuracy: 0.7209 - loss: 0.5262 - val_accuracy: 0.7350 - val_loss: 0.5371
 Epoch 338/1000
 19/19 0s 6ms/step -
 accuracy: 0.7429 - loss: 0.5148 - val_accuracy: 0.7179 - val_loss: 0.5370
 Epoch 339/1000
 19/19 0s 6ms/step -
 accuracy: 0.7142 - loss: 0.5317 - val_accuracy: 0.7265 - val_loss: 0.5369
 Epoch 340/1000
 19/19 0s 8ms/step -
 accuracy: 0.6811 - loss: 0.5522 - val_accuracy: 0.7179 - val_loss: 0.5368
 Epoch 341/1000
 19/19 0s 6ms/step -
 accuracy: 0.7466 - loss: 0.5089 - val_accuracy: 0.7179 - val_loss: 0.5366
 Epoch 342/1000
 19/19 0s 7ms/step -
 accuracy: 0.7383 - loss: 0.5071 - val_accuracy: 0.7179 - val_loss: 0.5365
 Epoch 343/1000
 19/19 0s 6ms/step -
 accuracy: 0.7332 - loss: 0.5250 - val_accuracy: 0.7179 - val_loss: 0.5364
 Epoch 344/1000
 19/19 0s 6ms/step -
 accuracy: 0.7087 - loss: 0.5201 - val_accuracy: 0.7179 - val_loss: 0.5364
 Epoch 345/1000
 19/19 0s 8ms/step -

accuracy: 0.7486 - loss: 0.4871 - val_accuracy: 0.7179 - val_loss: 0.5363
 Epoch 346/1000
 19/19 0s 6ms/step -
 accuracy: 0.7232 - loss: 0.5042 - val_accuracy: 0.7179 - val_loss: 0.5363
 Epoch 347/1000
 19/19 0s 5ms/step -
 accuracy: 0.7097 - loss: 0.5484 - val_accuracy: 0.7179 - val_loss: 0.5363
 Epoch 348/1000
 19/19 0s 6ms/step -
 accuracy: 0.6962 - loss: 0.5442 - val_accuracy: 0.7179 - val_loss: 0.5361
 Epoch 349/1000
 19/19 0s 5ms/step -
 accuracy: 0.6926 - loss: 0.5392 - val_accuracy: 0.7179 - val_loss: 0.5362
 Epoch 350/1000
 19/19 0s 9ms/step -
 accuracy: 0.7293 - loss: 0.5162 - val_accuracy: 0.7179 - val_loss: 0.5360
 Epoch 351/1000
 19/19 0s 8ms/step -
 accuracy: 0.7253 - loss: 0.5339 - val_accuracy: 0.7179 - val_loss: 0.5359
 Epoch 352/1000
 19/19 0s 7ms/step -
 accuracy: 0.7334 - loss: 0.5146 - val_accuracy: 0.7179 - val_loss: 0.5357
 Epoch 353/1000
 19/19 0s 7ms/step -
 accuracy: 0.7528 - loss: 0.4921 - val_accuracy: 0.7179 - val_loss: 0.5355
 Epoch 354/1000
 19/19 0s 7ms/step -
 accuracy: 0.7326 - loss: 0.5219 - val_accuracy: 0.7179 - val_loss: 0.5354
 Epoch 355/1000
 19/19 0s 12ms/step -
 accuracy: 0.7402 - loss: 0.5150 - val_accuracy: 0.7179 - val_loss: 0.5354
 Epoch 356/1000
 19/19 0s 8ms/step -
 accuracy: 0.7174 - loss: 0.5496 - val_accuracy: 0.7179 - val_loss: 0.5353
 Epoch 357/1000
 19/19 0s 8ms/step -
 accuracy: 0.7208 - loss: 0.5219 - val_accuracy: 0.7179 - val_loss: 0.5354
 Epoch 358/1000
 19/19 0s 7ms/step -
 accuracy: 0.7174 - loss: 0.5319 - val_accuracy: 0.7179 - val_loss: 0.5354
 Epoch 359/1000
 19/19 0s 8ms/step -
 accuracy: 0.7135 - loss: 0.5242 - val_accuracy: 0.7179 - val_loss: 0.5353
 Epoch 360/1000
 19/19 0s 7ms/step -
 accuracy: 0.7273 - loss: 0.5236 - val_accuracy: 0.7179 - val_loss: 0.5351
 Epoch 361/1000
 19/19 0s 6ms/step -

accuracy: 0.7395 - loss: 0.4978 - val_accuracy: 0.7179 - val_loss: 0.5350
 Epoch 362/1000
 19/19 0s 7ms/step -
 accuracy: 0.7113 - loss: 0.5244 - val_accuracy: 0.7179 - val_loss: 0.5349
 Epoch 363/1000
 19/19 0s 7ms/step -
 accuracy: 0.7315 - loss: 0.5189 - val_accuracy: 0.7179 - val_loss: 0.5347
 Epoch 364/1000
 19/19 0s 9ms/step -
 accuracy: 0.7365 - loss: 0.5149 - val_accuracy: 0.7179 - val_loss: 0.5346
 Epoch 365/1000
 19/19 0s 7ms/step -
 accuracy: 0.7248 - loss: 0.5311 - val_accuracy: 0.7179 - val_loss: 0.5346
 Epoch 366/1000
 19/19 0s 6ms/step -
 accuracy: 0.7171 - loss: 0.5269 - val_accuracy: 0.7179 - val_loss: 0.5345
 Epoch 367/1000
 19/19 0s 6ms/step -
 accuracy: 0.7442 - loss: 0.5119 - val_accuracy: 0.7179 - val_loss: 0.5345
 Epoch 368/1000
 19/19 0s 6ms/step -
 accuracy: 0.7503 - loss: 0.5144 - val_accuracy: 0.7179 - val_loss: 0.5344
 Epoch 369/1000
 19/19 0s 8ms/step -
 accuracy: 0.7290 - loss: 0.5309 - val_accuracy: 0.7179 - val_loss: 0.5346
 Epoch 370/1000
 19/19 0s 6ms/step -
 accuracy: 0.7545 - loss: 0.4856 - val_accuracy: 0.7179 - val_loss: 0.5345
 Epoch 371/1000
 19/19 0s 9ms/step -
 accuracy: 0.7291 - loss: 0.5122 - val_accuracy: 0.7179 - val_loss: 0.5343
 Epoch 372/1000
 19/19 0s 6ms/step -
 accuracy: 0.7013 - loss: 0.5487 - val_accuracy: 0.7179 - val_loss: 0.5343
 Epoch 373/1000
 19/19 0s 6ms/step -
 accuracy: 0.7104 - loss: 0.5304 - val_accuracy: 0.7179 - val_loss: 0.5343
 Epoch 374/1000
 19/19 0s 9ms/step -
 accuracy: 0.6931 - loss: 0.5421 - val_accuracy: 0.7179 - val_loss: 0.5342
 Epoch 375/1000
 19/19 0s 6ms/step -
 accuracy: 0.7423 - loss: 0.5072 - val_accuracy: 0.7179 - val_loss: 0.5339
 Epoch 376/1000
 19/19 0s 6ms/step -
 accuracy: 0.7177 - loss: 0.5400 - val_accuracy: 0.7179 - val_loss: 0.5340
 Epoch 377/1000
 19/19 0s 6ms/step -

accuracy: 0.7146 - loss: 0.5315 - val_accuracy: 0.7179 - val_loss: 0.5339
 Epoch 378/1000
 19/19 0s 6ms/step -
 accuracy: 0.7009 - loss: 0.5369 - val_accuracy: 0.7179 - val_loss: 0.5339
 Epoch 379/1000
 19/19 0s 8ms/step -
 accuracy: 0.7087 - loss: 0.5457 - val_accuracy: 0.7179 - val_loss: 0.5337
 Epoch 380/1000
 19/19 0s 6ms/step -
 accuracy: 0.7099 - loss: 0.5335 - val_accuracy: 0.7179 - val_loss: 0.5337
 Epoch 381/1000
 19/19 0s 6ms/step -
 accuracy: 0.7060 - loss: 0.5319 - val_accuracy: 0.7179 - val_loss: 0.5335
 Epoch 382/1000
 19/19 0s 5ms/step -
 accuracy: 0.7436 - loss: 0.5046 - val_accuracy: 0.7179 - val_loss: 0.5334
 Epoch 383/1000
 19/19 0s 5ms/step -
 accuracy: 0.7429 - loss: 0.5109 - val_accuracy: 0.7179 - val_loss: 0.5333
 Epoch 384/1000
 19/19 0s 8ms/step -
 accuracy: 0.7344 - loss: 0.5072 - val_accuracy: 0.7179 - val_loss: 0.5332
 Epoch 385/1000
 19/19 0s 6ms/step -
 accuracy: 0.6994 - loss: 0.5341 - val_accuracy: 0.7179 - val_loss: 0.5332
 Epoch 386/1000
 19/19 0s 6ms/step -
 accuracy: 0.7096 - loss: 0.5197 - val_accuracy: 0.7179 - val_loss: 0.5332
 Epoch 387/1000
 19/19 0s 5ms/step -
 accuracy: 0.7322 - loss: 0.5301 - val_accuracy: 0.7179 - val_loss: 0.5330
 Epoch 388/1000
 19/19 0s 7ms/step -
 accuracy: 0.6991 - loss: 0.5375 - val_accuracy: 0.7179 - val_loss: 0.5331
 Epoch 389/1000
 19/19 0s 6ms/step -
 accuracy: 0.7392 - loss: 0.5023 - val_accuracy: 0.7179 - val_loss: 0.5329
 Epoch 390/1000
 19/19 0s 5ms/step -
 accuracy: 0.7059 - loss: 0.5367 - val_accuracy: 0.7179 - val_loss: 0.5329
 Epoch 391/1000
 19/19 0s 5ms/step -
 accuracy: 0.7210 - loss: 0.5345 - val_accuracy: 0.7179 - val_loss: 0.5330
 Epoch 392/1000
 19/19 0s 7ms/step -
 accuracy: 0.7004 - loss: 0.5283 - val_accuracy: 0.7179 - val_loss: 0.5330
 Epoch 393/1000
 19/19 0s 6ms/step -

accuracy: 0.7429 - loss: 0.5100 - val_accuracy: 0.7179 - val_loss: 0.5326
 Epoch 394/1000
 19/19 0s 8ms/step -
 accuracy: 0.7142 - loss: 0.5265 - val_accuracy: 0.7179 - val_loss: 0.5325
 Epoch 395/1000
 19/19 0s 12ms/step -
 accuracy: 0.7437 - loss: 0.5006 - val_accuracy: 0.7179 - val_loss: 0.5324
 Epoch 396/1000
 19/19 0s 10ms/step -
 accuracy: 0.7079 - loss: 0.5333 - val_accuracy: 0.7179 - val_loss: 0.5325
 Epoch 397/1000
 19/19 0s 9ms/step -
 accuracy: 0.7096 - loss: 0.5462 - val_accuracy: 0.7179 - val_loss: 0.5325
 Epoch 398/1000
 19/19 0s 7ms/step -
 accuracy: 0.6967 - loss: 0.5528 - val_accuracy: 0.7179 - val_loss: 0.5324
 Epoch 399/1000
 19/19 0s 6ms/step -
 accuracy: 0.7091 - loss: 0.5381 - val_accuracy: 0.7179 - val_loss: 0.5323
 Epoch 400/1000
 19/19 0s 8ms/step -
 accuracy: 0.6922 - loss: 0.5531 - val_accuracy: 0.7179 - val_loss: 0.5322
 Epoch 401/1000
 19/19 0s 6ms/step -
 accuracy: 0.7569 - loss: 0.4822 - val_accuracy: 0.7179 - val_loss: 0.5321
 Epoch 402/1000
 19/19 0s 6ms/step -
 accuracy: 0.7266 - loss: 0.5049 - val_accuracy: 0.7179 - val_loss: 0.5320
 Epoch 403/1000
 19/19 0s 7ms/step -
 accuracy: 0.6697 - loss: 0.5700 - val_accuracy: 0.7179 - val_loss: 0.5320
 Epoch 404/1000
 19/19 0s 14ms/step -
 accuracy: 0.7307 - loss: 0.5215 - val_accuracy: 0.7179 - val_loss: 0.5321
 Epoch 405/1000
 19/19 0s 6ms/step -
 accuracy: 0.7190 - loss: 0.5249 - val_accuracy: 0.7179 - val_loss: 0.5320
 Epoch 406/1000
 19/19 0s 7ms/step -
 accuracy: 0.7061 - loss: 0.5213 - val_accuracy: 0.7179 - val_loss: 0.5320
 Epoch 407/1000
 19/19 0s 6ms/step -
 accuracy: 0.7234 - loss: 0.5274 - val_accuracy: 0.7179 - val_loss: 0.5318
 Epoch 408/1000
 19/19 0s 6ms/step -
 accuracy: 0.7380 - loss: 0.5060 - val_accuracy: 0.7179 - val_loss: 0.5315
 Epoch 409/1000
 19/19 0s 11ms/step -

accuracy: 0.7057 - loss: 0.5344 - val_accuracy: 0.7179 - val_loss: 0.5315
 Epoch 410/1000
 19/19 0s 6ms/step -
 accuracy: 0.7160 - loss: 0.5148 - val_accuracy: 0.7179 - val_loss: 0.5315
 Epoch 411/1000
 19/19 0s 6ms/step -
 accuracy: 0.7386 - loss: 0.5137 - val_accuracy: 0.7179 - val_loss: 0.5313
 Epoch 412/1000
 19/19 0s 7ms/step -
 accuracy: 0.6880 - loss: 0.5449 - val_accuracy: 0.7179 - val_loss: 0.5316
 Epoch 413/1000
 19/19 0s 6ms/step -
 accuracy: 0.7380 - loss: 0.5191 - val_accuracy: 0.7179 - val_loss: 0.5313
 Epoch 414/1000
 19/19 0s 6ms/step -
 accuracy: 0.6926 - loss: 0.5408 - val_accuracy: 0.7179 - val_loss: 0.5313
 Epoch 415/1000
 19/19 0s 6ms/step -
 accuracy: 0.7283 - loss: 0.5240 - val_accuracy: 0.7179 - val_loss: 0.5312
 Epoch 416/1000
 19/19 0s 6ms/step -
 accuracy: 0.7037 - loss: 0.5386 - val_accuracy: 0.7179 - val_loss: 0.5312
 Epoch 417/1000
 19/19 0s 6ms/step -
 accuracy: 0.7009 - loss: 0.5493 - val_accuracy: 0.7179 - val_loss: 0.5312
 Epoch 418/1000
 19/19 0s 6ms/step -
 accuracy: 0.7111 - loss: 0.5388 - val_accuracy: 0.7179 - val_loss: 0.5313
 Epoch 419/1000
 19/19 0s 7ms/step -
 accuracy: 0.7087 - loss: 0.5329 - val_accuracy: 0.7179 - val_loss: 0.5311
 Epoch 420/1000
 19/19 0s 7ms/step -
 accuracy: 0.7141 - loss: 0.5194 - val_accuracy: 0.7179 - val_loss: 0.5311
 Epoch 421/1000
 19/19 0s 6ms/step -
 accuracy: 0.6963 - loss: 0.5447 - val_accuracy: 0.7179 - val_loss: 0.5311
 Epoch 422/1000
 19/19 0s 8ms/step -
 accuracy: 0.7279 - loss: 0.5037 - val_accuracy: 0.7179 - val_loss: 0.5307
 Epoch 423/1000
 19/19 0s 15ms/step -
 accuracy: 0.7012 - loss: 0.5376 - val_accuracy: 0.7179 - val_loss: 0.5307
 Epoch 424/1000
 19/19 0s 7ms/step -
 accuracy: 0.7223 - loss: 0.5124 - val_accuracy: 0.7179 - val_loss: 0.5306
 Epoch 425/1000
 19/19 0s 6ms/step -

accuracy: 0.7085 - loss: 0.5272 - val_accuracy: 0.7179 - val_loss: 0.5305
 Epoch 426/1000
 19/19 0s 6ms/step -
 accuracy: 0.7205 - loss: 0.5015 - val_accuracy: 0.7179 - val_loss: 0.5305
 Epoch 427/1000
 19/19 0s 7ms/step -
 accuracy: 0.7243 - loss: 0.5356 - val_accuracy: 0.7179 - val_loss: 0.5303
 Epoch 428/1000
 19/19 0s 7ms/step -
 accuracy: 0.7572 - loss: 0.4926 - val_accuracy: 0.7179 - val_loss: 0.5302
 Epoch 429/1000
 19/19 0s 6ms/step -
 accuracy: 0.6903 - loss: 0.5520 - val_accuracy: 0.7179 - val_loss: 0.5302
 Epoch 430/1000
 19/19 0s 6ms/step -
 accuracy: 0.7470 - loss: 0.5056 - val_accuracy: 0.7265 - val_loss: 0.5299
 Epoch 431/1000
 19/19 0s 6ms/step -
 accuracy: 0.7378 - loss: 0.5186 - val_accuracy: 0.7265 - val_loss: 0.5299
 Epoch 432/1000
 19/19 0s 6ms/step -
 accuracy: 0.7346 - loss: 0.5144 - val_accuracy: 0.7265 - val_loss: 0.5297
 Epoch 433/1000
 19/19 0s 6ms/step -
 accuracy: 0.7087 - loss: 0.5153 - val_accuracy: 0.7265 - val_loss: 0.5297
 Epoch 434/1000
 19/19 0s 6ms/step -
 accuracy: 0.7313 - loss: 0.5138 - val_accuracy: 0.7179 - val_loss: 0.5297
 Epoch 435/1000
 19/19 0s 6ms/step -
 accuracy: 0.7328 - loss: 0.5191 - val_accuracy: 0.7179 - val_loss: 0.5298
 Epoch 436/1000
 19/19 0s 9ms/step -
 accuracy: 0.7027 - loss: 0.5203 - val_accuracy: 0.7179 - val_loss: 0.5299
 Epoch 437/1000
 19/19 0s 7ms/step -
 accuracy: 0.7351 - loss: 0.5058 - val_accuracy: 0.7179 - val_loss: 0.5297
 Epoch 438/1000
 19/19 0s 16ms/step -
 accuracy: 0.7379 - loss: 0.5210 - val_accuracy: 0.7179 - val_loss: 0.5295
 Epoch 439/1000
 19/19 0s 9ms/step -
 accuracy: 0.7155 - loss: 0.5085 - val_accuracy: 0.7179 - val_loss: 0.5295
 Epoch 440/1000
 19/19 0s 14ms/step -
 accuracy: 0.7341 - loss: 0.5115 - val_accuracy: 0.7179 - val_loss: 0.5295
 Epoch 441/1000
 19/19 0s 11ms/step -

accuracy: 0.7054 - loss: 0.5447 - val_accuracy: 0.7179 - val_loss: 0.5297
 Epoch 442/1000
 19/19 0s 6ms/step -
 accuracy: 0.7353 - loss: 0.5189 - val_accuracy: 0.7179 - val_loss: 0.5294
 Epoch 443/1000
 19/19 0s 6ms/step -
 accuracy: 0.7162 - loss: 0.5161 - val_accuracy: 0.7265 - val_loss: 0.5291
 Epoch 444/1000
 19/19 0s 6ms/step -
 accuracy: 0.7546 - loss: 0.4839 - val_accuracy: 0.7265 - val_loss: 0.5290
 Epoch 445/1000
 19/19 0s 6ms/step -
 accuracy: 0.7071 - loss: 0.5220 - val_accuracy: 0.7265 - val_loss: 0.5289
 Epoch 446/1000
 19/19 0s 6ms/step -
 accuracy: 0.7119 - loss: 0.5552 - val_accuracy: 0.7265 - val_loss: 0.5289
 Epoch 447/1000
 19/19 0s 6ms/step -
 accuracy: 0.7574 - loss: 0.5011 - val_accuracy: 0.7265 - val_loss: 0.5286
 Epoch 448/1000
 19/19 0s 6ms/step -
 accuracy: 0.6879 - loss: 0.5580 - val_accuracy: 0.7265 - val_loss: 0.5287
 Epoch 449/1000
 19/19 0s 6ms/step -
 accuracy: 0.7275 - loss: 0.5056 - val_accuracy: 0.7265 - val_loss: 0.5288
 Epoch 450/1000
 19/19 0s 7ms/step -
 accuracy: 0.7455 - loss: 0.5093 - val_accuracy: 0.7265 - val_loss: 0.5285
 Epoch 451/1000
 19/19 0s 6ms/step -
 accuracy: 0.7184 - loss: 0.5305 - val_accuracy: 0.7265 - val_loss: 0.5286
 Epoch 452/1000
 19/19 0s 7ms/step -
 accuracy: 0.7247 - loss: 0.5263 - val_accuracy: 0.7265 - val_loss: 0.5286
 Epoch 453/1000
 19/19 0s 6ms/step -
 accuracy: 0.7233 - loss: 0.5278 - val_accuracy: 0.7265 - val_loss: 0.5284
 Epoch 454/1000
 19/19 0s 6ms/step -
 accuracy: 0.7087 - loss: 0.5302 - val_accuracy: 0.7265 - val_loss: 0.5284
 Epoch 455/1000
 19/19 0s 10ms/step -
 accuracy: 0.7230 - loss: 0.5299 - val_accuracy: 0.7265 - val_loss: 0.5283
 Epoch 456/1000
 19/19 0s 6ms/step -
 accuracy: 0.7209 - loss: 0.5169 - val_accuracy: 0.7265 - val_loss: 0.5283
 Epoch 457/1000
 19/19 0s 6ms/step -

```

accuracy: 0.7238 - loss: 0.5231 - val_accuracy: 0.7265 - val_loss: 0.5282
Epoch 458/1000
19/19          0s 6ms/step -
accuracy: 0.6865 - loss: 0.5561 - val_accuracy: 0.7265 - val_loss: 0.5282
Epoch 459/1000
19/19          0s 6ms/step -
accuracy: 0.7315 - loss: 0.5109 - val_accuracy: 0.7265 - val_loss: 0.5280
Epoch 460/1000
19/19          0s 6ms/step -
accuracy: 0.7396 - loss: 0.5083 - val_accuracy: 0.7265 - val_loss: 0.5279
Epoch 461/1000
19/19          0s 6ms/step -
accuracy: 0.7249 - loss: 0.5286 - val_accuracy: 0.7265 - val_loss: 0.5277
Epoch 462/1000
19/19          0s 6ms/step -
accuracy: 0.7124 - loss: 0.5468 - val_accuracy: 0.7265 - val_loss: 0.5278
Epoch 463/1000
19/19          0s 6ms/step -
accuracy: 0.7052 - loss: 0.5300 - val_accuracy: 0.7265 - val_loss: 0.5278
Epoch 464/1000
19/19          0s 6ms/step -
accuracy: 0.7354 - loss: 0.5193 - val_accuracy: 0.7265 - val_loss: 0.5278
Epoch 465/1000
19/19          0s 7ms/step -
accuracy: 0.6854 - loss: 0.5486 - val_accuracy: 0.7265 - val_loss: 0.5278
Epoch 466/1000
19/19          0s 6ms/step -
accuracy: 0.7079 - loss: 0.5239 - val_accuracy: 0.7265 - val_loss: 0.5278
Epoch 467/1000
19/19          0s 6ms/step -
accuracy: 0.7104 - loss: 0.5454 - val_accuracy: 0.7179 - val_loss: 0.5280
Epoch 468/1000
19/19          0s 5ms/step -
accuracy: 0.7101 - loss: 0.5302 - val_accuracy: 0.7179 - val_loss: 0.5279
Epoch 469/1000
19/19          0s 10ms/step -
accuracy: 0.7342 - loss: 0.5058 - val_accuracy: 0.7265 - val_loss: 0.5276
Epoch 470/1000
19/19          0s 6ms/step -
accuracy: 0.7234 - loss: 0.5321 - val_accuracy: 0.7179 - val_loss: 0.5277
Epoch 471/1000
19/19          0s 6ms/step -
accuracy: 0.7084 - loss: 0.5160 - val_accuracy: 0.7265 - val_loss: 0.5274
Epoch 472/1000
19/19          0s 6ms/step -
accuracy: 0.7172 - loss: 0.5330 - val_accuracy: 0.7265 - val_loss: 0.5274
Epoch 473/1000
19/19          0s 7ms/step -

```

```

accuracy: 0.7458 - loss: 0.4945 - val_accuracy: 0.7350 - val_loss: 0.5270
Epoch 474/1000
19/19          0s 6ms/step -
accuracy: 0.6998 - loss: 0.5345 - val_accuracy: 0.7265 - val_loss: 0.5271
Epoch 475/1000
19/19          0s 8ms/step -
accuracy: 0.7345 - loss: 0.5017 - val_accuracy: 0.7265 - val_loss: 0.5272
Epoch 476/1000
19/19          0s 12ms/step -
accuracy: 0.7063 - loss: 0.5147 - val_accuracy: 0.7265 - val_loss: 0.5271
Epoch 477/1000
19/19          0s 5ms/step -
accuracy: 0.7423 - loss: 0.5112 - val_accuracy: 0.7265 - val_loss: 0.5268
Epoch 478/1000
19/19          0s 5ms/step -
accuracy: 0.7454 - loss: 0.5031 - val_accuracy: 0.7350 - val_loss: 0.5267
Epoch 479/1000
19/19          0s 5ms/step -
accuracy: 0.7292 - loss: 0.5040 - val_accuracy: 0.7265 - val_loss: 0.5267
Epoch 480/1000
19/19          0s 6ms/step -
accuracy: 0.7110 - loss: 0.5359 - val_accuracy: 0.7265 - val_loss: 0.5268
Epoch 481/1000
19/19          0s 6ms/step -
accuracy: 0.7122 - loss: 0.5416 - val_accuracy: 0.7265 - val_loss: 0.5268
Epoch 482/1000
19/19          0s 6ms/step -
accuracy: 0.7106 - loss: 0.5160 - val_accuracy: 0.7265 - val_loss: 0.5267
Epoch 483/1000
19/19          0s 6ms/step -
accuracy: 0.7135 - loss: 0.5048 - val_accuracy: 0.7265 - val_loss: 0.5265
Epoch 484/1000
19/19          0s 6ms/step -
accuracy: 0.7190 - loss: 0.5098 - val_accuracy: 0.7265 - val_loss: 0.5265
Epoch 485/1000
19/19          0s 10ms/step -
accuracy: 0.6937 - loss: 0.5360 - val_accuracy: 0.7265 - val_loss: 0.5265
Epoch 486/1000
19/19          0s 7ms/step -
accuracy: 0.7045 - loss: 0.5167 - val_accuracy: 0.7265 - val_loss: 0.5264
Epoch 487/1000
19/19          0s 6ms/step -
accuracy: 0.7372 - loss: 0.5169 - val_accuracy: 0.7265 - val_loss: 0.5264
Epoch 488/1000
19/19          0s 6ms/step -
accuracy: 0.7506 - loss: 0.4864 - val_accuracy: 0.7265 - val_loss: 0.5263
Epoch 489/1000
19/19          0s 7ms/step -

```

accuracy: 0.7148 - loss: 0.5109 - val_accuracy: 0.7265 - val_loss: 0.5262
 Epoch 490/1000
 19/19 0s 6ms/step -
 accuracy: 0.7158 - loss: 0.5182 - val_accuracy: 0.7265 - val_loss: 0.5262
 Epoch 491/1000
 19/19 0s 6ms/step -
 accuracy: 0.7505 - loss: 0.4956 - val_accuracy: 0.7350 - val_loss: 0.5259
 Epoch 492/1000
 19/19 0s 6ms/step -
 accuracy: 0.7365 - loss: 0.4973 - val_accuracy: 0.7350 - val_loss: 0.5259
 Epoch 493/1000
 19/19 0s 7ms/step -
 accuracy: 0.7097 - loss: 0.5317 - val_accuracy: 0.7265 - val_loss: 0.5261
 Epoch 494/1000
 19/19 0s 9ms/step -
 accuracy: 0.7418 - loss: 0.4851 - val_accuracy: 0.7265 - val_loss: 0.5259
 Epoch 495/1000
 19/19 0s 6ms/step -
 accuracy: 0.7230 - loss: 0.5326 - val_accuracy: 0.7265 - val_loss: 0.5260
 Epoch 496/1000
 19/19 0s 6ms/step -
 accuracy: 0.7297 - loss: 0.5115 - val_accuracy: 0.7265 - val_loss: 0.5259
 Epoch 497/1000
 19/19 0s 6ms/step -
 accuracy: 0.7295 - loss: 0.5281 - val_accuracy: 0.7265 - val_loss: 0.5258
 Epoch 498/1000
 19/19 0s 6ms/step -
 accuracy: 0.7252 - loss: 0.5265 - val_accuracy: 0.7265 - val_loss: 0.5256
 Epoch 499/1000
 19/19 0s 9ms/step -
 accuracy: 0.7322 - loss: 0.5059 - val_accuracy: 0.7350 - val_loss: 0.5255
 Epoch 500/1000
 19/19 0s 7ms/step -
 accuracy: 0.6880 - loss: 0.5416 - val_accuracy: 0.7265 - val_loss: 0.5257
 Epoch 501/1000
 19/19 0s 6ms/step -
 accuracy: 0.7097 - loss: 0.5368 - val_accuracy: 0.7265 - val_loss: 0.5258
 Epoch 502/1000
 19/19 0s 6ms/step -
 accuracy: 0.7378 - loss: 0.5228 - val_accuracy: 0.7265 - val_loss: 0.5256
 Epoch 503/1000
 19/19 0s 6ms/step -
 accuracy: 0.7475 - loss: 0.5035 - val_accuracy: 0.7265 - val_loss: 0.5257
 Epoch 504/1000
 19/19 0s 8ms/step -
 accuracy: 0.7118 - loss: 0.5122 - val_accuracy: 0.7265 - val_loss: 0.5255
 Epoch 505/1000
 19/19 0s 6ms/step -

accuracy: 0.7181 - loss: 0.5113 - val_accuracy: 0.7265 - val_loss: 0.5254
 Epoch 506/1000
 19/19 0s 6ms/step -
 accuracy: 0.7338 - loss: 0.5077 - val_accuracy: 0.7265 - val_loss: 0.5252
 Epoch 507/1000
 19/19 0s 6ms/step -
 accuracy: 0.7096 - loss: 0.5230 - val_accuracy: 0.7350 - val_loss: 0.5251
 Epoch 508/1000
 19/19 0s 6ms/step -
 accuracy: 0.7343 - loss: 0.5052 - val_accuracy: 0.7350 - val_loss: 0.5250
 Epoch 509/1000
 19/19 0s 9ms/step -
 accuracy: 0.7211 - loss: 0.5075 - val_accuracy: 0.7350 - val_loss: 0.5248
 Epoch 510/1000
 19/19 0s 6ms/step -
 accuracy: 0.7443 - loss: 0.5077 - val_accuracy: 0.7350 - val_loss: 0.5248
 Epoch 511/1000
 19/19 0s 6ms/step -
 accuracy: 0.7005 - loss: 0.5360 - val_accuracy: 0.7265 - val_loss: 0.5249
 Epoch 512/1000
 19/19 0s 6ms/step -
 accuracy: 0.6994 - loss: 0.5362 - val_accuracy: 0.7265 - val_loss: 0.5249
 Epoch 513/1000
 19/19 0s 9ms/step -
 accuracy: 0.6954 - loss: 0.5332 - val_accuracy: 0.7265 - val_loss: 0.5249
 Epoch 514/1000
 19/19 0s 9ms/step -
 accuracy: 0.7073 - loss: 0.5344 - val_accuracy: 0.7350 - val_loss: 0.5246
 Epoch 515/1000
 19/19 0s 5ms/step -
 accuracy: 0.7150 - loss: 0.5098 - val_accuracy: 0.7350 - val_loss: 0.5246
 Epoch 516/1000
 19/19 0s 5ms/step -
 accuracy: 0.7479 - loss: 0.4892 - val_accuracy: 0.7436 - val_loss: 0.5242
 Epoch 517/1000
 19/19 0s 5ms/step -
 accuracy: 0.7163 - loss: 0.5195 - val_accuracy: 0.7350 - val_loss: 0.5243
 Epoch 518/1000
 19/19 0s 4ms/step -
 accuracy: 0.7395 - loss: 0.5009 - val_accuracy: 0.7350 - val_loss: 0.5242
 Epoch 519/1000
 19/19 0s 4ms/step -
 accuracy: 0.7275 - loss: 0.5133 - val_accuracy: 0.7350 - val_loss: 0.5243
 Epoch 520/1000
 19/19 0s 5ms/step -
 accuracy: 0.7226 - loss: 0.5031 - val_accuracy: 0.7436 - val_loss: 0.5239
 Epoch 521/1000
 19/19 0s 6ms/step -

accuracy: 0.7190 - loss: 0.5285 - val_accuracy: 0.7350 - val_loss: 0.5241
 Epoch 522/1000
 19/19 0s 4ms/step -
 accuracy: 0.7407 - loss: 0.5084 - val_accuracy: 0.7350 - val_loss: 0.5242
 Epoch 523/1000
 19/19 0s 5ms/step -
 accuracy: 0.7346 - loss: 0.5179 - val_accuracy: 0.7350 - val_loss: 0.5241
 Epoch 524/1000
 19/19 0s 4ms/step -
 accuracy: 0.7502 - loss: 0.5004 - val_accuracy: 0.7350 - val_loss: 0.5239
 Epoch 525/1000
 19/19 0s 5ms/step -
 accuracy: 0.7182 - loss: 0.5225 - val_accuracy: 0.7350 - val_loss: 0.5240
 Epoch 526/1000
 19/19 0s 6ms/step -
 accuracy: 0.7130 - loss: 0.5377 - val_accuracy: 0.7265 - val_loss: 0.5242
 Epoch 527/1000
 19/19 0s 6ms/step -
 accuracy: 0.6908 - loss: 0.5352 - val_accuracy: 0.7265 - val_loss: 0.5242
 Epoch 528/1000
 19/19 0s 6ms/step -
 accuracy: 0.7043 - loss: 0.5412 - val_accuracy: 0.7265 - val_loss: 0.5239
 Epoch 529/1000
 19/19 0s 6ms/step -
 accuracy: 0.7294 - loss: 0.5012 - val_accuracy: 0.7265 - val_loss: 0.5240
 Epoch 530/1000
 19/19 0s 7ms/step -
 accuracy: 0.6977 - loss: 0.5352 - val_accuracy: 0.7265 - val_loss: 0.5239
 Epoch 531/1000
 19/19 0s 6ms/step -
 accuracy: 0.6973 - loss: 0.5289 - val_accuracy: 0.7265 - val_loss: 0.5242
 Epoch 532/1000
 19/19 0s 8ms/step -
 accuracy: 0.7153 - loss: 0.5277 - val_accuracy: 0.7265 - val_loss: 0.5238
 Epoch 533/1000
 19/19 0s 5ms/step -
 accuracy: 0.7425 - loss: 0.4977 - val_accuracy: 0.7265 - val_loss: 0.5237
 Epoch 534/1000
 19/19 0s 5ms/step -
 accuracy: 0.7404 - loss: 0.4982 - val_accuracy: 0.7350 - val_loss: 0.5234
 Epoch 535/1000
 19/19 0s 5ms/step -
 accuracy: 0.7048 - loss: 0.5311 - val_accuracy: 0.7350 - val_loss: 0.5235
 Epoch 536/1000
 19/19 0s 5ms/step -
 accuracy: 0.6936 - loss: 0.5563 - val_accuracy: 0.7350 - val_loss: 0.5234
 Epoch 537/1000
 19/19 0s 5ms/step -

```

accuracy: 0.6983 - loss: 0.5350 - val_accuracy: 0.7265 - val_loss: 0.5236
Epoch 538/1000
19/19          0s 5ms/step -
accuracy: 0.7480 - loss: 0.4986 - val_accuracy: 0.7350 - val_loss: 0.5233
Epoch 539/1000
19/19          0s 6ms/step -
accuracy: 0.7069 - loss: 0.5203 - val_accuracy: 0.7265 - val_loss: 0.5233
Epoch 540/1000
19/19          0s 5ms/step -
accuracy: 0.6921 - loss: 0.5325 - val_accuracy: 0.7265 - val_loss: 0.5234
Epoch 541/1000
19/19          0s 5ms/step -
accuracy: 0.6801 - loss: 0.5352 - val_accuracy: 0.7265 - val_loss: 0.5233
Epoch 542/1000
19/19          0s 5ms/step -
accuracy: 0.7037 - loss: 0.5264 - val_accuracy: 0.7265 - val_loss: 0.5233
Epoch 543/1000
19/19          0s 5ms/step -
accuracy: 0.7191 - loss: 0.5220 - val_accuracy: 0.7350 - val_loss: 0.5230
Epoch 544/1000
19/19          0s 5ms/step -
accuracy: 0.7055 - loss: 0.5287 - val_accuracy: 0.7350 - val_loss: 0.5231
Epoch 545/1000
19/19          0s 4ms/step -
accuracy: 0.7377 - loss: 0.5089 - val_accuracy: 0.7350 - val_loss: 0.5230
Epoch 546/1000
19/19          0s 5ms/step -
accuracy: 0.6905 - loss: 0.5497 - val_accuracy: 0.7265 - val_loss: 0.5232
Epoch 547/1000
19/19          0s 5ms/step -
accuracy: 0.7241 - loss: 0.5155 - val_accuracy: 0.7350 - val_loss: 0.5229
Epoch 548/1000
19/19          0s 5ms/step -
accuracy: 0.7159 - loss: 0.5096 - val_accuracy: 0.7265 - val_loss: 0.5229
Epoch 549/1000
19/19          0s 5ms/step -
accuracy: 0.7185 - loss: 0.5136 - val_accuracy: 0.7350 - val_loss: 0.5228
Epoch 550/1000
19/19          0s 5ms/step -
accuracy: 0.7374 - loss: 0.5155 - val_accuracy: 0.7350 - val_loss: 0.5227
Epoch 551/1000
19/19          0s 5ms/step -
accuracy: 0.7220 - loss: 0.5223 - val_accuracy: 0.7350 - val_loss: 0.5226
Epoch 552/1000
19/19          0s 5ms/step -
accuracy: 0.7515 - loss: 0.5084 - val_accuracy: 0.7350 - val_loss: 0.5224
Epoch 553/1000
19/19          0s 5ms/step -

```

accuracy: 0.7085 - loss: 0.5255 - val_accuracy: 0.7350 - val_loss: 0.5224
 Epoch 554/1000
 19/19 0s 4ms/step -
 accuracy: 0.7211 - loss: 0.5213 - val_accuracy: 0.7350 - val_loss: 0.5225
 Epoch 555/1000
 19/19 0s 5ms/step -
 accuracy: 0.7193 - loss: 0.5100 - val_accuracy: 0.7350 - val_loss: 0.5225
 Epoch 556/1000
 19/19 0s 5ms/step -
 accuracy: 0.7424 - loss: 0.4951 - val_accuracy: 0.7350 - val_loss: 0.5222
 Epoch 557/1000
 19/19 0s 5ms/step -
 accuracy: 0.7076 - loss: 0.5208 - val_accuracy: 0.7265 - val_loss: 0.5227
 Epoch 558/1000
 19/19 0s 5ms/step -
 accuracy: 0.7251 - loss: 0.5261 - val_accuracy: 0.7265 - val_loss: 0.5225
 Epoch 559/1000
 19/19 0s 6ms/step -
 accuracy: 0.7250 - loss: 0.5029 - val_accuracy: 0.7265 - val_loss: 0.5225
 Epoch 560/1000
 19/19 0s 9ms/step -
 accuracy: 0.7057 - loss: 0.5306 - val_accuracy: 0.7265 - val_loss: 0.5224
 Epoch 561/1000
 19/19 0s 6ms/step -
 accuracy: 0.7138 - loss: 0.5016 - val_accuracy: 0.7350 - val_loss: 0.5222
 Epoch 562/1000
 19/19 0s 6ms/step -
 accuracy: 0.7342 - loss: 0.5285 - val_accuracy: 0.7350 - val_loss: 0.5220
 Epoch 563/1000
 19/19 0s 7ms/step -
 accuracy: 0.7156 - loss: 0.5134 - val_accuracy: 0.7350 - val_loss: 0.5221
 Epoch 564/1000
 19/19 0s 7ms/step -
 accuracy: 0.6877 - loss: 0.5212 - val_accuracy: 0.7350 - val_loss: 0.5220
 Epoch 565/1000
 19/19 0s 6ms/step -
 accuracy: 0.7203 - loss: 0.5057 - val_accuracy: 0.7350 - val_loss: 0.5219
 Epoch 566/1000
 19/19 0s 5ms/step -
 accuracy: 0.7378 - loss: 0.4975 - val_accuracy: 0.7350 - val_loss: 0.5216
 Epoch 567/1000
 19/19 0s 6ms/step -
 accuracy: 0.6944 - loss: 0.5449 - val_accuracy: 0.7350 - val_loss: 0.5218
 Epoch 568/1000
 19/19 0s 6ms/step -
 accuracy: 0.7148 - loss: 0.5336 - val_accuracy: 0.7350 - val_loss: 0.5217
 Epoch 569/1000
 19/19 0s 7ms/step -

accuracy: 0.6894 - loss: 0.5514 - val_accuracy: 0.7265 - val_loss: 0.5221
 Epoch 570/1000
 19/19 0s 6ms/step -
 accuracy: 0.7050 - loss: 0.5532 - val_accuracy: 0.7350 - val_loss: 0.5219
 Epoch 571/1000
 19/19 0s 7ms/step -
 accuracy: 0.7210 - loss: 0.5346 - val_accuracy: 0.7350 - val_loss: 0.5216
 Epoch 572/1000
 19/19 0s 5ms/step -
 accuracy: 0.7198 - loss: 0.5100 - val_accuracy: 0.7350 - val_loss: 0.5215
 Epoch 573/1000
 19/19 0s 8ms/step -
 accuracy: 0.7074 - loss: 0.5082 - val_accuracy: 0.7350 - val_loss: 0.5216
 Epoch 574/1000
 19/19 0s 6ms/step -
 accuracy: 0.7511 - loss: 0.4785 - val_accuracy: 0.7350 - val_loss: 0.5213
 Epoch 575/1000
 19/19 0s 6ms/step -
 accuracy: 0.7265 - loss: 0.5264 - val_accuracy: 0.7350 - val_loss: 0.5215
 Epoch 576/1000
 19/19 0s 6ms/step -
 accuracy: 0.7247 - loss: 0.5168 - val_accuracy: 0.7350 - val_loss: 0.5215
 Epoch 577/1000
 19/19 0s 6ms/step -
 accuracy: 0.6986 - loss: 0.5464 - val_accuracy: 0.7350 - val_loss: 0.5214
 Epoch 578/1000
 19/19 0s 10ms/step -
 accuracy: 0.7340 - loss: 0.5016 - val_accuracy: 0.7350 - val_loss: 0.5211
 Epoch 579/1000
 19/19 0s 10ms/step -
 accuracy: 0.7176 - loss: 0.5158 - val_accuracy: 0.7350 - val_loss: 0.5211
 Epoch 580/1000
 19/19 0s 6ms/step -
 accuracy: 0.7265 - loss: 0.5292 - val_accuracy: 0.7350 - val_loss: 0.5212
 Epoch 581/1000
 19/19 0s 6ms/step -
 accuracy: 0.7195 - loss: 0.5158 - val_accuracy: 0.7350 - val_loss: 0.5213
 Epoch 582/1000
 19/19 0s 9ms/step -
 accuracy: 0.7290 - loss: 0.5039 - val_accuracy: 0.7350 - val_loss: 0.5210
 Epoch 583/1000
 19/19 0s 6ms/step -
 accuracy: 0.7290 - loss: 0.5051 - val_accuracy: 0.7436 - val_loss: 0.5208
 Epoch 584/1000
 19/19 0s 6ms/step -
 accuracy: 0.7180 - loss: 0.5278 - val_accuracy: 0.7350 - val_loss: 0.5209
 Epoch 585/1000
 19/19 0s 7ms/step -

accuracy: 0.7431 - loss: 0.4940 - val_accuracy: 0.7521 - val_loss: 0.5206
 Epoch 586/1000
 19/19 0s 13ms/step -
 accuracy: 0.7267 - loss: 0.5118 - val_accuracy: 0.7350 - val_loss: 0.5208
 Epoch 587/1000
 19/19 0s 6ms/step -
 accuracy: 0.7356 - loss: 0.5091 - val_accuracy: 0.7350 - val_loss: 0.5208
 Epoch 588/1000
 19/19 0s 5ms/step -
 accuracy: 0.7392 - loss: 0.4975 - val_accuracy: 0.7350 - val_loss: 0.5206
 Epoch 589/1000
 19/19 0s 6ms/step -
 accuracy: 0.7418 - loss: 0.5117 - val_accuracy: 0.7521 - val_loss: 0.5204
 Epoch 590/1000
 19/19 0s 9ms/step -
 accuracy: 0.7397 - loss: 0.5151 - val_accuracy: 0.7350 - val_loss: 0.5206
 Epoch 591/1000
 19/19 0s 5ms/step -
 accuracy: 0.7238 - loss: 0.4950 - val_accuracy: 0.7350 - val_loss: 0.5207
 Epoch 592/1000
 19/19 0s 5ms/step -
 accuracy: 0.7102 - loss: 0.5505 - val_accuracy: 0.7350 - val_loss: 0.5206
 Epoch 593/1000
 19/19 0s 4ms/step -
 accuracy: 0.7196 - loss: 0.5199 - val_accuracy: 0.7350 - val_loss: 0.5206
 Epoch 594/1000
 19/19 0s 5ms/step -
 accuracy: 0.7381 - loss: 0.4971 - val_accuracy: 0.7350 - val_loss: 0.5206
 Epoch 595/1000
 19/19 0s 4ms/step -
 accuracy: 0.6965 - loss: 0.5279 - val_accuracy: 0.7350 - val_loss: 0.5205
 Epoch 596/1000
 19/19 0s 5ms/step -
 accuracy: 0.7037 - loss: 0.5217 - val_accuracy: 0.7350 - val_loss: 0.5204
 Epoch 597/1000
 19/19 0s 5ms/step -
 accuracy: 0.7036 - loss: 0.5198 - val_accuracy: 0.7350 - val_loss: 0.5205
 Epoch 598/1000
 19/19 0s 4ms/step -
 accuracy: 0.7221 - loss: 0.5144 - val_accuracy: 0.7436 - val_loss: 0.5201
 Epoch 599/1000
 19/19 0s 5ms/step -
 accuracy: 0.7421 - loss: 0.5145 - val_accuracy: 0.7436 - val_loss: 0.5200
 Epoch 600/1000
 19/19 0s 5ms/step -
 accuracy: 0.7217 - loss: 0.5277 - val_accuracy: 0.7521 - val_loss: 0.5198
 Epoch 601/1000
 19/19 0s 5ms/step -

accuracy: 0.7104 - loss: 0.5166 - val_accuracy: 0.7521 - val_loss: 0.5198
 Epoch 602/1000
 19/19 0s 4ms/step -
 accuracy: 0.7342 - loss: 0.5125 - val_accuracy: 0.7436 - val_loss: 0.5199
 Epoch 603/1000
 19/19 0s 5ms/step -
 accuracy: 0.7261 - loss: 0.4971 - val_accuracy: 0.7521 - val_loss: 0.5197
 Epoch 604/1000
 19/19 0s 5ms/step -
 accuracy: 0.7426 - loss: 0.5081 - val_accuracy: 0.7521 - val_loss: 0.5196
 Epoch 605/1000
 19/19 0s 4ms/step -
 accuracy: 0.7572 - loss: 0.4886 - val_accuracy: 0.7521 - val_loss: 0.5196
 Epoch 606/1000
 19/19 0s 5ms/step -
 accuracy: 0.7427 - loss: 0.5058 - val_accuracy: 0.7521 - val_loss: 0.5196
 Epoch 607/1000
 19/19 0s 4ms/step -
 accuracy: 0.7443 - loss: 0.4775 - val_accuracy: 0.7521 - val_loss: 0.5194
 Epoch 608/1000
 19/19 0s 6ms/step -
 accuracy: 0.7261 - loss: 0.5190 - val_accuracy: 0.7436 - val_loss: 0.5196
 Epoch 609/1000
 19/19 0s 6ms/step -
 accuracy: 0.7071 - loss: 0.5372 - val_accuracy: 0.7350 - val_loss: 0.5200
 Epoch 610/1000
 19/19 0s 6ms/step -
 accuracy: 0.7277 - loss: 0.4982 - val_accuracy: 0.7436 - val_loss: 0.5195
 Epoch 611/1000
 19/19 0s 5ms/step -
 accuracy: 0.7261 - loss: 0.5125 - val_accuracy: 0.7436 - val_loss: 0.5195
 Epoch 612/1000
 19/19 0s 7ms/step -
 accuracy: 0.7044 - loss: 0.5288 - val_accuracy: 0.7436 - val_loss: 0.5196
 Epoch 613/1000
 19/19 0s 5ms/step -
 accuracy: 0.7270 - loss: 0.5130 - val_accuracy: 0.7350 - val_loss: 0.5196
 Epoch 614/1000
 19/19 0s 5ms/step -
 accuracy: 0.7350 - loss: 0.5006 - val_accuracy: 0.7436 - val_loss: 0.5195
 Epoch 615/1000
 19/19 0s 5ms/step -
 accuracy: 0.7213 - loss: 0.5080 - val_accuracy: 0.7350 - val_loss: 0.5197
 Epoch 616/1000
 19/19 0s 5ms/step -
 accuracy: 0.7354 - loss: 0.5003 - val_accuracy: 0.7521 - val_loss: 0.5192
 Epoch 617/1000
 19/19 0s 8ms/step -

accuracy: 0.7371 - loss: 0.5038 - val_accuracy: 0.7436 - val_loss: 0.5193
 Epoch 618/1000
 19/19 0s 10ms/step -
 accuracy: 0.7474 - loss: 0.4868 - val_accuracy: 0.7436 - val_loss: 0.5192
 Epoch 619/1000
 19/19 0s 5ms/step -
 accuracy: 0.7236 - loss: 0.5342 - val_accuracy: 0.7521 - val_loss: 0.5191
 Epoch 620/1000
 19/19 0s 5ms/step -
 accuracy: 0.7367 - loss: 0.4999 - val_accuracy: 0.7436 - val_loss: 0.5190
 Epoch 621/1000
 19/19 0s 5ms/step -
 accuracy: 0.7135 - loss: 0.5385 - val_accuracy: 0.7350 - val_loss: 0.5194
 Epoch 622/1000
 19/19 0s 5ms/step -
 accuracy: 0.7127 - loss: 0.5289 - val_accuracy: 0.7350 - val_loss: 0.5195
 Epoch 623/1000
 19/19 0s 5ms/step -
 accuracy: 0.7121 - loss: 0.5136 - val_accuracy: 0.7436 - val_loss: 0.5191
 Epoch 624/1000
 19/19 0s 5ms/step -
 accuracy: 0.7116 - loss: 0.5232 - val_accuracy: 0.7436 - val_loss: 0.5190
 Epoch 625/1000
 19/19 0s 5ms/step -
 accuracy: 0.7325 - loss: 0.5018 - val_accuracy: 0.7436 - val_loss: 0.5189
 Epoch 626/1000
 19/19 0s 5ms/step -
 accuracy: 0.7070 - loss: 0.5417 - val_accuracy: 0.7350 - val_loss: 0.5191
 Epoch 627/1000
 19/19 0s 5ms/step -
 accuracy: 0.7328 - loss: 0.4946 - val_accuracy: 0.7436 - val_loss: 0.5189
 Epoch 628/1000
 19/19 0s 5ms/step -
 accuracy: 0.7321 - loss: 0.5205 - val_accuracy: 0.7436 - val_loss: 0.5189
 Epoch 629/1000
 19/19 0s 5ms/step -
 accuracy: 0.7265 - loss: 0.5248 - val_accuracy: 0.7436 - val_loss: 0.5187
 Epoch 630/1000
 19/19 0s 5ms/step -
 accuracy: 0.7179 - loss: 0.5199 - val_accuracy: 0.7350 - val_loss: 0.5188
 Epoch 631/1000
 19/19 0s 5ms/step -
 accuracy: 0.6987 - loss: 0.5392 - val_accuracy: 0.7350 - val_loss: 0.5188
 Epoch 632/1000
 19/19 0s 7ms/step -
 accuracy: 0.7105 - loss: 0.5187 - val_accuracy: 0.7350 - val_loss: 0.5189
 Epoch 633/1000
 19/19 0s 5ms/step -

accuracy: 0.7425 - loss: 0.4837 - val_accuracy: 0.7436 - val_loss: 0.5185
 Epoch 634/1000
 19/19 0s 5ms/step -
 accuracy: 0.7113 - loss: 0.5440 - val_accuracy: 0.7350 - val_loss: 0.5189
 Epoch 635/1000
 19/19 0s 5ms/step -
 accuracy: 0.7235 - loss: 0.5133 - val_accuracy: 0.7350 - val_loss: 0.5187
 Epoch 636/1000
 19/19 0s 5ms/step -
 accuracy: 0.6912 - loss: 0.5380 - val_accuracy: 0.7350 - val_loss: 0.5186
 Epoch 637/1000
 19/19 0s 5ms/step -
 accuracy: 0.7018 - loss: 0.5105 - val_accuracy: 0.7350 - val_loss: 0.5187
 Epoch 638/1000
 19/19 0s 5ms/step -
 accuracy: 0.7010 - loss: 0.5349 - val_accuracy: 0.7350 - val_loss: 0.5187
 Epoch 639/1000
 19/19 0s 8ms/step -
 accuracy: 0.7265 - loss: 0.4887 - val_accuracy: 0.7436 - val_loss: 0.5183
 Epoch 640/1000
 19/19 0s 7ms/step -
 accuracy: 0.7296 - loss: 0.5309 - val_accuracy: 0.7436 - val_loss: 0.5182
 Epoch 641/1000
 19/19 0s 7ms/step -
 accuracy: 0.7286 - loss: 0.5031 - val_accuracy: 0.7436 - val_loss: 0.5181
 Epoch 642/1000
 19/19 0s 5ms/step -
 accuracy: 0.7519 - loss: 0.5398 - val_accuracy: 0.7436 - val_loss: 0.5180
 Epoch 643/1000
 19/19 0s 5ms/step -
 accuracy: 0.7340 - loss: 0.5154 - val_accuracy: 0.7350 - val_loss: 0.5184
 Epoch 644/1000
 19/19 0s 4ms/step -
 accuracy: 0.7168 - loss: 0.5365 - val_accuracy: 0.7350 - val_loss: 0.5183
 Epoch 645/1000
 19/19 0s 5ms/step -
 accuracy: 0.7582 - loss: 0.4944 - val_accuracy: 0.7436 - val_loss: 0.5179
 Epoch 646/1000
 19/19 0s 5ms/step -
 accuracy: 0.7304 - loss: 0.5358 - val_accuracy: 0.7436 - val_loss: 0.5179
 Epoch 647/1000
 19/19 0s 4ms/step -
 accuracy: 0.7231 - loss: 0.5100 - val_accuracy: 0.7436 - val_loss: 0.5179
 Epoch 648/1000
 19/19 0s 4ms/step -
 accuracy: 0.7260 - loss: 0.5065 - val_accuracy: 0.7521 - val_loss: 0.5177
 Epoch 649/1000
 19/19 0s 4ms/step -

accuracy: 0.7514 - loss: 0.5081 - val_accuracy: 0.7521 - val_loss: 0.5176
 Epoch 650/1000
 19/19 0s 7ms/step -
 accuracy: 0.7168 - loss: 0.5313 - val_accuracy: 0.7521 - val_loss: 0.5176
 Epoch 651/1000
 19/19 0s 6ms/step -
 accuracy: 0.7293 - loss: 0.5078 - val_accuracy: 0.7436 - val_loss: 0.5179
 Epoch 652/1000
 19/19 0s 5ms/step -
 accuracy: 0.7280 - loss: 0.5232 - val_accuracy: 0.7436 - val_loss: 0.5179
 Epoch 653/1000
 19/19 0s 5ms/step -
 accuracy: 0.7346 - loss: 0.4956 - val_accuracy: 0.7436 - val_loss: 0.5177
 Epoch 654/1000
 19/19 0s 4ms/step -
 accuracy: 0.7467 - loss: 0.4925 - val_accuracy: 0.7436 - val_loss: 0.5177
 Epoch 655/1000
 19/19 0s 8ms/step -
 accuracy: 0.7544 - loss: 0.4782 - val_accuracy: 0.7521 - val_loss: 0.5173
 Epoch 656/1000
 19/19 0s 5ms/step -
 accuracy: 0.7205 - loss: 0.5198 - val_accuracy: 0.7521 - val_loss: 0.5174
 Epoch 657/1000
 19/19 0s 5ms/step -
 accuracy: 0.7301 - loss: 0.5046 - val_accuracy: 0.7436 - val_loss: 0.5174
 Epoch 658/1000
 19/19 0s 5ms/step -
 accuracy: 0.7137 - loss: 0.5283 - val_accuracy: 0.7436 - val_loss: 0.5177
 Epoch 659/1000
 19/19 0s 6ms/step -
 accuracy: 0.7202 - loss: 0.5228 - val_accuracy: 0.7350 - val_loss: 0.5178
 Epoch 660/1000
 19/19 0s 6ms/step -
 accuracy: 0.7182 - loss: 0.5015 - val_accuracy: 0.7350 - val_loss: 0.5178
 Epoch 661/1000
 19/19 0s 5ms/step -
 accuracy: 0.7276 - loss: 0.4958 - val_accuracy: 0.7350 - val_loss: 0.5178
 Epoch 662/1000
 19/19 0s 5ms/step -
 accuracy: 0.7311 - loss: 0.5212 - val_accuracy: 0.7350 - val_loss: 0.5179
 Epoch 663/1000
 19/19 0s 5ms/step -
 accuracy: 0.7097 - loss: 0.5201 - val_accuracy: 0.7436 - val_loss: 0.5175
 Epoch 664/1000
 19/19 0s 5ms/step -
 accuracy: 0.7452 - loss: 0.5032 - val_accuracy: 0.7436 - val_loss: 0.5174
 Epoch 665/1000
 19/19 0s 5ms/step -

accuracy: 0.6972 - loss: 0.5444 - val_accuracy: 0.7350 - val_loss: 0.5176
 Epoch 666/1000
 19/19 0s 7ms/step -
 accuracy: 0.7382 - loss: 0.5018 - val_accuracy: 0.7436 - val_loss: 0.5173
 Epoch 667/1000
 19/19 0s 4ms/step -
 accuracy: 0.7211 - loss: 0.5094 - val_accuracy: 0.7436 - val_loss: 0.5172
 Epoch 668/1000
 19/19 0s 5ms/step -
 accuracy: 0.7101 - loss: 0.5145 - val_accuracy: 0.7436 - val_loss: 0.5171
 Epoch 669/1000
 19/19 0s 5ms/step -
 accuracy: 0.7341 - loss: 0.5042 - val_accuracy: 0.7436 - val_loss: 0.5170
 Epoch 670/1000
 19/19 0s 5ms/step -
 accuracy: 0.7138 - loss: 0.5094 - val_accuracy: 0.7436 - val_loss: 0.5169
 Epoch 671/1000
 19/19 0s 5ms/step -
 accuracy: 0.7317 - loss: 0.5045 - val_accuracy: 0.7436 - val_loss: 0.5168
 Epoch 672/1000
 19/19 0s 5ms/step -
 accuracy: 0.7006 - loss: 0.5303 - val_accuracy: 0.7436 - val_loss: 0.5169
 Epoch 673/1000
 19/19 0s 6ms/step -
 accuracy: 0.7347 - loss: 0.5197 - val_accuracy: 0.7436 - val_loss: 0.5172
 Epoch 674/1000
 19/19 0s 5ms/step -
 accuracy: 0.7282 - loss: 0.5014 - val_accuracy: 0.7436 - val_loss: 0.5169
 Epoch 675/1000
 19/19 0s 6ms/step -
 accuracy: 0.7436 - loss: 0.4993 - val_accuracy: 0.7436 - val_loss: 0.5167
 Epoch 676/1000
 19/19 0s 7ms/step -
 accuracy: 0.7215 - loss: 0.5153 - val_accuracy: 0.7436 - val_loss: 0.5168
 Epoch 677/1000
 19/19 0s 5ms/step -
 accuracy: 0.7491 - loss: 0.4963 - val_accuracy: 0.7521 - val_loss: 0.5165
 Epoch 678/1000
 19/19 0s 5ms/step -
 accuracy: 0.7051 - loss: 0.5280 - val_accuracy: 0.7436 - val_loss: 0.5166
 Epoch 679/1000
 19/19 0s 5ms/step -
 accuracy: 0.7252 - loss: 0.5114 - val_accuracy: 0.7436 - val_loss: 0.5167
 Epoch 680/1000
 19/19 0s 5ms/step -
 accuracy: 0.7204 - loss: 0.5187 - val_accuracy: 0.7436 - val_loss: 0.5168
 Epoch 681/1000
 19/19 0s 5ms/step -

```

accuracy: 0.7463 - loss: 0.4960 - val_accuracy: 0.7436 - val_loss: 0.5166
Epoch 682/1000
19/19          0s 5ms/step -
accuracy: 0.7091 - loss: 0.5204 - val_accuracy: 0.7436 - val_loss: 0.5166
Epoch 683/1000
19/19          0s 6ms/step -
accuracy: 0.7517 - loss: 0.5009 - val_accuracy: 0.7521 - val_loss: 0.5163
Epoch 684/1000
19/19          0s 8ms/step -
accuracy: 0.6971 - loss: 0.5320 - val_accuracy: 0.7436 - val_loss: 0.5166
Epoch 685/1000
19/19          0s 18ms/step -
accuracy: 0.7134 - loss: 0.5347 - val_accuracy: 0.7436 - val_loss: 0.5168
Epoch 686/1000
19/19          0s 8ms/step -
accuracy: 0.7192 - loss: 0.5261 - val_accuracy: 0.7436 - val_loss: 0.5165
Epoch 687/1000
19/19          0s 7ms/step -
accuracy: 0.7419 - loss: 0.4997 - val_accuracy: 0.7436 - val_loss: 0.5164
Epoch 688/1000
19/19          0s 7ms/step -
accuracy: 0.7147 - loss: 0.5157 - val_accuracy: 0.7350 - val_loss: 0.5168
Epoch 689/1000
19/19          0s 6ms/step -
accuracy: 0.6856 - loss: 0.5512 - val_accuracy: 0.7350 - val_loss: 0.5168
Epoch 690/1000
19/19          0s 7ms/step -
accuracy: 0.7250 - loss: 0.4864 - val_accuracy: 0.7350 - val_loss: 0.5168
Epoch 691/1000
19/19          0s 8ms/step -
accuracy: 0.7324 - loss: 0.5163 - val_accuracy: 0.7436 - val_loss: 0.5166
Epoch 692/1000
19/19          0s 7ms/step -
accuracy: 0.7152 - loss: 0.5015 - val_accuracy: 0.7436 - val_loss: 0.5163
Epoch 693/1000
19/19          0s 6ms/step -
accuracy: 0.7065 - loss: 0.5059 - val_accuracy: 0.7436 - val_loss: 0.5164
Epoch 694/1000
19/19          0s 6ms/step -
accuracy: 0.7323 - loss: 0.5057 - val_accuracy: 0.7350 - val_loss: 0.5165
Epoch 695/1000
19/19          0s 5ms/step -
accuracy: 0.7182 - loss: 0.5368 - val_accuracy: 0.7436 - val_loss: 0.5164
Epoch 696/1000
19/19          0s 6ms/step -
accuracy: 0.7029 - loss: 0.5060 - val_accuracy: 0.7350 - val_loss: 0.5165
Epoch 697/1000
19/19          0s 5ms/step -

```


accuracy: 0.7471 - loss: 0.5053 - val_accuracy: 0.7436 - val_loss: 0.5160
 Epoch 698/1000
 19/19 0s 5ms/step -
 accuracy: 0.7217 - loss: 0.5101 - val_accuracy: 0.7436 - val_loss: 0.5161
 Epoch 699/1000
 19/19 0s 5ms/step -
 accuracy: 0.7392 - loss: 0.5078 - val_accuracy: 0.7436 - val_loss: 0.5160
 Epoch 700/1000
 19/19 0s 4ms/step -
 accuracy: 0.7250 - loss: 0.5084 - val_accuracy: 0.7436 - val_loss: 0.5161
 Epoch 701/1000
 19/19 0s 5ms/step -
 accuracy: 0.6926 - loss: 0.5438 - val_accuracy: 0.7436 - val_loss: 0.5159
 Epoch 702/1000
 19/19 0s 5ms/step -
 accuracy: 0.6996 - loss: 0.5310 - val_accuracy: 0.7436 - val_loss: 0.5159
 Epoch 703/1000
 19/19 0s 4ms/step -
 accuracy: 0.7254 - loss: 0.4989 - val_accuracy: 0.7436 - val_loss: 0.5157
 Epoch 704/1000
 19/19 0s 5ms/step -
 accuracy: 0.7274 - loss: 0.5223 - val_accuracy: 0.7436 - val_loss: 0.5157
 Epoch 705/1000
 19/19 0s 5ms/step -
 accuracy: 0.7248 - loss: 0.5115 - val_accuracy: 0.7436 - val_loss: 0.5157
 Epoch 706/1000
 19/19 0s 8ms/step -
 accuracy: 0.7025 - loss: 0.5180 - val_accuracy: 0.7436 - val_loss: 0.5159
 Epoch 707/1000
 19/19 0s 5ms/step -
 accuracy: 0.7030 - loss: 0.5203 - val_accuracy: 0.7436 - val_loss: 0.5160
 Epoch 708/1000
 19/19 0s 5ms/step -
 accuracy: 0.7352 - loss: 0.5100 - val_accuracy: 0.7436 - val_loss: 0.5155
 Epoch 709/1000
 19/19 0s 5ms/step -
 accuracy: 0.7176 - loss: 0.5015 - val_accuracy: 0.7436 - val_loss: 0.5154
 Epoch 710/1000
 19/19 0s 5ms/step -
 accuracy: 0.7133 - loss: 0.5395 - val_accuracy: 0.7436 - val_loss: 0.5159
 Epoch 711/1000
 19/19 0s 5ms/step -
 accuracy: 0.7210 - loss: 0.4997 - val_accuracy: 0.7350 - val_loss: 0.5160
 Epoch 712/1000
 19/19 0s 11ms/step -
 accuracy: 0.7091 - loss: 0.5191 - val_accuracy: 0.7350 - val_loss: 0.5161
 Epoch 713/1000
 19/19 0s 6ms/step -

accuracy: 0.7157 - loss: 0.5195 - val_accuracy: 0.7350 - val_loss: 0.5161
 Epoch 714/1000
 19/19 0s 6ms/step -
 accuracy: 0.6985 - loss: 0.5340 - val_accuracy: 0.7350 - val_loss: 0.5159
 Epoch 715/1000
 19/19 0s 6ms/step -
 accuracy: 0.7093 - loss: 0.5160 - val_accuracy: 0.7436 - val_loss: 0.5157
 Epoch 716/1000
 19/19 0s 5ms/step -
 accuracy: 0.7249 - loss: 0.4946 - val_accuracy: 0.7436 - val_loss: 0.5155
 Epoch 717/1000
 19/19 0s 5ms/step -
 accuracy: 0.7138 - loss: 0.5413 - val_accuracy: 0.7436 - val_loss: 0.5152
 Epoch 718/1000
 19/19 0s 5ms/step -
 accuracy: 0.7362 - loss: 0.5301 - val_accuracy: 0.7436 - val_loss: 0.5151
 Epoch 719/1000
 19/19 0s 6ms/step -
 accuracy: 0.7302 - loss: 0.5205 - val_accuracy: 0.7436 - val_loss: 0.5151
 Epoch 720/1000
 19/19 0s 6ms/step -
 accuracy: 0.7233 - loss: 0.5167 - val_accuracy: 0.7436 - val_loss: 0.5153
 Epoch 721/1000
 19/19 0s 5ms/step -
 accuracy: 0.7158 - loss: 0.5063 - val_accuracy: 0.7436 - val_loss: 0.5152
 Epoch 722/1000
 19/19 0s 5ms/step -
 accuracy: 0.7432 - loss: 0.4889 - val_accuracy: 0.7521 - val_loss: 0.5149
 Epoch 723/1000
 19/19 0s 5ms/step -
 accuracy: 0.7189 - loss: 0.5221 - val_accuracy: 0.7436 - val_loss: 0.5151
 Epoch 724/1000
 19/19 0s 5ms/step -
 accuracy: 0.7166 - loss: 0.5132 - val_accuracy: 0.7436 - val_loss: 0.5151
 Epoch 725/1000
 19/19 0s 6ms/step -
 accuracy: 0.7304 - loss: 0.5050 - val_accuracy: 0.7436 - val_loss: 0.5151
 Epoch 726/1000
 19/19 0s 6ms/step -
 accuracy: 0.7030 - loss: 0.5286 - val_accuracy: 0.7350 - val_loss: 0.5155
 Epoch 727/1000
 19/19 0s 5ms/step -
 accuracy: 0.7002 - loss: 0.5229 - val_accuracy: 0.7350 - val_loss: 0.5155
 Epoch 728/1000
 19/19 0s 5ms/step -
 accuracy: 0.7330 - loss: 0.5166 - val_accuracy: 0.7436 - val_loss: 0.5150
 Epoch 729/1000
 19/19 0s 4ms/step -

```

accuracy: 0.6976 - loss: 0.5297 - val_accuracy: 0.7436 - val_loss: 0.5153
Epoch 730/1000
19/19          0s 6ms/step -
accuracy: 0.7041 - loss: 0.5321 - val_accuracy: 0.7436 - val_loss: 0.5153
Epoch 731/1000
19/19          0s 5ms/step -
accuracy: 0.7218 - loss: 0.5370 - val_accuracy: 0.7436 - val_loss: 0.5151
Epoch 732/1000
19/19          0s 7ms/step -
accuracy: 0.7380 - loss: 0.5047 - val_accuracy: 0.7436 - val_loss: 0.5147
Epoch 733/1000
19/19          0s 5ms/step -
accuracy: 0.7090 - loss: 0.5270 - val_accuracy: 0.7436 - val_loss: 0.5149
Epoch 734/1000
19/19          0s 5ms/step -
accuracy: 0.6939 - loss: 0.5192 - val_accuracy: 0.7436 - val_loss: 0.5150
Epoch 735/1000
19/19          0s 5ms/step -
accuracy: 0.7130 - loss: 0.5251 - val_accuracy: 0.7436 - val_loss: 0.5149
Epoch 736/1000
19/19          0s 4ms/step -
accuracy: 0.7260 - loss: 0.4989 - val_accuracy: 0.7436 - val_loss: 0.5147
Epoch 737/1000
19/19          0s 5ms/step -
accuracy: 0.6823 - loss: 0.5444 - val_accuracy: 0.7436 - val_loss: 0.5149
Epoch 738/1000
19/19          0s 6ms/step -
accuracy: 0.7065 - loss: 0.5219 - val_accuracy: 0.7436 - val_loss: 0.5149
Epoch 739/1000
19/19          0s 5ms/step -
accuracy: 0.7304 - loss: 0.5141 - val_accuracy: 0.7436 - val_loss: 0.5144
Epoch 740/1000
19/19          0s 5ms/step -
accuracy: 0.7172 - loss: 0.5026 - val_accuracy: 0.7436 - val_loss: 0.5148
Epoch 741/1000
19/19          0s 5ms/step -
accuracy: 0.6795 - loss: 0.5319 - val_accuracy: 0.7436 - val_loss: 0.5147
Epoch 742/1000
19/19          0s 5ms/step -
accuracy: 0.6974 - loss: 0.5356 - val_accuracy: 0.7436 - val_loss: 0.5147
Epoch 743/1000
19/19          0s 5ms/step -
accuracy: 0.7285 - loss: 0.4916 - val_accuracy: 0.7436 - val_loss: 0.5144
Epoch 744/1000
19/19          0s 6ms/step -
accuracy: 0.7314 - loss: 0.4991 - val_accuracy: 0.7436 - val_loss: 0.5142
Epoch 745/1000
19/19          0s 5ms/step -

```

accuracy: 0.7323 - loss: 0.5364 - val_accuracy: 0.7436 - val_loss: 0.5143
 Epoch 746/1000
 19/19 0s 5ms/step -
 accuracy: 0.7016 - loss: 0.5404 - val_accuracy: 0.7436 - val_loss: 0.5144
 Epoch 747/1000
 19/19 0s 5ms/step -
 accuracy: 0.7077 - loss: 0.5106 - val_accuracy: 0.7436 - val_loss: 0.5142
 Epoch 748/1000
 19/19 0s 4ms/step -
 accuracy: 0.6909 - loss: 0.5441 - val_accuracy: 0.7436 - val_loss: 0.5144
 Epoch 749/1000
 19/19 0s 7ms/step -
 accuracy: 0.7363 - loss: 0.5005 - val_accuracy: 0.7436 - val_loss: 0.5142
 Epoch 750/1000
 19/19 0s 5ms/step -
 accuracy: 0.6995 - loss: 0.5165 - val_accuracy: 0.7436 - val_loss: 0.5140
 Epoch 751/1000
 19/19 0s 5ms/step -
 accuracy: 0.7088 - loss: 0.5342 - val_accuracy: 0.7436 - val_loss: 0.5140
 Epoch 752/1000
 19/19 0s 4ms/step -
 accuracy: 0.7355 - loss: 0.5028 - val_accuracy: 0.7436 - val_loss: 0.5141
 Epoch 753/1000
 19/19 0s 5ms/step -
 accuracy: 0.7284 - loss: 0.4942 - val_accuracy: 0.7436 - val_loss: 0.5141
 Epoch 754/1000
 19/19 0s 5ms/step -
 accuracy: 0.7282 - loss: 0.4937 - val_accuracy: 0.7436 - val_loss: 0.5139
 Epoch 755/1000
 19/19 0s 5ms/step -
 accuracy: 0.7482 - loss: 0.4859 - val_accuracy: 0.7521 - val_loss: 0.5137
 Epoch 756/1000
 19/19 0s 4ms/step -
 accuracy: 0.7176 - loss: 0.5164 - val_accuracy: 0.7436 - val_loss: 0.5141
 Epoch 757/1000
 19/19 0s 7ms/step -
 accuracy: 0.7234 - loss: 0.5200 - val_accuracy: 0.7436 - val_loss: 0.5140
 Epoch 758/1000
 19/19 0s 5ms/step -
 accuracy: 0.7111 - loss: 0.5385 - val_accuracy: 0.7436 - val_loss: 0.5142
 Epoch 759/1000
 19/19 0s 6ms/step -
 accuracy: 0.7142 - loss: 0.5032 - val_accuracy: 0.7436 - val_loss: 0.5141
 Epoch 760/1000
 19/19 0s 7ms/step -
 accuracy: 0.7094 - loss: 0.5262 - val_accuracy: 0.7436 - val_loss: 0.5142
 Epoch 761/1000
 19/19 0s 6ms/step -

accuracy: 0.7124 - loss: 0.5311 - val_accuracy: 0.7436 - val_loss: 0.5140
 Epoch 762/1000
 19/19 0s 5ms/step -
 accuracy: 0.7285 - loss: 0.5171 - val_accuracy: 0.7436 - val_loss: 0.5141
 Epoch 763/1000
 19/19 0s 5ms/step -
 accuracy: 0.7104 - loss: 0.5062 - val_accuracy: 0.7436 - val_loss: 0.5136
 Epoch 764/1000
 19/19 0s 5ms/step -
 accuracy: 0.7360 - loss: 0.4953 - val_accuracy: 0.7436 - val_loss: 0.5135
 Epoch 765/1000
 19/19 0s 5ms/step -
 accuracy: 0.7134 - loss: 0.5204 - val_accuracy: 0.7436 - val_loss: 0.5134
 Epoch 766/1000
 19/19 0s 5ms/step -
 accuracy: 0.7095 - loss: 0.5215 - val_accuracy: 0.7436 - val_loss: 0.5135
 Epoch 767/1000
 19/19 0s 6ms/step -
 accuracy: 0.7235 - loss: 0.5158 - val_accuracy: 0.7436 - val_loss: 0.5137
 Epoch 768/1000
 19/19 0s 6ms/step -
 accuracy: 0.7294 - loss: 0.5146 - val_accuracy: 0.7436 - val_loss: 0.5133
 Epoch 769/1000
 19/19 0s 5ms/step -
 accuracy: 0.7196 - loss: 0.5181 - val_accuracy: 0.7436 - val_loss: 0.5138
 Epoch 770/1000
 19/19 0s 7ms/step -
 accuracy: 0.6749 - loss: 0.5790 - val_accuracy: 0.7350 - val_loss: 0.5143
 Epoch 771/1000
 19/19 0s 6ms/step -
 accuracy: 0.6977 - loss: 0.5224 - val_accuracy: 0.7350 - val_loss: 0.5143
 Epoch 772/1000
 19/19 0s 5ms/step -
 accuracy: 0.7373 - loss: 0.4878 - val_accuracy: 0.7436 - val_loss: 0.5132
 Epoch 773/1000
 19/19 0s 6ms/step -
 accuracy: 0.7091 - loss: 0.5271 - val_accuracy: 0.7521 - val_loss: 0.5130
 Epoch 774/1000
 19/19 0s 6ms/step -
 accuracy: 0.7172 - loss: 0.5043 - val_accuracy: 0.7436 - val_loss: 0.5133
 Epoch 775/1000
 19/19 0s 5ms/step -
 accuracy: 0.7519 - loss: 0.5016 - val_accuracy: 0.7436 - val_loss: 0.5131
 Epoch 776/1000
 19/19 0s 5ms/step -
 accuracy: 0.7187 - loss: 0.5078 - val_accuracy: 0.7521 - val_loss: 0.5128
 Epoch 777/1000
 19/19 0s 5ms/step -

accuracy: 0.6958 - loss: 0.5464 - val_accuracy: 0.7436 - val_loss: 0.5133
 Epoch 778/1000
 19/19 0s 5ms/step -
 accuracy: 0.7254 - loss: 0.5234 - val_accuracy: 0.7436 - val_loss: 0.5132
 Epoch 779/1000
 19/19 0s 6ms/step -
 accuracy: 0.7332 - loss: 0.4922 - val_accuracy: 0.7521 - val_loss: 0.5128
 Epoch 780/1000
 19/19 0s 4ms/step -
 accuracy: 0.7528 - loss: 0.4849 - val_accuracy: 0.7521 - val_loss: 0.5126
 Epoch 781/1000
 19/19 0s 5ms/step -
 accuracy: 0.7046 - loss: 0.5251 - val_accuracy: 0.7521 - val_loss: 0.5126
 Epoch 782/1000
 19/19 0s 6ms/step -
 accuracy: 0.7202 - loss: 0.5528 - val_accuracy: 0.7436 - val_loss: 0.5130
 Epoch 783/1000
 19/19 0s 5ms/step -
 accuracy: 0.7226 - loss: 0.5105 - val_accuracy: 0.7521 - val_loss: 0.5126
 Epoch 784/1000
 19/19 0s 5ms/step -
 accuracy: 0.7511 - loss: 0.4881 - val_accuracy: 0.7436 - val_loss: 0.5129
 Epoch 785/1000
 19/19 0s 4ms/step -
 accuracy: 0.7335 - loss: 0.5031 - val_accuracy: 0.7436 - val_loss: 0.5130
 Epoch 786/1000
 19/19 0s 4ms/step -
 accuracy: 0.7224 - loss: 0.5024 - val_accuracy: 0.7436 - val_loss: 0.5129
 Epoch 787/1000
 19/19 0s 6ms/step -
 accuracy: 0.7135 - loss: 0.5355 - val_accuracy: 0.7436 - val_loss: 0.5132
 Epoch 788/1000
 19/19 0s 5ms/step -
 accuracy: 0.7436 - loss: 0.4921 - val_accuracy: 0.7436 - val_loss: 0.5126
 Epoch 789/1000
 19/19 0s 5ms/step -
 accuracy: 0.7245 - loss: 0.5037 - val_accuracy: 0.7521 - val_loss: 0.5125
 Epoch 790/1000
 19/19 0s 5ms/step -
 accuracy: 0.7101 - loss: 0.5333 - val_accuracy: 0.7436 - val_loss: 0.5125
 Epoch 791/1000
 19/19 0s 5ms/step -
 accuracy: 0.7299 - loss: 0.5133 - val_accuracy: 0.7521 - val_loss: 0.5125
 Epoch 792/1000
 19/19 0s 4ms/step -
 accuracy: 0.7040 - loss: 0.5232 - val_accuracy: 0.7436 - val_loss: 0.5128
 Epoch 793/1000
 19/19 0s 4ms/step -

accuracy: 0.6896 - loss: 0.5503 - val_accuracy: 0.7436 - val_loss: 0.5129
 Epoch 794/1000
 19/19 0s 4ms/step -
 accuracy: 0.7039 - loss: 0.5177 - val_accuracy: 0.7436 - val_loss: 0.5128
 Epoch 795/1000
 19/19 0s 4ms/step -
 accuracy: 0.7030 - loss: 0.5031 - val_accuracy: 0.7436 - val_loss: 0.5130
 Epoch 796/1000
 19/19 0s 6ms/step -
 accuracy: 0.7128 - loss: 0.5064 - val_accuracy: 0.7436 - val_loss: 0.5128
 Epoch 797/1000
 19/19 0s 5ms/step -
 accuracy: 0.7245 - loss: 0.5177 - val_accuracy: 0.7436 - val_loss: 0.5129
 Epoch 798/1000
 19/19 0s 4ms/step -
 accuracy: 0.6999 - loss: 0.5239 - val_accuracy: 0.7436 - val_loss: 0.5125
 Epoch 799/1000
 19/19 0s 4ms/step -
 accuracy: 0.7253 - loss: 0.4963 - val_accuracy: 0.7436 - val_loss: 0.5125
 Epoch 800/1000
 19/19 0s 4ms/step -
 accuracy: 0.7398 - loss: 0.4908 - val_accuracy: 0.7521 - val_loss: 0.5121
 Epoch 801/1000
 19/19 0s 5ms/step -
 accuracy: 0.6968 - loss: 0.5317 - val_accuracy: 0.7521 - val_loss: 0.5120
 Epoch 802/1000
 19/19 0s 5ms/step -
 accuracy: 0.7359 - loss: 0.5010 - val_accuracy: 0.7521 - val_loss: 0.5120
 Epoch 803/1000
 19/19 0s 5ms/step -
 accuracy: 0.7430 - loss: 0.4933 - val_accuracy: 0.7436 - val_loss: 0.5122
 Epoch 804/1000
 19/19 0s 4ms/step -
 accuracy: 0.7407 - loss: 0.5211 - val_accuracy: 0.7521 - val_loss: 0.5120
 Epoch 805/1000
 19/19 0s 4ms/step -
 accuracy: 0.7609 - loss: 0.4657 - val_accuracy: 0.7521 - val_loss: 0.5117
 Epoch 806/1000
 19/19 0s 5ms/step -
 accuracy: 0.7246 - loss: 0.5027 - val_accuracy: 0.7521 - val_loss: 0.5118
 Epoch 807/1000
 19/19 0s 4ms/step -
 accuracy: 0.7282 - loss: 0.4981 - val_accuracy: 0.7521 - val_loss: 0.5118
 Epoch 808/1000
 19/19 0s 4ms/step -
 accuracy: 0.7214 - loss: 0.5097 - val_accuracy: 0.7436 - val_loss: 0.5122
 Epoch 809/1000
 19/19 0s 4ms/step -

```

accuracy: 0.7201 - loss: 0.5004 - val_accuracy: 0.7436 - val_loss: 0.5121
Epoch 810/1000
19/19          0s 4ms/step -
accuracy: 0.7263 - loss: 0.4963 - val_accuracy: 0.7436 - val_loss: 0.5122
Epoch 811/1000
19/19          0s 4ms/step -
accuracy: 0.7065 - loss: 0.5168 - val_accuracy: 0.7436 - val_loss: 0.5120
Epoch 812/1000
19/19          0s 4ms/step -
accuracy: 0.7401 - loss: 0.4931 - val_accuracy: 0.7436 - val_loss: 0.5119
Epoch 813/1000
19/19          0s 6ms/step -
accuracy: 0.7213 - loss: 0.5213 - val_accuracy: 0.7436 - val_loss: 0.5123
Epoch 814/1000
19/19          0s 5ms/step -
accuracy: 0.7003 - loss: 0.5383 - val_accuracy: 0.7436 - val_loss: 0.5121
Epoch 815/1000
19/19          0s 5ms/step -
accuracy: 0.7123 - loss: 0.5220 - val_accuracy: 0.7436 - val_loss: 0.5121
Epoch 816/1000
19/19          0s 5ms/step -
accuracy: 0.7213 - loss: 0.5140 - val_accuracy: 0.7436 - val_loss: 0.5121
Epoch 817/1000
19/19          0s 4ms/step -
accuracy: 0.7200 - loss: 0.5047 - val_accuracy: 0.7436 - val_loss: 0.5120
Epoch 818/1000
19/19          0s 4ms/step -
accuracy: 0.7050 - loss: 0.5115 - val_accuracy: 0.7436 - val_loss: 0.5120
Epoch 819/1000
19/19          0s 4ms/step -
accuracy: 0.7071 - loss: 0.5286 - val_accuracy: 0.7436 - val_loss: 0.5122
Epoch 820/1000
19/19          0s 4ms/step -
accuracy: 0.7336 - loss: 0.4941 - val_accuracy: 0.7436 - val_loss: 0.5123
Epoch 821/1000
19/19          0s 5ms/step -
accuracy: 0.6929 - loss: 0.5446 - val_accuracy: 0.7350 - val_loss: 0.5124
Epoch 822/1000
19/19          0s 5ms/step -
accuracy: 0.7072 - loss: 0.5075 - val_accuracy: 0.7436 - val_loss: 0.5122
Epoch 823/1000
19/19          0s 4ms/step -
accuracy: 0.7187 - loss: 0.5120 - val_accuracy: 0.7436 - val_loss: 0.5120
Epoch 824/1000
19/19          0s 5ms/step -
accuracy: 0.7194 - loss: 0.5378 - val_accuracy: 0.7436 - val_loss: 0.5118
Epoch 825/1000
19/19          0s 5ms/step -

```


accuracy: 0.7154 - loss: 0.5028 - val_accuracy: 0.7436 - val_loss: 0.5119
 Epoch 826/1000
 19/19 0s 5ms/step -
 accuracy: 0.7279 - loss: 0.5184 - val_accuracy: 0.7436 - val_loss: 0.5119
 Epoch 827/1000
 19/19 0s 5ms/step -
 accuracy: 0.7248 - loss: 0.5106 - val_accuracy: 0.7436 - val_loss: 0.5120
 Epoch 828/1000
 19/19 0s 6ms/step -
 accuracy: 0.7038 - loss: 0.5422 - val_accuracy: 0.7436 - val_loss: 0.5122
 Epoch 829/1000
 19/19 0s 5ms/step -
 accuracy: 0.7415 - loss: 0.4956 - val_accuracy: 0.7436 - val_loss: 0.5118
 Epoch 830/1000
 19/19 0s 4ms/step -
 accuracy: 0.7123 - loss: 0.5099 - val_accuracy: 0.7436 - val_loss: 0.5118
 Epoch 831/1000
 19/19 0s 4ms/step -
 accuracy: 0.7327 - loss: 0.4894 - val_accuracy: 0.7521 - val_loss: 0.5111
 Epoch 832/1000
 19/19 0s 4ms/step -
 accuracy: 0.7125 - loss: 0.5351 - val_accuracy: 0.7436 - val_loss: 0.5116
 Epoch 833/1000
 19/19 0s 4ms/step -
 accuracy: 0.6989 - loss: 0.5284 - val_accuracy: 0.7436 - val_loss: 0.5120
 Epoch 834/1000
 19/19 0s 4ms/step -
 accuracy: 0.7030 - loss: 0.5221 - val_accuracy: 0.7436 - val_loss: 0.5120
 Epoch 835/1000
 19/19 0s 5ms/step -
 accuracy: 0.7424 - loss: 0.4830 - val_accuracy: 0.7521 - val_loss: 0.5112
 Epoch 836/1000
 19/19 0s 6ms/step -
 accuracy: 0.7537 - loss: 0.4979 - val_accuracy: 0.7521 - val_loss: 0.5110
 Epoch 837/1000
 19/19 0s 5ms/step -
 accuracy: 0.7295 - loss: 0.5041 - val_accuracy: 0.7436 - val_loss: 0.5113
 Epoch 838/1000
 19/19 0s 5ms/step -
 accuracy: 0.7020 - loss: 0.5318 - val_accuracy: 0.7436 - val_loss: 0.5113
 Epoch 839/1000
 19/19 0s 4ms/step -
 accuracy: 0.7191 - loss: 0.5018 - val_accuracy: 0.7436 - val_loss: 0.5116
 Epoch 840/1000
 19/19 0s 4ms/step -
 accuracy: 0.7354 - loss: 0.5087 - val_accuracy: 0.7436 - val_loss: 0.5113
 Epoch 841/1000
 19/19 0s 4ms/step -

accuracy: 0.7253 - loss: 0.4998 - val_accuracy: 0.7436 - val_loss: 0.5112
 Epoch 842/1000
 19/19 0s 4ms/step -
 accuracy: 0.7339 - loss: 0.5024 - val_accuracy: 0.7436 - val_loss: 0.5110
 Epoch 843/1000
 19/19 0s 5ms/step -
 accuracy: 0.7445 - loss: 0.5038 - val_accuracy: 0.7521 - val_loss: 0.5108
 Epoch 844/1000
 19/19 0s 4ms/step -
 accuracy: 0.7507 - loss: 0.4872 - val_accuracy: 0.7521 - val_loss: 0.5108
 Epoch 845/1000
 19/19 0s 7ms/step -
 accuracy: 0.7313 - loss: 0.5059 - val_accuracy: 0.7436 - val_loss: 0.5110
 Epoch 846/1000
 19/19 0s 5ms/step -
 accuracy: 0.7248 - loss: 0.5196 - val_accuracy: 0.7436 - val_loss: 0.5108
 Epoch 847/1000
 19/19 0s 5ms/step -
 accuracy: 0.7230 - loss: 0.5119 - val_accuracy: 0.7436 - val_loss: 0.5113
 Epoch 848/1000
 19/19 0s 4ms/step -
 accuracy: 0.7328 - loss: 0.5026 - val_accuracy: 0.7436 - val_loss: 0.5113
 Epoch 849/1000
 19/19 0s 4ms/step -
 accuracy: 0.7187 - loss: 0.5092 - val_accuracy: 0.7436 - val_loss: 0.5108
 Epoch 850/1000
 19/19 0s 4ms/step -
 accuracy: 0.7055 - loss: 0.5339 - val_accuracy: 0.7521 - val_loss: 0.5104
 Epoch 851/1000
 19/19 0s 4ms/step -
 accuracy: 0.7133 - loss: 0.5109 - val_accuracy: 0.7521 - val_loss: 0.5107
 Epoch 852/1000
 19/19 0s 5ms/step -
 accuracy: 0.7378 - loss: 0.4980 - val_accuracy: 0.7436 - val_loss: 0.5108
 Epoch 853/1000
 19/19 0s 5ms/step -
 accuracy: 0.7239 - loss: 0.4948 - val_accuracy: 0.7521 - val_loss: 0.5106
 Epoch 854/1000
 19/19 0s 7ms/step -
 accuracy: 0.7266 - loss: 0.4775 - val_accuracy: 0.7521 - val_loss: 0.5103
 Epoch 855/1000
 19/19 0s 5ms/step -
 accuracy: 0.7198 - loss: 0.5301 - val_accuracy: 0.7521 - val_loss: 0.5104
 Epoch 856/1000
 19/19 0s 5ms/step -
 accuracy: 0.7246 - loss: 0.5069 - val_accuracy: 0.7521 - val_loss: 0.5103
 Epoch 857/1000
 19/19 0s 5ms/step -

accuracy: 0.7360 - loss: 0.4942 - val_accuracy: 0.7521 - val_loss: 0.5105
 Epoch 858/1000
 19/19 0s 4ms/step -
 accuracy: 0.7197 - loss: 0.5135 - val_accuracy: 0.7521 - val_loss: 0.5103
 Epoch 859/1000
 19/19 0s 5ms/step -
 accuracy: 0.7416 - loss: 0.5063 - val_accuracy: 0.7521 - val_loss: 0.5098
 Epoch 860/1000
 19/19 0s 4ms/step -
 accuracy: 0.7169 - loss: 0.5142 - val_accuracy: 0.7521 - val_loss: 0.5103
 Epoch 861/1000
 19/19 0s 4ms/step -
 accuracy: 0.7186 - loss: 0.5276 - val_accuracy: 0.7521 - val_loss: 0.5104
 Epoch 862/1000
 19/19 0s 7ms/step -
 accuracy: 0.7197 - loss: 0.5212 - val_accuracy: 0.7436 - val_loss: 0.5105
 Epoch 863/1000
 19/19 0s 7ms/step -
 accuracy: 0.7194 - loss: 0.5049 - val_accuracy: 0.7436 - val_loss: 0.5105
 Epoch 864/1000
 19/19 0s 7ms/step -
 accuracy: 0.7436 - loss: 0.4928 - val_accuracy: 0.7436 - val_loss: 0.5105
 Epoch 865/1000
 19/19 0s 6ms/step -
 accuracy: 0.7352 - loss: 0.4975 - val_accuracy: 0.7521 - val_loss: 0.5102
 Epoch 866/1000
 19/19 0s 5ms/step -
 accuracy: 0.7477 - loss: 0.4906 - val_accuracy: 0.7521 - val_loss: 0.5101
 Epoch 867/1000
 19/19 0s 6ms/step -
 accuracy: 0.7165 - loss: 0.5144 - val_accuracy: 0.7436 - val_loss: 0.5103
 Epoch 868/1000
 19/19 0s 7ms/step -
 accuracy: 0.7320 - loss: 0.4945 - val_accuracy: 0.7521 - val_loss: 0.5099
 Epoch 869/1000
 19/19 0s 6ms/step -
 accuracy: 0.7484 - loss: 0.4871 - val_accuracy: 0.7521 - val_loss: 0.5100
 Epoch 870/1000
 19/19 0s 6ms/step -
 accuracy: 0.7188 - loss: 0.5028 - val_accuracy: 0.7436 - val_loss: 0.5102
 Epoch 871/1000
 19/19 0s 9ms/step -
 accuracy: 0.6975 - loss: 0.5204 - val_accuracy: 0.7436 - val_loss: 0.5106
 Epoch 872/1000
 19/19 0s 6ms/step -
 accuracy: 0.7672 - loss: 0.4715 - val_accuracy: 0.7521 - val_loss: 0.5101
 Epoch 873/1000
 19/19 0s 6ms/step -

accuracy: 0.7275 - loss: 0.4981 - val_accuracy: 0.7521 - val_loss: 0.5099
 Epoch 874/1000
 19/19 0s 6ms/step -
 accuracy: 0.7472 - loss: 0.4914 - val_accuracy: 0.7521 - val_loss: 0.5098
 Epoch 875/1000
 19/19 0s 5ms/step -
 accuracy: 0.7378 - loss: 0.4963 - val_accuracy: 0.7521 - val_loss: 0.5100
 Epoch 876/1000
 19/19 0s 5ms/step -
 accuracy: 0.7159 - loss: 0.5107 - val_accuracy: 0.7436 - val_loss: 0.5103
 Epoch 877/1000
 19/19 0s 4ms/step -
 accuracy: 0.7584 - loss: 0.5031 - val_accuracy: 0.7521 - val_loss: 0.5097
 Epoch 878/1000
 19/19 0s 4ms/step -
 accuracy: 0.7591 - loss: 0.4867 - val_accuracy: 0.7521 - val_loss: 0.5094
 Epoch 879/1000
 19/19 0s 4ms/step -
 accuracy: 0.7259 - loss: 0.4973 - val_accuracy: 0.7521 - val_loss: 0.5096
 Epoch 880/1000
 19/19 0s 5ms/step -
 accuracy: 0.7668 - loss: 0.5025 - val_accuracy: 0.7521 - val_loss: 0.5093
 Epoch 881/1000
 19/19 0s 5ms/step -
 accuracy: 0.7245 - loss: 0.5130 - val_accuracy: 0.7521 - val_loss: 0.5094
 Epoch 882/1000
 19/19 0s 5ms/step -
 accuracy: 0.7317 - loss: 0.5011 - val_accuracy: 0.7521 - val_loss: 0.5095
 Epoch 883/1000
 19/19 0s 4ms/step -
 accuracy: 0.7440 - loss: 0.4977 - val_accuracy: 0.7521 - val_loss: 0.5093
 Epoch 884/1000
 19/19 0s 5ms/step -
 accuracy: 0.7225 - loss: 0.5140 - val_accuracy: 0.7521 - val_loss: 0.5096
 Epoch 885/1000
 19/19 0s 4ms/step -
 accuracy: 0.7014 - loss: 0.5229 - val_accuracy: 0.7436 - val_loss: 0.5099
 Epoch 886/1000
 19/19 0s 4ms/step -
 accuracy: 0.7515 - loss: 0.4876 - val_accuracy: 0.7521 - val_loss: 0.5096
 Epoch 887/1000
 19/19 0s 5ms/step -
 accuracy: 0.7324 - loss: 0.4996 - val_accuracy: 0.7436 - val_loss: 0.5098
 Epoch 888/1000
 19/19 0s 5ms/step -
 accuracy: 0.7035 - loss: 0.5474 - val_accuracy: 0.7436 - val_loss: 0.5100
 Epoch 889/1000
 19/19 0s 7ms/step -

accuracy: 0.7382 - loss: 0.4967 - val_accuracy: 0.7436 - val_loss: 0.5100
 Epoch 890/1000
 19/19 0s 4ms/step -
 accuracy: 0.7071 - loss: 0.5155 - val_accuracy: 0.7436 - val_loss: 0.5099
 Epoch 891/1000
 19/19 0s 4ms/step -
 accuracy: 0.7423 - loss: 0.4958 - val_accuracy: 0.7436 - val_loss: 0.5099
 Epoch 892/1000
 19/19 0s 4ms/step -
 accuracy: 0.7182 - loss: 0.5148 - val_accuracy: 0.7436 - val_loss: 0.5100
 Epoch 893/1000
 19/19 0s 4ms/step -
 accuracy: 0.7315 - loss: 0.4861 - val_accuracy: 0.7436 - val_loss: 0.5101
 Epoch 894/1000
 19/19 0s 5ms/step -
 accuracy: 0.6984 - loss: 0.5402 - val_accuracy: 0.7436 - val_loss: 0.5100
 Epoch 895/1000
 19/19 0s 5ms/step -
 accuracy: 0.7437 - loss: 0.4934 - val_accuracy: 0.7436 - val_loss: 0.5101
 Epoch 896/1000
 19/19 0s 6ms/step -
 accuracy: 0.7168 - loss: 0.5446 - val_accuracy: 0.7436 - val_loss: 0.5102
 Epoch 897/1000
 19/19 0s 4ms/step -
 accuracy: 0.7259 - loss: 0.5147 - val_accuracy: 0.7436 - val_loss: 0.5096
 Epoch 898/1000
 19/19 0s 4ms/step -
 accuracy: 0.7204 - loss: 0.5429 - val_accuracy: 0.7436 - val_loss: 0.5096
 Epoch 899/1000
 19/19 0s 5ms/step -
 accuracy: 0.7320 - loss: 0.5082 - val_accuracy: 0.7436 - val_loss: 0.5097
 Epoch 900/1000
 19/19 0s 4ms/step -
 accuracy: 0.7519 - loss: 0.4824 - val_accuracy: 0.7436 - val_loss: 0.5094
 Epoch 901/1000
 19/19 0s 4ms/step -
 accuracy: 0.7130 - loss: 0.5403 - val_accuracy: 0.7521 - val_loss: 0.5092
 Epoch 902/1000
 19/19 0s 5ms/step -
 accuracy: 0.7308 - loss: 0.4939 - val_accuracy: 0.7436 - val_loss: 0.5095
 Epoch 903/1000
 19/19 0s 4ms/step -
 accuracy: 0.7589 - loss: 0.4937 - val_accuracy: 0.7521 - val_loss: 0.5092
 Epoch 904/1000
 19/19 0s 7ms/step -
 accuracy: 0.7394 - loss: 0.4909 - val_accuracy: 0.7436 - val_loss: 0.5093
 Epoch 905/1000
 19/19 0s 4ms/step -

accuracy: 0.7180 - loss: 0.5328 - val_accuracy: 0.7436 - val_loss: 0.5094
 Epoch 906/1000
 19/19 0s 4ms/step -
 accuracy: 0.7142 - loss: 0.5240 - val_accuracy: 0.7436 - val_loss: 0.5095
 Epoch 907/1000
 19/19 0s 4ms/step -
 accuracy: 0.7043 - loss: 0.5276 - val_accuracy: 0.7436 - val_loss: 0.5103
 Epoch 908/1000
 19/19 0s 5ms/step -
 accuracy: 0.7324 - loss: 0.5005 - val_accuracy: 0.7436 - val_loss: 0.5095
 Epoch 909/1000
 19/19 0s 5ms/step -
 accuracy: 0.7339 - loss: 0.5074 - val_accuracy: 0.7436 - val_loss: 0.5096
 Epoch 910/1000
 19/19 0s 5ms/step -
 accuracy: 0.7304 - loss: 0.5044 - val_accuracy: 0.7436 - val_loss: 0.5095
 Epoch 911/1000
 19/19 0s 8ms/step -
 accuracy: 0.7290 - loss: 0.4904 - val_accuracy: 0.7436 - val_loss: 0.5092
 Epoch 912/1000
 19/19 0s 5ms/step -
 accuracy: 0.7102 - loss: 0.5221 - val_accuracy: 0.7436 - val_loss: 0.5095
 Epoch 913/1000
 19/19 0s 4ms/step -
 accuracy: 0.7034 - loss: 0.5130 - val_accuracy: 0.7436 - val_loss: 0.5097
 Epoch 914/1000
 19/19 0s 5ms/step -
 accuracy: 0.7242 - loss: 0.4961 - val_accuracy: 0.7521 - val_loss: 0.5090
 Epoch 915/1000
 19/19 0s 4ms/step -
 accuracy: 0.7139 - loss: 0.5106 - val_accuracy: 0.7521 - val_loss: 0.5089
 Epoch 916/1000
 19/19 0s 4ms/step -
 accuracy: 0.7339 - loss: 0.5114 - val_accuracy: 0.7521 - val_loss: 0.5086
 Epoch 917/1000
 19/19 0s 4ms/step -
 accuracy: 0.7465 - loss: 0.5168 - val_accuracy: 0.7521 - val_loss: 0.5085
 Epoch 918/1000
 19/19 0s 7ms/step -
 accuracy: 0.7529 - loss: 0.4854 - val_accuracy: 0.7521 - val_loss: 0.5087
 Epoch 919/1000
 19/19 0s 5ms/step -
 accuracy: 0.7498 - loss: 0.4875 - val_accuracy: 0.7521 - val_loss: 0.5088
 Epoch 920/1000
 19/19 0s 5ms/step -
 accuracy: 0.7262 - loss: 0.4973 - val_accuracy: 0.7436 - val_loss: 0.5088
 Epoch 921/1000
 19/19 0s 5ms/step -

accuracy: 0.7306 - loss: 0.4941 - val_accuracy: 0.7436 - val_loss: 0.5089
 Epoch 922/1000
 19/19 0s 5ms/step -
 accuracy: 0.6987 - loss: 0.5072 - val_accuracy: 0.7436 - val_loss: 0.5090
 Epoch 923/1000
 19/19 0s 5ms/step -
 accuracy: 0.7331 - loss: 0.4998 - val_accuracy: 0.7436 - val_loss: 0.5091
 Epoch 924/1000
 19/19 0s 4ms/step -
 accuracy: 0.7118 - loss: 0.4978 - val_accuracy: 0.7521 - val_loss: 0.5085
 Epoch 925/1000
 19/19 0s 4ms/step -
 accuracy: 0.7052 - loss: 0.5313 - val_accuracy: 0.7521 - val_loss: 0.5084
 Epoch 926/1000
 19/19 0s 7ms/step -
 accuracy: 0.7053 - loss: 0.5253 - val_accuracy: 0.7521 - val_loss: 0.5085
 Epoch 927/1000
 19/19 0s 5ms/step -
 accuracy: 0.7201 - loss: 0.5140 - val_accuracy: 0.7436 - val_loss: 0.5087
 Epoch 928/1000
 19/19 0s 5ms/step -
 accuracy: 0.7235 - loss: 0.5208 - val_accuracy: 0.7521 - val_loss: 0.5086
 Epoch 929/1000
 19/19 0s 5ms/step -
 accuracy: 0.7076 - loss: 0.5270 - val_accuracy: 0.7436 - val_loss: 0.5086
 Epoch 930/1000
 19/19 0s 4ms/step -
 accuracy: 0.7304 - loss: 0.5009 - val_accuracy: 0.7521 - val_loss: 0.5085
 Epoch 931/1000
 19/19 0s 4ms/step -
 accuracy: 0.7400 - loss: 0.5055 - val_accuracy: 0.7521 - val_loss: 0.5083
 Epoch 932/1000
 19/19 0s 4ms/step -
 accuracy: 0.7655 - loss: 0.4942 - val_accuracy: 0.7521 - val_loss: 0.5082
 Epoch 933/1000
 19/19 0s 4ms/step -
 accuracy: 0.6865 - loss: 0.5353 - val_accuracy: 0.7436 - val_loss: 0.5086
 Epoch 934/1000
 19/19 0s 5ms/step -
 accuracy: 0.7535 - loss: 0.4809 - val_accuracy: 0.7436 - val_loss: 0.5086
 Epoch 935/1000
 19/19 0s 5ms/step -
 accuracy: 0.7373 - loss: 0.5047 - val_accuracy: 0.7521 - val_loss: 0.5083
 Epoch 936/1000
 19/19 0s 7ms/step -
 accuracy: 0.7235 - loss: 0.5102 - val_accuracy: 0.7521 - val_loss: 0.5083
 Epoch 937/1000
 19/19 0s 6ms/step -

accuracy: 0.7077 - loss: 0.5467 - val_accuracy: 0.7521 - val_loss: 0.5083
 Epoch 938/1000
 19/19 0s 6ms/step -
 accuracy: 0.7250 - loss: 0.5201 - val_accuracy: 0.7521 - val_loss: 0.5081
 Epoch 939/1000
 19/19 0s 6ms/step -
 accuracy: 0.7061 - loss: 0.4990 - val_accuracy: 0.7436 - val_loss: 0.5087
 Epoch 940/1000
 19/19 0s 5ms/step -
 accuracy: 0.7201 - loss: 0.5037 - val_accuracy: 0.7521 - val_loss: 0.5092
 Epoch 941/1000
 19/19 0s 5ms/step -
 accuracy: 0.7152 - loss: 0.5074 - val_accuracy: 0.7436 - val_loss: 0.5084
 Epoch 942/1000
 19/19 0s 5ms/step -
 accuracy: 0.7405 - loss: 0.4864 - val_accuracy: 0.7521 - val_loss: 0.5081
 Epoch 943/1000
 19/19 0s 5ms/step -
 accuracy: 0.7295 - loss: 0.5122 - val_accuracy: 0.7521 - val_loss: 0.5080
 Epoch 944/1000
 19/19 0s 5ms/step -
 accuracy: 0.7052 - loss: 0.5111 - val_accuracy: 0.7521 - val_loss: 0.5080
 Epoch 945/1000
 19/19 0s 5ms/step -
 accuracy: 0.7198 - loss: 0.5125 - val_accuracy: 0.7521 - val_loss: 0.5080
 Epoch 946/1000
 19/19 0s 4ms/step -
 accuracy: 0.6997 - loss: 0.5338 - val_accuracy: 0.7436 - val_loss: 0.5083
 Epoch 947/1000
 19/19 0s 4ms/step -
 accuracy: 0.7180 - loss: 0.5065 - val_accuracy: 0.7436 - val_loss: 0.5083
 Epoch 948/1000
 19/19 0s 5ms/step -
 accuracy: 0.7545 - loss: 0.5134 - val_accuracy: 0.7521 - val_loss: 0.5082
 Epoch 949/1000
 19/19 0s 5ms/step -
 accuracy: 0.7140 - loss: 0.5012 - val_accuracy: 0.7436 - val_loss: 0.5083
 Epoch 950/1000
 19/19 0s 5ms/step -
 accuracy: 0.7340 - loss: 0.4990 - val_accuracy: 0.7521 - val_loss: 0.5082
 Epoch 951/1000
 19/19 0s 6ms/step -
 accuracy: 0.7050 - loss: 0.5264 - val_accuracy: 0.7436 - val_loss: 0.5086
 Epoch 952/1000
 19/19 0s 5ms/step -
 accuracy: 0.7236 - loss: 0.5038 - val_accuracy: 0.7436 - val_loss: 0.5086
 Epoch 953/1000
 19/19 0s 5ms/step -

accuracy: 0.7331 - loss: 0.4913 - val_accuracy: 0.7521 - val_loss: 0.5081
 Epoch 954/1000
 19/19 0s 5ms/step -
 accuracy: 0.7186 - loss: 0.5242 - val_accuracy: 0.7436 - val_loss: 0.5082
 Epoch 955/1000
 19/19 0s 5ms/step -
 accuracy: 0.6837 - loss: 0.5463 - val_accuracy: 0.7436 - val_loss: 0.5086
 Epoch 956/1000
 19/19 0s 4ms/step -
 accuracy: 0.7250 - loss: 0.4964 - val_accuracy: 0.7436 - val_loss: 0.5086
 Epoch 957/1000
 19/19 0s 4ms/step -
 accuracy: 0.7155 - loss: 0.5211 - val_accuracy: 0.7436 - val_loss: 0.5090
 Epoch 958/1000
 19/19 0s 5ms/step -
 accuracy: 0.7431 - loss: 0.5036 - val_accuracy: 0.7436 - val_loss: 0.5085
 Epoch 959/1000
 19/19 0s 5ms/step -
 accuracy: 0.7055 - loss: 0.5253 - val_accuracy: 0.7436 - val_loss: 0.5085
 Epoch 960/1000
 19/19 0s 5ms/step -
 accuracy: 0.7086 - loss: 0.5195 - val_accuracy: 0.7436 - val_loss: 0.5083
 Epoch 961/1000
 19/19 0s 4ms/step -
 accuracy: 0.7005 - loss: 0.5200 - val_accuracy: 0.7436 - val_loss: 0.5082
 Epoch 962/1000
 19/19 0s 5ms/step -
 accuracy: 0.7160 - loss: 0.5252 - val_accuracy: 0.7436 - val_loss: 0.5082
 Epoch 963/1000
 19/19 0s 4ms/step -
 accuracy: 0.7346 - loss: 0.4972 - val_accuracy: 0.7521 - val_loss: 0.5077
 Epoch 964/1000
 19/19 0s 4ms/step -
 accuracy: 0.7211 - loss: 0.5173 - val_accuracy: 0.7521 - val_loss: 0.5078
 Epoch 965/1000
 19/19 0s 5ms/step -
 accuracy: 0.7535 - loss: 0.5003 - val_accuracy: 0.7521 - val_loss: 0.5077
 Epoch 966/1000
 19/19 0s 5ms/step -
 accuracy: 0.7324 - loss: 0.4911 - val_accuracy: 0.7521 - val_loss: 0.5078
 Epoch 967/1000
 19/19 0s 5ms/step -
 accuracy: 0.7212 - loss: 0.5345 - val_accuracy: 0.7521 - val_loss: 0.5079
 Epoch 968/1000
 19/19 0s 7ms/step -
 accuracy: 0.7447 - loss: 0.4798 - val_accuracy: 0.7521 - val_loss: 0.5078
 Epoch 969/1000
 19/19 0s 5ms/step -

accuracy: 0.7353 - loss: 0.5011 - val_accuracy: 0.7521 - val_loss: 0.5079
 Epoch 970/1000
 19/19 0s 4ms/step -
 accuracy: 0.7235 - loss: 0.5074 - val_accuracy: 0.7521 - val_loss: 0.5079
 Epoch 971/1000
 19/19 0s 5ms/step -
 accuracy: 0.7009 - loss: 0.5436 - val_accuracy: 0.7436 - val_loss: 0.5080
 Epoch 972/1000
 19/19 0s 4ms/step -
 accuracy: 0.7278 - loss: 0.5001 - val_accuracy: 0.7521 - val_loss: 0.5079
 Epoch 973/1000
 19/19 0s 5ms/step -
 accuracy: 0.7639 - loss: 0.4666 - val_accuracy: 0.7521 - val_loss: 0.5077
 Epoch 974/1000
 19/19 0s 5ms/step -
 accuracy: 0.7470 - loss: 0.5062 - val_accuracy: 0.7521 - val_loss: 0.5075
 Epoch 975/1000
 19/19 0s 4ms/step -
 accuracy: 0.7490 - loss: 0.4844 - val_accuracy: 0.7521 - val_loss: 0.5076
 Epoch 976/1000
 19/19 0s 4ms/step -
 accuracy: 0.7424 - loss: 0.4959 - val_accuracy: 0.7521 - val_loss: 0.5072
 Epoch 977/1000
 19/19 0s 5ms/step -
 accuracy: 0.7520 - loss: 0.4691 - val_accuracy: 0.7521 - val_loss: 0.5071
 Epoch 978/1000
 19/19 0s 7ms/step -
 accuracy: 0.7275 - loss: 0.5022 - val_accuracy: 0.7521 - val_loss: 0.5074
 Epoch 979/1000
 19/19 0s 5ms/step -
 accuracy: 0.7383 - loss: 0.4950 - val_accuracy: 0.7521 - val_loss: 0.5075
 Epoch 980/1000
 19/19 0s 5ms/step -
 accuracy: 0.7304 - loss: 0.5048 - val_accuracy: 0.7521 - val_loss: 0.5074
 Epoch 981/1000
 19/19 0s 4ms/step -
 accuracy: 0.7352 - loss: 0.4999 - val_accuracy: 0.7521 - val_loss: 0.5073
 Epoch 982/1000
 19/19 0s 4ms/step -
 accuracy: 0.7203 - loss: 0.5081 - val_accuracy: 0.7521 - val_loss: 0.5076
 Epoch 983/1000
 19/19 0s 4ms/step -
 accuracy: 0.7038 - loss: 0.5226 - val_accuracy: 0.7436 - val_loss: 0.5081
 Epoch 984/1000
 19/19 0s 4ms/step -
 accuracy: 0.7182 - loss: 0.5201 - val_accuracy: 0.7436 - val_loss: 0.5078
 Epoch 985/1000
 19/19 0s 4ms/step -

```

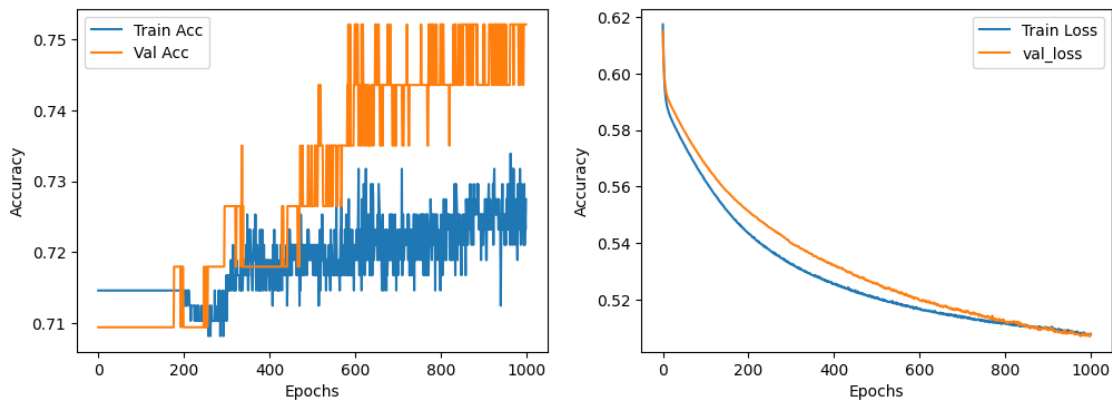
accuracy: 0.7357 - loss: 0.4919 - val_accuracy: 0.7521 - val_loss: 0.5074
Epoch 986/1000
19/19          0s 6ms/step -
accuracy: 0.7100 - loss: 0.5219 - val_accuracy: 0.7521 - val_loss: 0.5076
Epoch 987/1000
19/19          0s 4ms/step -
accuracy: 0.7339 - loss: 0.4953 - val_accuracy: 0.7436 - val_loss: 0.5077
Epoch 988/1000
19/19          0s 4ms/step -
accuracy: 0.7241 - loss: 0.5151 - val_accuracy: 0.7521 - val_loss: 0.5076
Epoch 989/1000
19/19          0s 4ms/step -
accuracy: 0.7099 - loss: 0.5460 - val_accuracy: 0.7521 - val_loss: 0.5073
Epoch 990/1000
19/19          0s 5ms/step -
accuracy: 0.7401 - loss: 0.5015 - val_accuracy: 0.7521 - val_loss: 0.5072
Epoch 991/1000
19/19          0s 4ms/step -
accuracy: 0.7322 - loss: 0.5117 - val_accuracy: 0.7521 - val_loss: 0.5075
Epoch 992/1000
19/19          0s 4ms/step -
accuracy: 0.7130 - loss: 0.5177 - val_accuracy: 0.7521 - val_loss: 0.5076
Epoch 993/1000
19/19          0s 4ms/step -
accuracy: 0.7395 - loss: 0.4934 - val_accuracy: 0.7436 - val_loss: 0.5079
Epoch 994/1000
19/19          0s 4ms/step -
accuracy: 0.7021 - loss: 0.5177 - val_accuracy: 0.7436 - val_loss: 0.5080
Epoch 995/1000
19/19          0s 5ms/step -
accuracy: 0.7378 - loss: 0.4887 - val_accuracy: 0.7521 - val_loss: 0.5073
Epoch 996/1000
19/19          0s 4ms/step -
accuracy: 0.7549 - loss: 0.4795 - val_accuracy: 0.7521 - val_loss: 0.5072
Epoch 997/1000
19/19          0s 4ms/step -
accuracy: 0.7371 - loss: 0.4788 - val_accuracy: 0.7521 - val_loss: 0.5071
Epoch 998/1000
19/19          0s 5ms/step -
accuracy: 0.6896 - loss: 0.5597 - val_accuracy: 0.7521 - val_loss: 0.5076
Epoch 999/1000
19/19          0s 8ms/step -
accuracy: 0.7446 - loss: 0.4951 - val_accuracy: 0.7521 - val_loss: 0.5073
Epoch 1000/1000
19/19          0s 4ms/step -
accuracy: 0.7295 - loss: 0.5163 - val_accuracy: 0.7521 - val_loss: 0.5075

```

```
[52]: val_acc = history.history['val_accuracy'][-1]
print(f"Final accuracy using Relu activation function {val_acc*100:.2f}%")
```

Final accuracy using Relu activation function 75.21%

```
[53]: plt.figure(figsize=(12,4))
plt.subplot(1,2,1)
plt.plot(history.history['accuracy'], label='Train Acc')
plt.plot(history.history['val_accuracy'], label='Val Acc')
plt.xlabel('Epochs')
plt.ylabel('Accuracy')
plt.legend()
plt.subplot(1,2,2)
plt.plot(history.history['loss'], label='Train Loss')
plt.plot(history.history['val_loss'], label = 'val_loss')
plt.xlabel('Epochs')
plt.ylabel('Accuracy')
plt.legend()
plt.show()
```



0.6.2 Using tanh activation, batch_size = 40 and 1000 epochs

```
[54]: model = Sequential()
model.add(Dense(10, activation = 'tanh', input_shape = (9,)))
model.add(Dense(1, activation = 'sigmoid'))
model.summary()
model.compile(loss = "BinaryCrossentropy", optimizer = "SGD", metrics = _
↳ ["accuracy"])
history = model.fit(x_train,y_train, batch_size=40, epochs = 1000, verbose=1,_
↳ validation_data=(x_test,y_test))
```

Model: "sequential_5"

Layer (type)	Output Shape	Param #
dense_8 (Dense)	(None, 10)	100
dense_9 (Dense)	(None, 1)	11

Total params: 111 (444.00 B)

Trainable params: 111 (444.00 B)

Non-trainable params: 0 (0.00 B)

```
Epoch 1/1000
12/12          1s 20ms/step -
accuracy: 0.6572 - loss: 0.6544 - val_accuracy: 0.7094 - val_loss: 0.6326
Epoch 2/1000
12/12          0s 9ms/step -
accuracy: 0.6849 - loss: 0.6404 - val_accuracy: 0.7094 - val_loss: 0.6275
Epoch 3/1000
12/12          0s 10ms/step -
accuracy: 0.6854 - loss: 0.6371 - val_accuracy: 0.7094 - val_loss: 0.6235
Epoch 4/1000
12/12          0s 8ms/step -
accuracy: 0.7127 - loss: 0.6131 - val_accuracy: 0.7094 - val_loss: 0.6203
Epoch 5/1000
12/12          0s 9ms/step -
accuracy: 0.6971 - loss: 0.6217 - val_accuracy: 0.7094 - val_loss: 0.6177
Epoch 6/1000
12/12          0s 9ms/step -
accuracy: 0.7238 - loss: 0.6069 - val_accuracy: 0.7094 - val_loss: 0.6156
Epoch 7/1000
12/12          0s 8ms/step -
accuracy: 0.7077 - loss: 0.6231 - val_accuracy: 0.7094 - val_loss: 0.6138
Epoch 8/1000
12/12          0s 10ms/step -
accuracy: 0.7123 - loss: 0.6137 - val_accuracy: 0.7094 - val_loss: 0.6123
Epoch 9/1000
12/12          0s 8ms/step -
accuracy: 0.7056 - loss: 0.6152 - val_accuracy: 0.7094 - val_loss: 0.6109
Epoch 10/1000
12/12          0s 10ms/step -
accuracy: 0.7243 - loss: 0.6040 - val_accuracy: 0.7094 - val_loss: 0.6098
Epoch 11/1000
12/12          0s 8ms/step -
```

accuracy: 0.7010 - loss: 0.6217 - val_accuracy: 0.7094 - val_loss: 0.6088
 Epoch 12/1000
 12/12 0s 7ms/step -
 accuracy: 0.7089 - loss: 0.6142 - val_accuracy: 0.7094 - val_loss: 0.6080
 Epoch 13/1000
 12/12 0s 8ms/step -
 accuracy: 0.7145 - loss: 0.6116 - val_accuracy: 0.7094 - val_loss: 0.6073
 Epoch 14/1000
 12/12 0s 9ms/step -
 accuracy: 0.7074 - loss: 0.6137 - val_accuracy: 0.7094 - val_loss: 0.6067
 Epoch 15/1000
 12/12 0s 8ms/step -
 accuracy: 0.7183 - loss: 0.6034 - val_accuracy: 0.7094 - val_loss: 0.6061
 Epoch 16/1000
 12/12 0s 8ms/step -
 accuracy: 0.7175 - loss: 0.6086 - val_accuracy: 0.7094 - val_loss: 0.6055
 Epoch 17/1000
 12/12 0s 7ms/step -
 accuracy: 0.7393 - loss: 0.5872 - val_accuracy: 0.7094 - val_loss: 0.6051
 Epoch 18/1000
 12/12 0s 7ms/step -
 accuracy: 0.7207 - loss: 0.5977 - val_accuracy: 0.7094 - val_loss: 0.6047
 Epoch 19/1000
 12/12 0s 8ms/step -
 accuracy: 0.7536 - loss: 0.5807 - val_accuracy: 0.7094 - val_loss: 0.6043
 Epoch 20/1000
 12/12 0s 8ms/step -
 accuracy: 0.7118 - loss: 0.6038 - val_accuracy: 0.7094 - val_loss: 0.6039
 Epoch 21/1000
 12/12 0s 7ms/step -
 accuracy: 0.6957 - loss: 0.6243 - val_accuracy: 0.7094 - val_loss: 0.6036
 Epoch 22/1000
 12/12 0s 8ms/step -
 accuracy: 0.6981 - loss: 0.6191 - val_accuracy: 0.7094 - val_loss: 0.6032
 Epoch 23/1000
 12/12 0s 7ms/step -
 accuracy: 0.7176 - loss: 0.6043 - val_accuracy: 0.7094 - val_loss: 0.6029
 Epoch 24/1000
 12/12 0s 7ms/step -
 accuracy: 0.7045 - loss: 0.6132 - val_accuracy: 0.7094 - val_loss: 0.6026
 Epoch 25/1000
 12/12 0s 7ms/step -
 accuracy: 0.7368 - loss: 0.5887 - val_accuracy: 0.7094 - val_loss: 0.6024
 Epoch 26/1000
 12/12 0s 7ms/step -
 accuracy: 0.6984 - loss: 0.6188 - val_accuracy: 0.7094 - val_loss: 0.6021
 Epoch 27/1000
 12/12 0s 7ms/step -

accuracy: 0.7238 - loss: 0.5922 - val_accuracy: 0.7094 - val_loss: 0.6018
 Epoch 28/1000
 12/12 0s 7ms/step -
 accuracy: 0.7082 - loss: 0.6076 - val_accuracy: 0.7094 - val_loss: 0.6015
 Epoch 29/1000
 12/12 0s 7ms/step -
 accuracy: 0.7145 - loss: 0.6010 - val_accuracy: 0.7094 - val_loss: 0.6013
 Epoch 30/1000
 12/12 0s 8ms/step -
 accuracy: 0.6988 - loss: 0.6146 - val_accuracy: 0.7094 - val_loss: 0.6010
 Epoch 31/1000
 12/12 0s 8ms/step -
 accuracy: 0.6870 - loss: 0.6279 - val_accuracy: 0.7094 - val_loss: 0.6008
 Epoch 32/1000
 12/12 0s 7ms/step -
 accuracy: 0.7106 - loss: 0.6066 - val_accuracy: 0.7094 - val_loss: 0.6005
 Epoch 33/1000
 12/12 0s 13ms/step -
 accuracy: 0.6981 - loss: 0.6188 - val_accuracy: 0.7094 - val_loss: 0.6003
 Epoch 34/1000
 12/12 0s 7ms/step -
 accuracy: 0.6934 - loss: 0.6164 - val_accuracy: 0.7094 - val_loss: 0.6000
 Epoch 35/1000
 12/12 0s 7ms/step -
 accuracy: 0.7313 - loss: 0.5879 - val_accuracy: 0.7094 - val_loss: 0.5998
 Epoch 36/1000
 12/12 0s 12ms/step -
 accuracy: 0.7100 - loss: 0.5992 - val_accuracy: 0.7094 - val_loss: 0.5996
 Epoch 37/1000
 12/12 0s 7ms/step -
 accuracy: 0.7118 - loss: 0.6043 - val_accuracy: 0.7094 - val_loss: 0.5993
 Epoch 38/1000
 12/12 0s 7ms/step -
 accuracy: 0.7205 - loss: 0.5903 - val_accuracy: 0.7094 - val_loss: 0.5991
 Epoch 39/1000
 12/12 0s 7ms/step -
 accuracy: 0.6992 - loss: 0.6173 - val_accuracy: 0.7094 - val_loss: 0.5989
 Epoch 40/1000
 12/12 0s 7ms/step -
 accuracy: 0.7395 - loss: 0.5793 - val_accuracy: 0.7094 - val_loss: 0.5986
 Epoch 41/1000
 12/12 0s 7ms/step -
 accuracy: 0.6786 - loss: 0.6347 - val_accuracy: 0.7094 - val_loss: 0.5984
 Epoch 42/1000
 12/12 0s 7ms/step -
 accuracy: 0.7467 - loss: 0.5665 - val_accuracy: 0.7094 - val_loss: 0.5982
 Epoch 43/1000
 12/12 0s 7ms/step -

accuracy: 0.7531 - loss: 0.5646 - val_accuracy: 0.7094 - val_loss: 0.5979
 Epoch 44/1000
 12/12 0s 7ms/step -
 accuracy: 0.7030 - loss: 0.6106 - val_accuracy: 0.7094 - val_loss: 0.5977
 Epoch 45/1000
 12/12 0s 8ms/step -
 accuracy: 0.6805 - loss: 0.6326 - val_accuracy: 0.7094 - val_loss: 0.5975
 Epoch 46/1000
 12/12 0s 7ms/step -
 accuracy: 0.7162 - loss: 0.5968 - val_accuracy: 0.7094 - val_loss: 0.5972
 Epoch 47/1000
 12/12 0s 8ms/step -
 accuracy: 0.6841 - loss: 0.6228 - val_accuracy: 0.7094 - val_loss: 0.5970
 Epoch 48/1000
 12/12 0s 7ms/step -
 accuracy: 0.6966 - loss: 0.6135 - val_accuracy: 0.7094 - val_loss: 0.5968
 Epoch 49/1000
 12/12 0s 7ms/step -
 accuracy: 0.7029 - loss: 0.6105 - val_accuracy: 0.7094 - val_loss: 0.5966
 Epoch 50/1000
 12/12 0s 7ms/step -
 accuracy: 0.7220 - loss: 0.5903 - val_accuracy: 0.7094 - val_loss: 0.5964
 Epoch 51/1000
 12/12 0s 9ms/step -
 accuracy: 0.7252 - loss: 0.5894 - val_accuracy: 0.7094 - val_loss: 0.5962
 Epoch 52/1000
 12/12 0s 7ms/step -
 accuracy: 0.7234 - loss: 0.5901 - val_accuracy: 0.7094 - val_loss: 0.5959
 Epoch 53/1000
 12/12 0s 7ms/step -
 accuracy: 0.7338 - loss: 0.5800 - val_accuracy: 0.7094 - val_loss: 0.5957
 Epoch 54/1000
 12/12 0s 7ms/step -
 accuracy: 0.7046 - loss: 0.6008 - val_accuracy: 0.7094 - val_loss: 0.5955
 Epoch 55/1000
 12/12 0s 6ms/step -
 accuracy: 0.7137 - loss: 0.5982 - val_accuracy: 0.7094 - val_loss: 0.5953
 Epoch 56/1000
 12/12 0s 7ms/step -
 accuracy: 0.7045 - loss: 0.6046 - val_accuracy: 0.7094 - val_loss: 0.5951
 Epoch 57/1000
 12/12 0s 7ms/step -
 accuracy: 0.7008 - loss: 0.6071 - val_accuracy: 0.7094 - val_loss: 0.5949
 Epoch 58/1000
 12/12 0s 7ms/step -
 accuracy: 0.7240 - loss: 0.5848 - val_accuracy: 0.7094 - val_loss: 0.5947
 Epoch 59/1000
 12/12 0s 7ms/step -

accuracy: 0.7242 - loss: 0.5867 - val_accuracy: 0.7094 - val_loss: 0.5944
 Epoch 60/1000
 12/12 0s 7ms/step -
 accuracy: 0.7093 - loss: 0.6007 - val_accuracy: 0.7094 - val_loss: 0.5942
 Epoch 61/1000
 12/12 0s 7ms/step -
 accuracy: 0.7097 - loss: 0.5988 - val_accuracy: 0.7094 - val_loss: 0.5940
 Epoch 62/1000
 12/12 0s 7ms/step -
 accuracy: 0.7098 - loss: 0.6009 - val_accuracy: 0.7094 - val_loss: 0.5938
 Epoch 63/1000
 12/12 0s 7ms/step -
 accuracy: 0.7162 - loss: 0.5935 - val_accuracy: 0.7094 - val_loss: 0.5936
 Epoch 64/1000
 12/12 0s 7ms/step -
 accuracy: 0.7355 - loss: 0.5728 - val_accuracy: 0.7094 - val_loss: 0.5934
 Epoch 65/1000
 12/12 0s 6ms/step -
 accuracy: 0.7234 - loss: 0.5850 - val_accuracy: 0.7094 - val_loss: 0.5932
 Epoch 66/1000
 12/12 0s 7ms/step -
 accuracy: 0.7261 - loss: 0.5825 - val_accuracy: 0.7094 - val_loss: 0.5930
 Epoch 67/1000
 12/12 0s 12ms/step -
 accuracy: 0.7075 - loss: 0.5960 - val_accuracy: 0.7094 - val_loss: 0.5928
 Epoch 68/1000
 12/12 0s 7ms/step -
 accuracy: 0.7193 - loss: 0.5872 - val_accuracy: 0.7094 - val_loss: 0.5926
 Epoch 69/1000
 12/12 0s 7ms/step -
 accuracy: 0.7269 - loss: 0.5806 - val_accuracy: 0.7094 - val_loss: 0.5924
 Epoch 70/1000
 12/12 0s 6ms/step -
 accuracy: 0.7219 - loss: 0.5841 - val_accuracy: 0.7094 - val_loss: 0.5922
 Epoch 71/1000
 12/12 0s 7ms/step -
 accuracy: 0.6982 - loss: 0.6054 - val_accuracy: 0.7094 - val_loss: 0.5920
 Epoch 72/1000
 12/12 0s 7ms/step -
 accuracy: 0.6843 - loss: 0.6166 - val_accuracy: 0.7094 - val_loss: 0.5918
 Epoch 73/1000
 12/12 0s 7ms/step -
 accuracy: 0.7454 - loss: 0.5641 - val_accuracy: 0.7094 - val_loss: 0.5916
 Epoch 74/1000
 12/12 0s 6ms/step -
 accuracy: 0.7087 - loss: 0.5986 - val_accuracy: 0.7094 - val_loss: 0.5914
 Epoch 75/1000
 12/12 0s 7ms/step -

accuracy: 0.7095 - loss: 0.6005 - val_accuracy: 0.7094 - val_loss: 0.5912
 Epoch 76/1000
 12/12 0s 7ms/step -
 accuracy: 0.7326 - loss: 0.5721 - val_accuracy: 0.7094 - val_loss: 0.5911
 Epoch 77/1000
 12/12 0s 7ms/step -
 accuracy: 0.7229 - loss: 0.5812 - val_accuracy: 0.7094 - val_loss: 0.5909
 Epoch 78/1000
 12/12 0s 6ms/step -
 accuracy: 0.6906 - loss: 0.6092 - val_accuracy: 0.7094 - val_loss: 0.5907
 Epoch 79/1000
 12/12 0s 7ms/step -
 accuracy: 0.6888 - loss: 0.6140 - val_accuracy: 0.7094 - val_loss: 0.5905
 Epoch 80/1000
 12/12 0s 6ms/step -
 accuracy: 0.6861 - loss: 0.6137 - val_accuracy: 0.7094 - val_loss: 0.5903
 Epoch 81/1000
 12/12 0s 6ms/step -
 accuracy: 0.7066 - loss: 0.5971 - val_accuracy: 0.7094 - val_loss: 0.5901
 Epoch 82/1000
 12/12 0s 7ms/step -
 accuracy: 0.7322 - loss: 0.5737 - val_accuracy: 0.7094 - val_loss: 0.5899
 Epoch 83/1000
 12/12 0s 6ms/step -
 accuracy: 0.7233 - loss: 0.5786 - val_accuracy: 0.7094 - val_loss: 0.5897
 Epoch 84/1000
 12/12 0s 7ms/step -
 accuracy: 0.6950 - loss: 0.6073 - val_accuracy: 0.7094 - val_loss: 0.5896
 Epoch 85/1000
 12/12 0s 7ms/step -
 accuracy: 0.7235 - loss: 0.5794 - val_accuracy: 0.7094 - val_loss: 0.5894
 Epoch 86/1000
 12/12 0s 7ms/step -
 accuracy: 0.7206 - loss: 0.5869 - val_accuracy: 0.7094 - val_loss: 0.5892
 Epoch 87/1000
 12/12 0s 7ms/step -
 accuracy: 0.7100 - loss: 0.5933 - val_accuracy: 0.7094 - val_loss: 0.5890
 Epoch 88/1000
 12/12 0s 7ms/step -
 accuracy: 0.6734 - loss: 0.6238 - val_accuracy: 0.7094 - val_loss: 0.5888
 Epoch 89/1000
 12/12 0s 12ms/step -
 accuracy: 0.7473 - loss: 0.5595 - val_accuracy: 0.7094 - val_loss: 0.5887
 Epoch 90/1000
 12/12 0s 9ms/step -
 accuracy: 0.7464 - loss: 0.5604 - val_accuracy: 0.7094 - val_loss: 0.5885
 Epoch 91/1000
 12/12 0s 7ms/step -

accuracy: 0.6751 - loss: 0.6249 - val_accuracy: 0.7094 - val_loss: 0.5883
 Epoch 92/1000
 12/12 0s 7ms/step -
 accuracy: 0.7219 - loss: 0.5807 - val_accuracy: 0.7094 - val_loss: 0.5881
 Epoch 93/1000
 12/12 0s 7ms/step -
 accuracy: 0.7137 - loss: 0.5859 - val_accuracy: 0.7094 - val_loss: 0.5879
 Epoch 94/1000
 12/12 0s 7ms/step -
 accuracy: 0.7286 - loss: 0.5735 - val_accuracy: 0.7094 - val_loss: 0.5878
 Epoch 95/1000
 12/12 0s 6ms/step -
 accuracy: 0.7085 - loss: 0.5949 - val_accuracy: 0.7094 - val_loss: 0.5876
 Epoch 96/1000
 12/12 0s 6ms/step -
 accuracy: 0.7054 - loss: 0.5947 - val_accuracy: 0.7094 - val_loss: 0.5874
 Epoch 97/1000
 12/12 0s 8ms/step -
 accuracy: 0.7260 - loss: 0.5759 - val_accuracy: 0.7094 - val_loss: 0.5872
 Epoch 98/1000
 12/12 0s 12ms/step -
 accuracy: 0.6961 - loss: 0.6002 - val_accuracy: 0.7094 - val_loss: 0.5871
 Epoch 99/1000
 12/12 0s 8ms/step -
 accuracy: 0.6964 - loss: 0.6026 - val_accuracy: 0.7094 - val_loss: 0.5869
 Epoch 100/1000
 12/12 0s 7ms/step -
 accuracy: 0.7118 - loss: 0.5894 - val_accuracy: 0.7094 - val_loss: 0.5867
 Epoch 101/1000
 12/12 0s 6ms/step -
 accuracy: 0.7195 - loss: 0.5809 - val_accuracy: 0.7094 - val_loss: 0.5865
 Epoch 102/1000
 12/12 0s 6ms/step -
 accuracy: 0.7435 - loss: 0.5587 - val_accuracy: 0.7094 - val_loss: 0.5864
 Epoch 103/1000
 12/12 0s 6ms/step -
 accuracy: 0.7100 - loss: 0.5879 - val_accuracy: 0.7094 - val_loss: 0.5862
 Epoch 104/1000
 12/12 0s 6ms/step -
 accuracy: 0.7132 - loss: 0.5862 - val_accuracy: 0.7094 - val_loss: 0.5860
 Epoch 105/1000
 12/12 0s 7ms/step -
 accuracy: 0.7142 - loss: 0.5856 - val_accuracy: 0.7094 - val_loss: 0.5859
 Epoch 106/1000
 12/12 0s 6ms/step -
 accuracy: 0.7163 - loss: 0.5830 - val_accuracy: 0.7094 - val_loss: 0.5857
 Epoch 107/1000
 12/12 0s 6ms/step -

accuracy: 0.7173 - loss: 0.5794 - val_accuracy: 0.7094 - val_loss: 0.5855
 Epoch 108/1000
 12/12 0s 6ms/step -
 accuracy: 0.7246 - loss: 0.5757 - val_accuracy: 0.7094 - val_loss: 0.5853
 Epoch 109/1000
 12/12 0s 6ms/step -
 accuracy: 0.7286 - loss: 0.5726 - val_accuracy: 0.7094 - val_loss: 0.5852
 Epoch 110/1000
 12/12 0s 6ms/step -
 accuracy: 0.7454 - loss: 0.5573 - val_accuracy: 0.7094 - val_loss: 0.5850
 Epoch 111/1000
 12/12 0s 8ms/step -
 accuracy: 0.6943 - loss: 0.6056 - val_accuracy: 0.7094 - val_loss: 0.5848
 Epoch 112/1000
 12/12 0s 8ms/step -
 accuracy: 0.7081 - loss: 0.5927 - val_accuracy: 0.7094 - val_loss: 0.5847
 Epoch 113/1000
 12/12 0s 7ms/step -
 accuracy: 0.7201 - loss: 0.5757 - val_accuracy: 0.7094 - val_loss: 0.5845
 Epoch 114/1000
 12/12 0s 6ms/step -
 accuracy: 0.7087 - loss: 0.5874 - val_accuracy: 0.7094 - val_loss: 0.5844
 Epoch 115/1000
 12/12 0s 6ms/step -
 accuracy: 0.7095 - loss: 0.5860 - val_accuracy: 0.7094 - val_loss: 0.5842
 Epoch 116/1000
 12/12 0s 6ms/step -
 accuracy: 0.7089 - loss: 0.5875 - val_accuracy: 0.7094 - val_loss: 0.5840
 Epoch 117/1000
 12/12 0s 6ms/step -
 accuracy: 0.7230 - loss: 0.5765 - val_accuracy: 0.7094 - val_loss: 0.5839
 Epoch 118/1000
 12/12 0s 6ms/step -
 accuracy: 0.7135 - loss: 0.5852 - val_accuracy: 0.7094 - val_loss: 0.5837
 Epoch 119/1000
 12/12 0s 7ms/step -
 accuracy: 0.6989 - loss: 0.5973 - val_accuracy: 0.7094 - val_loss: 0.5836
 Epoch 120/1000
 12/12 0s 9ms/step -
 accuracy: 0.7229 - loss: 0.5740 - val_accuracy: 0.7094 - val_loss: 0.5834
 Epoch 121/1000
 12/12 0s 7ms/step -
 accuracy: 0.6903 - loss: 0.6040 - val_accuracy: 0.7094 - val_loss: 0.5833
 Epoch 122/1000
 12/12 0s 6ms/step -
 accuracy: 0.7216 - loss: 0.5754 - val_accuracy: 0.7094 - val_loss: 0.5831
 Epoch 123/1000
 12/12 0s 8ms/step -

accuracy: 0.7191 - loss: 0.5741 - val_accuracy: 0.7094 - val_loss: 0.5829
 Epoch 124/1000
 12/12 0s 7ms/step -
 accuracy: 0.7225 - loss: 0.5698 - val_accuracy: 0.7094 - val_loss: 0.5828
 Epoch 125/1000
 12/12 0s 7ms/step -
 accuracy: 0.7234 - loss: 0.5709 - val_accuracy: 0.7094 - val_loss: 0.5826
 Epoch 126/1000
 12/12 0s 7ms/step -
 accuracy: 0.7270 - loss: 0.5699 - val_accuracy: 0.7094 - val_loss: 0.5825
 Epoch 127/1000
 12/12 0s 8ms/step -
 accuracy: 0.6772 - loss: 0.6125 - val_accuracy: 0.7094 - val_loss: 0.5823
 Epoch 128/1000
 12/12 0s 7ms/step -
 accuracy: 0.7227 - loss: 0.5742 - val_accuracy: 0.7094 - val_loss: 0.5821
 Epoch 129/1000
 12/12 0s 7ms/step -
 accuracy: 0.7113 - loss: 0.5828 - val_accuracy: 0.7094 - val_loss: 0.5820
 Epoch 130/1000
 12/12 0s 7ms/step -
 accuracy: 0.7237 - loss: 0.5725 - val_accuracy: 0.7094 - val_loss: 0.5818
 Epoch 131/1000
 12/12 0s 9ms/step -
 accuracy: 0.7134 - loss: 0.5804 - val_accuracy: 0.7094 - val_loss: 0.5817
 Epoch 132/1000
 12/12 0s 7ms/step -
 accuracy: 0.7042 - loss: 0.5884 - val_accuracy: 0.7094 - val_loss: 0.5815
 Epoch 133/1000
 12/12 0s 7ms/step -
 accuracy: 0.7303 - loss: 0.5616 - val_accuracy: 0.7094 - val_loss: 0.5813
 Epoch 134/1000
 12/12 0s 7ms/step -
 accuracy: 0.7345 - loss: 0.5634 - val_accuracy: 0.7094 - val_loss: 0.5812
 Epoch 135/1000
 12/12 0s 13ms/step -
 accuracy: 0.7196 - loss: 0.5777 - val_accuracy: 0.7094 - val_loss: 0.5810
 Epoch 136/1000
 12/12 0s 8ms/step -
 accuracy: 0.7221 - loss: 0.5701 - val_accuracy: 0.7094 - val_loss: 0.5809
 Epoch 137/1000
 12/12 0s 7ms/step -
 accuracy: 0.7319 - loss: 0.5620 - val_accuracy: 0.7094 - val_loss: 0.5807
 Epoch 138/1000
 12/12 0s 7ms/step -
 accuracy: 0.7131 - loss: 0.5801 - val_accuracy: 0.7094 - val_loss: 0.5806
 Epoch 139/1000
 12/12 0s 8ms/step -

accuracy: 0.7281 - loss: 0.5683 - val_accuracy: 0.7094 - val_loss: 0.5804
 Epoch 140/1000
 12/12 0s 7ms/step -
 accuracy: 0.7057 - loss: 0.5830 - val_accuracy: 0.7094 - val_loss: 0.5803
 Epoch 141/1000
 12/12 0s 12ms/step -
 accuracy: 0.6950 - loss: 0.5951 - val_accuracy: 0.7094 - val_loss: 0.5801
 Epoch 142/1000
 12/12 0s 8ms/step -
 accuracy: 0.7078 - loss: 0.5838 - val_accuracy: 0.7094 - val_loss: 0.5800
 Epoch 143/1000
 12/12 0s 7ms/step -
 accuracy: 0.7090 - loss: 0.5821 - val_accuracy: 0.7094 - val_loss: 0.5798
 Epoch 144/1000
 12/12 0s 7ms/step -
 accuracy: 0.7147 - loss: 0.5752 - val_accuracy: 0.7094 - val_loss: 0.5797
 Epoch 145/1000
 12/12 0s 7ms/step -
 accuracy: 0.7055 - loss: 0.5843 - val_accuracy: 0.7094 - val_loss: 0.5795
 Epoch 146/1000
 12/12 0s 7ms/step -
 accuracy: 0.7084 - loss: 0.5809 - val_accuracy: 0.7094 - val_loss: 0.5793
 Epoch 147/1000
 12/12 0s 7ms/step -
 accuracy: 0.7233 - loss: 0.5694 - val_accuracy: 0.7094 - val_loss: 0.5792
 Epoch 148/1000
 12/12 0s 12ms/step -
 accuracy: 0.7205 - loss: 0.5749 - val_accuracy: 0.7094 - val_loss: 0.5791
 Epoch 149/1000
 12/12 0s 8ms/step -
 accuracy: 0.7274 - loss: 0.5681 - val_accuracy: 0.7094 - val_loss: 0.5789
 Epoch 150/1000
 12/12 0s 9ms/step -
 accuracy: 0.7199 - loss: 0.5700 - val_accuracy: 0.7094 - val_loss: 0.5787
 Epoch 151/1000
 12/12 0s 8ms/step -
 accuracy: 0.7231 - loss: 0.5678 - val_accuracy: 0.7094 - val_loss: 0.5786
 Epoch 152/1000
 12/12 0s 8ms/step -
 accuracy: 0.7371 - loss: 0.5543 - val_accuracy: 0.7094 - val_loss: 0.5784
 Epoch 153/1000
 12/12 0s 8ms/step -
 accuracy: 0.7121 - loss: 0.5781 - val_accuracy: 0.7094 - val_loss: 0.5783
 Epoch 154/1000
 12/12 0s 7ms/step -
 accuracy: 0.6981 - loss: 0.5935 - val_accuracy: 0.7094 - val_loss: 0.5782
 Epoch 155/1000
 12/12 0s 7ms/step -

accuracy: 0.7262 - loss: 0.5636 - val_accuracy: 0.7094 - val_loss: 0.5780
 Epoch 156/1000
 12/12 0s 7ms/step -
 accuracy: 0.7106 - loss: 0.5819 - val_accuracy: 0.7094 - val_loss: 0.5779
 Epoch 157/1000
 12/12 0s 8ms/step -
 accuracy: 0.7459 - loss: 0.5478 - val_accuracy: 0.7094 - val_loss: 0.5777
 Epoch 158/1000
 12/12 0s 8ms/step -
 accuracy: 0.7166 - loss: 0.5715 - val_accuracy: 0.7094 - val_loss: 0.5776
 Epoch 159/1000
 12/12 0s 14ms/step -
 accuracy: 0.7189 - loss: 0.5696 - val_accuracy: 0.7094 - val_loss: 0.5775
 Epoch 160/1000
 12/12 0s 7ms/step -
 accuracy: 0.7096 - loss: 0.5794 - val_accuracy: 0.7094 - val_loss: 0.5773
 Epoch 161/1000
 12/12 0s 7ms/step -
 accuracy: 0.7477 - loss: 0.5423 - val_accuracy: 0.7094 - val_loss: 0.5772
 Epoch 162/1000
 12/12 0s 6ms/step -
 accuracy: 0.7004 - loss: 0.5820 - val_accuracy: 0.7094 - val_loss: 0.5770
 Epoch 163/1000
 12/12 0s 6ms/step -
 accuracy: 0.7494 - loss: 0.5440 - val_accuracy: 0.7094 - val_loss: 0.5769
 Epoch 164/1000
 12/12 0s 6ms/step -
 accuracy: 0.7047 - loss: 0.5830 - val_accuracy: 0.7094 - val_loss: 0.5768
 Epoch 165/1000
 12/12 0s 6ms/step -
 accuracy: 0.7283 - loss: 0.5620 - val_accuracy: 0.7094 - val_loss: 0.5766
 Epoch 166/1000
 12/12 0s 6ms/step -
 accuracy: 0.7218 - loss: 0.5651 - val_accuracy: 0.7094 - val_loss: 0.5765
 Epoch 167/1000
 12/12 0s 7ms/step -
 accuracy: 0.7266 - loss: 0.5651 - val_accuracy: 0.7094 - val_loss: 0.5763
 Epoch 168/1000
 12/12 0s 6ms/step -
 accuracy: 0.7243 - loss: 0.5642 - val_accuracy: 0.7094 - val_loss: 0.5762
 Epoch 169/1000
 12/12 0s 12ms/step -
 accuracy: 0.7007 - loss: 0.5846 - val_accuracy: 0.7094 - val_loss: 0.5760
 Epoch 170/1000
 12/12 0s 9ms/step -
 accuracy: 0.6956 - loss: 0.5903 - val_accuracy: 0.7094 - val_loss: 0.5759
 Epoch 171/1000
 12/12 0s 8ms/step -

accuracy: 0.7015 - loss: 0.5864 - val_accuracy: 0.7094 - val_loss: 0.5758
 Epoch 172/1000
 12/12 0s 7ms/step -
 accuracy: 0.7429 - loss: 0.5492 - val_accuracy: 0.7094 - val_loss: 0.5756
 Epoch 173/1000
 12/12 0s 7ms/step -
 accuracy: 0.6619 - loss: 0.6174 - val_accuracy: 0.7094 - val_loss: 0.5755
 Epoch 174/1000
 12/12 0s 7ms/step -
 accuracy: 0.7190 - loss: 0.5686 - val_accuracy: 0.7094 - val_loss: 0.5754
 Epoch 175/1000
 12/12 0s 7ms/step -
 accuracy: 0.7193 - loss: 0.5653 - val_accuracy: 0.7094 - val_loss: 0.5752
 Epoch 176/1000
 12/12 0s 8ms/step -
 accuracy: 0.6988 - loss: 0.5865 - val_accuracy: 0.7094 - val_loss: 0.5751
 Epoch 177/1000
 12/12 0s 7ms/step -
 accuracy: 0.7158 - loss: 0.5692 - val_accuracy: 0.7094 - val_loss: 0.5750
 Epoch 178/1000
 12/12 0s 8ms/step -
 accuracy: 0.7248 - loss: 0.5621 - val_accuracy: 0.7094 - val_loss: 0.5748
 Epoch 179/1000
 12/12 0s 9ms/step -
 accuracy: 0.7163 - loss: 0.5644 - val_accuracy: 0.7094 - val_loss: 0.5747
 Epoch 180/1000
 12/12 0s 9ms/step -
 accuracy: 0.7260 - loss: 0.5653 - val_accuracy: 0.7094 - val_loss: 0.5745
 Epoch 181/1000
 12/12 0s 9ms/step -
 accuracy: 0.7238 - loss: 0.5645 - val_accuracy: 0.7094 - val_loss: 0.5744
 Epoch 182/1000
 12/12 0s 8ms/step -
 accuracy: 0.6805 - loss: 0.5932 - val_accuracy: 0.7094 - val_loss: 0.5743
 Epoch 183/1000
 12/12 0s 9ms/step -
 accuracy: 0.7066 - loss: 0.5724 - val_accuracy: 0.7094 - val_loss: 0.5741
 Epoch 184/1000
 12/12 0s 7ms/step -
 accuracy: 0.7240 - loss: 0.5670 - val_accuracy: 0.7094 - val_loss: 0.5740
 Epoch 185/1000
 12/12 0s 7ms/step -
 accuracy: 0.7173 - loss: 0.5701 - val_accuracy: 0.7094 - val_loss: 0.5739
 Epoch 186/1000
 12/12 0s 6ms/step -
 accuracy: 0.7163 - loss: 0.5728 - val_accuracy: 0.7094 - val_loss: 0.5737
 Epoch 187/1000
 12/12 0s 8ms/step -

accuracy: 0.6746 - loss: 0.6062 - val_accuracy: 0.7094 - val_loss: 0.5736
 Epoch 188/1000
 12/12 0s 7ms/step -
 accuracy: 0.7045 - loss: 0.5792 - val_accuracy: 0.7094 - val_loss: 0.5735
 Epoch 189/1000
 12/12 0s 6ms/step -
 accuracy: 0.7281 - loss: 0.5596 - val_accuracy: 0.7094 - val_loss: 0.5734
 Epoch 190/1000
 12/12 0s 6ms/step -
 accuracy: 0.6864 - loss: 0.5958 - val_accuracy: 0.7094 - val_loss: 0.5732
 Epoch 191/1000
 12/12 0s 6ms/step -
 accuracy: 0.7135 - loss: 0.5706 - val_accuracy: 0.7094 - val_loss: 0.5731
 Epoch 192/1000
 12/12 0s 6ms/step -
 accuracy: 0.7382 - loss: 0.5489 - val_accuracy: 0.7094 - val_loss: 0.5730
 Epoch 193/1000
 12/12 0s 6ms/step -
 accuracy: 0.7399 - loss: 0.5504 - val_accuracy: 0.7094 - val_loss: 0.5728
 Epoch 194/1000
 12/12 0s 6ms/step -
 accuracy: 0.7188 - loss: 0.5675 - val_accuracy: 0.7094 - val_loss: 0.5727
 Epoch 195/1000
 12/12 0s 6ms/step -
 accuracy: 0.7170 - loss: 0.5658 - val_accuracy: 0.7094 - val_loss: 0.5726
 Epoch 196/1000
 12/12 0s 7ms/step -
 accuracy: 0.7235 - loss: 0.5549 - val_accuracy: 0.7094 - val_loss: 0.5725
 Epoch 197/1000
 12/12 0s 7ms/step -
 accuracy: 0.7380 - loss: 0.5462 - val_accuracy: 0.7094 - val_loss: 0.5723
 Epoch 198/1000
 12/12 0s 7ms/step -
 accuracy: 0.6881 - loss: 0.5940 - val_accuracy: 0.7094 - val_loss: 0.5722
 Epoch 199/1000
 12/12 0s 7ms/step -
 accuracy: 0.7000 - loss: 0.5789 - val_accuracy: 0.7094 - val_loss: 0.5721
 Epoch 200/1000
 12/12 0s 6ms/step -
 accuracy: 0.7193 - loss: 0.5675 - val_accuracy: 0.7094 - val_loss: 0.5719
 Epoch 201/1000
 12/12 0s 7ms/step -
 accuracy: 0.7154 - loss: 0.5661 - val_accuracy: 0.7094 - val_loss: 0.5718
 Epoch 202/1000
 12/12 0s 7ms/step -
 accuracy: 0.6902 - loss: 0.5807 - val_accuracy: 0.7094 - val_loss: 0.5717
 Epoch 203/1000
 12/12 0s 7ms/step -

accuracy: 0.7054 - loss: 0.5763 - val_accuracy: 0.7094 - val_loss: 0.5716
 Epoch 204/1000
 12/12 0s 7ms/step -
 accuracy: 0.7159 - loss: 0.5705 - val_accuracy: 0.7094 - val_loss: 0.5714
 Epoch 205/1000
 12/12 0s 6ms/step -
 accuracy: 0.7045 - loss: 0.5710 - val_accuracy: 0.7094 - val_loss: 0.5713
 Epoch 206/1000
 12/12 0s 6ms/step -
 accuracy: 0.7155 - loss: 0.5669 - val_accuracy: 0.7094 - val_loss: 0.5712
 Epoch 207/1000
 12/12 0s 6ms/step -
 accuracy: 0.7112 - loss: 0.5669 - val_accuracy: 0.7094 - val_loss: 0.5711
 Epoch 208/1000
 12/12 0s 6ms/step -
 accuracy: 0.6997 - loss: 0.5782 - val_accuracy: 0.7094 - val_loss: 0.5709
 Epoch 209/1000
 12/12 0s 7ms/step -
 accuracy: 0.6950 - loss: 0.5842 - val_accuracy: 0.7094 - val_loss: 0.5708
 Epoch 210/1000
 12/12 0s 7ms/step -
 accuracy: 0.7019 - loss: 0.5793 - val_accuracy: 0.7094 - val_loss: 0.5707
 Epoch 211/1000
 12/12 0s 7ms/step -
 accuracy: 0.7254 - loss: 0.5569 - val_accuracy: 0.7094 - val_loss: 0.5706
 Epoch 212/1000
 12/12 0s 7ms/step -
 accuracy: 0.7432 - loss: 0.5433 - val_accuracy: 0.7094 - val_loss: 0.5704
 Epoch 213/1000
 12/12 0s 7ms/step -
 accuracy: 0.7361 - loss: 0.5497 - val_accuracy: 0.7094 - val_loss: 0.5703
 Epoch 214/1000
 12/12 0s 13ms/step -
 accuracy: 0.7262 - loss: 0.5594 - val_accuracy: 0.7094 - val_loss: 0.5702
 Epoch 215/1000
 12/12 0s 7ms/step -
 accuracy: 0.7126 - loss: 0.5707 - val_accuracy: 0.7094 - val_loss: 0.5701
 Epoch 216/1000
 12/12 0s 7ms/step -
 accuracy: 0.7485 - loss: 0.5406 - val_accuracy: 0.7094 - val_loss: 0.5699
 Epoch 217/1000
 12/12 0s 9ms/step -
 accuracy: 0.7106 - loss: 0.5694 - val_accuracy: 0.7094 - val_loss: 0.5698
 Epoch 218/1000
 12/12 0s 8ms/step -
 accuracy: 0.6935 - loss: 0.5834 - val_accuracy: 0.7094 - val_loss: 0.5697
 Epoch 219/1000
 12/12 0s 8ms/step -

accuracy: 0.7217 - loss: 0.5555 - val_accuracy: 0.7094 - val_loss: 0.5696
 Epoch 220/1000
 12/12 0s 8ms/step -
 accuracy: 0.7248 - loss: 0.5532 - val_accuracy: 0.7094 - val_loss: 0.5694
 Epoch 221/1000
 12/12 0s 7ms/step -
 accuracy: 0.6989 - loss: 0.5799 - val_accuracy: 0.7094 - val_loss: 0.5693
 Epoch 222/1000
 12/12 0s 8ms/step -
 accuracy: 0.6861 - loss: 0.5858 - val_accuracy: 0.7094 - val_loss: 0.5692
 Epoch 223/1000
 12/12 0s 13ms/step -
 accuracy: 0.7057 - loss: 0.5699 - val_accuracy: 0.7094 - val_loss: 0.5691
 Epoch 224/1000
 12/12 0s 9ms/step -
 accuracy: 0.7154 - loss: 0.5674 - val_accuracy: 0.7094 - val_loss: 0.5689
 Epoch 225/1000
 12/12 0s 9ms/step -
 accuracy: 0.7201 - loss: 0.5575 - val_accuracy: 0.7094 - val_loss: 0.5688
 Epoch 226/1000
 12/12 0s 8ms/step -
 accuracy: 0.6756 - loss: 0.5906 - val_accuracy: 0.7094 - val_loss: 0.5687
 Epoch 227/1000
 12/12 0s 8ms/step -
 accuracy: 0.7130 - loss: 0.5660 - val_accuracy: 0.7094 - val_loss: 0.5686
 Epoch 228/1000
 12/12 0s 13ms/step -
 accuracy: 0.7261 - loss: 0.5578 - val_accuracy: 0.7094 - val_loss: 0.5684
 Epoch 229/1000
 12/12 0s 9ms/step -
 accuracy: 0.7168 - loss: 0.5650 - val_accuracy: 0.7094 - val_loss: 0.5683
 Epoch 230/1000
 12/12 0s 7ms/step -
 accuracy: 0.7372 - loss: 0.5468 - val_accuracy: 0.7094 - val_loss: 0.5682
 Epoch 231/1000
 12/12 0s 14ms/step -
 accuracy: 0.7116 - loss: 0.5743 - val_accuracy: 0.7094 - val_loss: 0.5681
 Epoch 232/1000
 12/12 0s 8ms/step -
 accuracy: 0.7147 - loss: 0.5627 - val_accuracy: 0.7094 - val_loss: 0.5680
 Epoch 233/1000
 12/12 0s 8ms/step -
 accuracy: 0.7417 - loss: 0.5418 - val_accuracy: 0.7094 - val_loss: 0.5679
 Epoch 234/1000
 12/12 0s 8ms/step -
 accuracy: 0.7222 - loss: 0.5537 - val_accuracy: 0.7094 - val_loss: 0.5677
 Epoch 235/1000
 12/12 0s 8ms/step -

accuracy: 0.7146 - loss: 0.5631 - val_accuracy: 0.7094 - val_loss: 0.5676
 Epoch 236/1000
 12/12 0s 7ms/step -
 accuracy: 0.7133 - loss: 0.5662 - val_accuracy: 0.7094 - val_loss: 0.5675
 Epoch 237/1000
 12/12 0s 7ms/step -
 accuracy: 0.7065 - loss: 0.5662 - val_accuracy: 0.7094 - val_loss: 0.5674
 Epoch 238/1000
 12/12 0s 7ms/step -
 accuracy: 0.7256 - loss: 0.5570 - val_accuracy: 0.7094 - val_loss: 0.5673
 Epoch 239/1000
 12/12 0s 11ms/step -
 accuracy: 0.7029 - loss: 0.5756 - val_accuracy: 0.7094 - val_loss: 0.5672
 Epoch 240/1000
 12/12 0s 8ms/step -
 accuracy: 0.7156 - loss: 0.5581 - val_accuracy: 0.7094 - val_loss: 0.5671
 Epoch 241/1000
 12/12 0s 8ms/step -
 accuracy: 0.7235 - loss: 0.5570 - val_accuracy: 0.7094 - val_loss: 0.5670
 Epoch 242/1000
 12/12 0s 8ms/step -
 accuracy: 0.7117 - loss: 0.5629 - val_accuracy: 0.7094 - val_loss: 0.5669
 Epoch 243/1000
 12/12 0s 8ms/step -
 accuracy: 0.7242 - loss: 0.5584 - val_accuracy: 0.7094 - val_loss: 0.5667
 Epoch 244/1000
 12/12 0s 8ms/step -
 accuracy: 0.6807 - loss: 0.5911 - val_accuracy: 0.7094 - val_loss: 0.5667
 Epoch 245/1000
 12/12 0s 7ms/step -
 accuracy: 0.7147 - loss: 0.5622 - val_accuracy: 0.7094 - val_loss: 0.5666
 Epoch 246/1000
 12/12 0s 11ms/step -
 accuracy: 0.6989 - loss: 0.5765 - val_accuracy: 0.7094 - val_loss: 0.5665
 Epoch 247/1000
 12/12 0s 11ms/step -
 accuracy: 0.6834 - loss: 0.5907 - val_accuracy: 0.7094 - val_loss: 0.5664
 Epoch 248/1000
 12/12 0s 8ms/step -
 accuracy: 0.6986 - loss: 0.5720 - val_accuracy: 0.7094 - val_loss: 0.5662
 Epoch 249/1000
 12/12 0s 9ms/step -
 accuracy: 0.7290 - loss: 0.5517 - val_accuracy: 0.7094 - val_loss: 0.5661
 Epoch 250/1000
 12/12 0s 8ms/step -
 accuracy: 0.7045 - loss: 0.5694 - val_accuracy: 0.7094 - val_loss: 0.5660
 Epoch 251/1000
 12/12 0s 7ms/step -

accuracy: 0.7361 - loss: 0.5413 - val_accuracy: 0.7094 - val_loss: 0.5658
 Epoch 252/1000
 12/12 0s 7ms/step -
 accuracy: 0.7239 - loss: 0.5538 - val_accuracy: 0.7094 - val_loss: 0.5657
 Epoch 253/1000
 12/12 0s 7ms/step -
 accuracy: 0.7153 - loss: 0.5675 - val_accuracy: 0.7094 - val_loss: 0.5657
 Epoch 254/1000
 12/12 0s 13ms/step -
 accuracy: 0.7416 - loss: 0.5364 - val_accuracy: 0.7094 - val_loss: 0.5655
 Epoch 255/1000
 12/12 0s 8ms/step -
 accuracy: 0.7430 - loss: 0.5380 - val_accuracy: 0.7094 - val_loss: 0.5654
 Epoch 256/1000
 12/12 0s 8ms/step -
 accuracy: 0.7500 - loss: 0.5325 - val_accuracy: 0.7094 - val_loss: 0.5653
 Epoch 257/1000
 12/12 0s 7ms/step -
 accuracy: 0.7203 - loss: 0.5492 - val_accuracy: 0.7094 - val_loss: 0.5652
 Epoch 258/1000
 12/12 0s 8ms/step -
 accuracy: 0.7170 - loss: 0.5574 - val_accuracy: 0.7094 - val_loss: 0.5651
 Epoch 259/1000
 12/12 0s 7ms/step -
 accuracy: 0.7273 - loss: 0.5465 - val_accuracy: 0.7094 - val_loss: 0.5650
 Epoch 260/1000
 12/12 0s 8ms/step -
 accuracy: 0.7236 - loss: 0.5560 - val_accuracy: 0.7094 - val_loss: 0.5649
 Epoch 261/1000
 12/12 0s 18ms/step -
 accuracy: 0.7091 - loss: 0.5654 - val_accuracy: 0.7094 - val_loss: 0.5648
 Epoch 262/1000
 12/12 0s 8ms/step -
 accuracy: 0.6998 - loss: 0.5740 - val_accuracy: 0.7094 - val_loss: 0.5647
 Epoch 263/1000
 12/12 0s 7ms/step -
 accuracy: 0.7144 - loss: 0.5522 - val_accuracy: 0.7094 - val_loss: 0.5646
 Epoch 264/1000
 12/12 0s 8ms/step -
 accuracy: 0.7114 - loss: 0.5653 - val_accuracy: 0.7094 - val_loss: 0.5645
 Epoch 265/1000
 12/12 0s 8ms/step -
 accuracy: 0.7093 - loss: 0.5635 - val_accuracy: 0.7094 - val_loss: 0.5644
 Epoch 266/1000
 12/12 0s 7ms/step -
 accuracy: 0.7107 - loss: 0.5573 - val_accuracy: 0.7094 - val_loss: 0.5643
 Epoch 267/1000
 12/12 0s 7ms/step -

accuracy: 0.7056 - loss: 0.5617 - val_accuracy: 0.7094 - val_loss: 0.5642
 Epoch 268/1000
 12/12 0s 11ms/step -
 accuracy: 0.7274 - loss: 0.5449 - val_accuracy: 0.7094 - val_loss: 0.5641
 Epoch 269/1000
 12/12 0s 8ms/step -
 accuracy: 0.7284 - loss: 0.5444 - val_accuracy: 0.7094 - val_loss: 0.5640
 Epoch 270/1000
 12/12 0s 7ms/step -
 accuracy: 0.7170 - loss: 0.5673 - val_accuracy: 0.7094 - val_loss: 0.5639
 Epoch 271/1000
 12/12 0s 7ms/step -
 accuracy: 0.7182 - loss: 0.5507 - val_accuracy: 0.7094 - val_loss: 0.5637
 Epoch 272/1000
 12/12 0s 7ms/step -
 accuracy: 0.6787 - loss: 0.5789 - val_accuracy: 0.7094 - val_loss: 0.5636
 Epoch 273/1000
 12/12 0s 7ms/step -
 accuracy: 0.7046 - loss: 0.5671 - val_accuracy: 0.7094 - val_loss: 0.5635
 Epoch 274/1000
 12/12 0s 8ms/step -
 accuracy: 0.7391 - loss: 0.5406 - val_accuracy: 0.7094 - val_loss: 0.5634
 Epoch 275/1000
 12/12 0s 7ms/step -
 accuracy: 0.6896 - loss: 0.5809 - val_accuracy: 0.7094 - val_loss: 0.5633
 Epoch 276/1000
 12/12 0s 15ms/step -
 accuracy: 0.7019 - loss: 0.5777 - val_accuracy: 0.7094 - val_loss: 0.5632
 Epoch 277/1000
 12/12 0s 7ms/step -
 accuracy: 0.7146 - loss: 0.5601 - val_accuracy: 0.7094 - val_loss: 0.5631
 Epoch 278/1000
 12/12 0s 7ms/step -
 accuracy: 0.7300 - loss: 0.5454 - val_accuracy: 0.7094 - val_loss: 0.5630
 Epoch 279/1000
 12/12 0s 6ms/step -
 accuracy: 0.7064 - loss: 0.5660 - val_accuracy: 0.7094 - val_loss: 0.5630
 Epoch 280/1000
 12/12 0s 6ms/step -
 accuracy: 0.7305 - loss: 0.5451 - val_accuracy: 0.7094 - val_loss: 0.5629
 Epoch 281/1000
 12/12 0s 6ms/step -
 accuracy: 0.7087 - loss: 0.5594 - val_accuracy: 0.7094 - val_loss: 0.5627
 Epoch 282/1000
 12/12 0s 6ms/step -
 accuracy: 0.7029 - loss: 0.5636 - val_accuracy: 0.7094 - val_loss: 0.5627
 Epoch 283/1000
 12/12 0s 6ms/step -

accuracy: 0.7471 - loss: 0.5350 - val_accuracy: 0.7094 - val_loss: 0.5625
 Epoch 284/1000
 12/12 0s 6ms/step -
 accuracy: 0.7370 - loss: 0.5270 - val_accuracy: 0.7094 - val_loss: 0.5624
 Epoch 285/1000
 12/12 0s 6ms/step -
 accuracy: 0.7214 - loss: 0.5526 - val_accuracy: 0.7094 - val_loss: 0.5624
 Epoch 286/1000
 12/12 0s 7ms/step -
 accuracy: 0.7068 - loss: 0.5603 - val_accuracy: 0.7094 - val_loss: 0.5623
 Epoch 287/1000
 12/12 0s 7ms/step -
 accuracy: 0.6755 - loss: 0.5923 - val_accuracy: 0.7094 - val_loss: 0.5622
 Epoch 288/1000
 12/12 0s 6ms/step -
 accuracy: 0.6848 - loss: 0.5786 - val_accuracy: 0.7094 - val_loss: 0.5621
 Epoch 289/1000
 12/12 0s 6ms/step -
 accuracy: 0.7422 - loss: 0.5303 - val_accuracy: 0.7094 - val_loss: 0.5620
 Epoch 290/1000
 12/12 0s 6ms/step -
 accuracy: 0.7236 - loss: 0.5501 - val_accuracy: 0.7094 - val_loss: 0.5619
 Epoch 291/1000
 12/12 0s 6ms/step -
 accuracy: 0.6992 - loss: 0.5682 - val_accuracy: 0.7094 - val_loss: 0.5618
 Epoch 292/1000
 12/12 0s 6ms/step -
 accuracy: 0.7143 - loss: 0.5616 - val_accuracy: 0.7094 - val_loss: 0.5617
 Epoch 293/1000
 12/12 0s 6ms/step -
 accuracy: 0.7142 - loss: 0.5539 - val_accuracy: 0.7094 - val_loss: 0.5616
 Epoch 294/1000
 12/12 0s 6ms/step -
 accuracy: 0.7178 - loss: 0.5539 - val_accuracy: 0.7094 - val_loss: 0.5615
 Epoch 295/1000
 12/12 0s 6ms/step -
 accuracy: 0.7332 - loss: 0.5441 - val_accuracy: 0.7094 - val_loss: 0.5614
 Epoch 296/1000
 12/12 0s 6ms/step -
 accuracy: 0.7208 - loss: 0.5515 - val_accuracy: 0.7094 - val_loss: 0.5613
 Epoch 297/1000
 12/12 0s 7ms/step -
 accuracy: 0.7078 - loss: 0.5607 - val_accuracy: 0.7094 - val_loss: 0.5612
 Epoch 298/1000
 12/12 0s 6ms/step -
 accuracy: 0.7058 - loss: 0.5630 - val_accuracy: 0.7094 - val_loss: 0.5611
 Epoch 299/1000
 12/12 0s 10ms/step -

accuracy: 0.7319 - loss: 0.5484 - val_accuracy: 0.7094 - val_loss: 0.5610
 Epoch 300/1000
 12/12 0s 7ms/step -
 accuracy: 0.7116 - loss: 0.5548 - val_accuracy: 0.7094 - val_loss: 0.5609
 Epoch 301/1000
 12/12 0s 7ms/step -
 accuracy: 0.7327 - loss: 0.5369 - val_accuracy: 0.7094 - val_loss: 0.5608
 Epoch 302/1000
 12/12 0s 6ms/step -
 accuracy: 0.6860 - loss: 0.5744 - val_accuracy: 0.7094 - val_loss: 0.5607
 Epoch 303/1000
 12/12 0s 6ms/step -
 accuracy: 0.7595 - loss: 0.5228 - val_accuracy: 0.7094 - val_loss: 0.5606
 Epoch 304/1000
 12/12 0s 6ms/step -
 accuracy: 0.6887 - loss: 0.5764 - val_accuracy: 0.7094 - val_loss: 0.5605
 Epoch 305/1000
 12/12 0s 6ms/step -
 accuracy: 0.7110 - loss: 0.5513 - val_accuracy: 0.7094 - val_loss: 0.5605
 Epoch 306/1000
 12/12 0s 6ms/step -
 accuracy: 0.6922 - loss: 0.5696 - val_accuracy: 0.7094 - val_loss: 0.5604
 Epoch 307/1000
 12/12 0s 6ms/step -
 accuracy: 0.7158 - loss: 0.5522 - val_accuracy: 0.7094 - val_loss: 0.5603
 Epoch 308/1000
 12/12 0s 6ms/step -
 accuracy: 0.6975 - loss: 0.5673 - val_accuracy: 0.7094 - val_loss: 0.5602
 Epoch 309/1000
 12/12 0s 6ms/step -
 accuracy: 0.7173 - loss: 0.5557 - val_accuracy: 0.7094 - val_loss: 0.5601
 Epoch 310/1000
 12/12 0s 7ms/step -
 accuracy: 0.7015 - loss: 0.5715 - val_accuracy: 0.7094 - val_loss: 0.5601
 Epoch 311/1000
 12/12 0s 6ms/step -
 accuracy: 0.7382 - loss: 0.5394 - val_accuracy: 0.7094 - val_loss: 0.5600
 Epoch 312/1000
 12/12 0s 6ms/step -
 accuracy: 0.7325 - loss: 0.5433 - val_accuracy: 0.7094 - val_loss: 0.5599
 Epoch 313/1000
 12/12 0s 6ms/step -
 accuracy: 0.6789 - loss: 0.5840 - val_accuracy: 0.7094 - val_loss: 0.5598
 Epoch 314/1000
 12/12 0s 6ms/step -
 accuracy: 0.7301 - loss: 0.5450 - val_accuracy: 0.7094 - val_loss: 0.5597
 Epoch 315/1000
 12/12 0s 6ms/step -

accuracy: 0.7052 - loss: 0.5615 - val_accuracy: 0.7094 - val_loss: 0.5597
 Epoch 316/1000
 12/12 0s 6ms/step -
 accuracy: 0.7198 - loss: 0.5497 - val_accuracy: 0.7094 - val_loss: 0.5596
 Epoch 317/1000
 12/12 0s 6ms/step -
 accuracy: 0.7112 - loss: 0.5566 - val_accuracy: 0.7094 - val_loss: 0.5595
 Epoch 318/1000
 12/12 0s 6ms/step -
 accuracy: 0.7233 - loss: 0.5448 - val_accuracy: 0.7094 - val_loss: 0.5594
 Epoch 319/1000
 12/12 0s 6ms/step -
 accuracy: 0.7228 - loss: 0.5460 - val_accuracy: 0.7094 - val_loss: 0.5593
 Epoch 320/1000
 12/12 0s 11ms/step -
 accuracy: 0.7081 - loss: 0.5623 - val_accuracy: 0.7094 - val_loss: 0.5593
 Epoch 321/1000
 12/12 0s 7ms/step -
 accuracy: 0.7123 - loss: 0.5499 - val_accuracy: 0.7094 - val_loss: 0.5592
 Epoch 322/1000
 12/12 0s 6ms/step -
 accuracy: 0.7258 - loss: 0.5422 - val_accuracy: 0.7094 - val_loss: 0.5591
 Epoch 323/1000
 12/12 0s 6ms/step -
 accuracy: 0.7238 - loss: 0.5427 - val_accuracy: 0.7094 - val_loss: 0.5590
 Epoch 324/1000
 12/12 0s 6ms/step -
 accuracy: 0.7001 - loss: 0.5613 - val_accuracy: 0.7094 - val_loss: 0.5589
 Epoch 325/1000
 12/12 0s 6ms/step -
 accuracy: 0.6986 - loss: 0.5677 - val_accuracy: 0.7094 - val_loss: 0.5589
 Epoch 326/1000
 12/12 0s 6ms/step -
 accuracy: 0.7232 - loss: 0.5446 - val_accuracy: 0.7094 - val_loss: 0.5588
 Epoch 327/1000
 12/12 0s 6ms/step -
 accuracy: 0.7339 - loss: 0.5332 - val_accuracy: 0.7094 - val_loss: 0.5586
 Epoch 328/1000
 12/12 0s 6ms/step -
 accuracy: 0.7180 - loss: 0.5474 - val_accuracy: 0.7094 - val_loss: 0.5585
 Epoch 329/1000
 12/12 0s 7ms/step -
 accuracy: 0.6797 - loss: 0.5830 - val_accuracy: 0.7094 - val_loss: 0.5585
 Epoch 330/1000
 12/12 0s 7ms/step -
 accuracy: 0.7272 - loss: 0.5336 - val_accuracy: 0.7094 - val_loss: 0.5584
 Epoch 331/1000
 12/12 0s 7ms/step -

accuracy: 0.7133 - loss: 0.5574 - val_accuracy: 0.7094 - val_loss: 0.5583
 Epoch 332/1000
 12/12 0s 6ms/step -
 accuracy: 0.7052 - loss: 0.5594 - val_accuracy: 0.7094 - val_loss: 0.5583
 Epoch 333/1000
 12/12 0s 7ms/step -
 accuracy: 0.7323 - loss: 0.5294 - val_accuracy: 0.7094 - val_loss: 0.5582
 Epoch 334/1000
 12/12 0s 9ms/step -
 accuracy: 0.6867 - loss: 0.5711 - val_accuracy: 0.7094 - val_loss: 0.5581
 Epoch 335/1000
 12/12 0s 7ms/step -
 accuracy: 0.7159 - loss: 0.5544 - val_accuracy: 0.7094 - val_loss: 0.5580
 Epoch 336/1000
 12/12 0s 7ms/step -
 accuracy: 0.7274 - loss: 0.5417 - val_accuracy: 0.7094 - val_loss: 0.5579
 Epoch 337/1000
 12/12 0s 6ms/step -
 accuracy: 0.7099 - loss: 0.5463 - val_accuracy: 0.7094 - val_loss: 0.5578
 Epoch 338/1000
 12/12 0s 7ms/step -
 accuracy: 0.7175 - loss: 0.5461 - val_accuracy: 0.7094 - val_loss: 0.5577
 Epoch 339/1000
 12/12 0s 7ms/step -
 accuracy: 0.7273 - loss: 0.5444 - val_accuracy: 0.7094 - val_loss: 0.5576
 Epoch 340/1000
 12/12 0s 7ms/step -
 accuracy: 0.7160 - loss: 0.5481 - val_accuracy: 0.7094 - val_loss: 0.5576
 Epoch 341/1000
 12/12 0s 6ms/step -
 accuracy: 0.7041 - loss: 0.5528 - val_accuracy: 0.7094 - val_loss: 0.5575
 Epoch 342/1000
 12/12 0s 6ms/step -
 accuracy: 0.7183 - loss: 0.5357 - val_accuracy: 0.7094 - val_loss: 0.5574
 Epoch 343/1000
 12/12 0s 6ms/step -
 accuracy: 0.7113 - loss: 0.5550 - val_accuracy: 0.7094 - val_loss: 0.5573
 Epoch 344/1000
 12/12 0s 6ms/step -
 accuracy: 0.7157 - loss: 0.5493 - val_accuracy: 0.7094 - val_loss: 0.5572
 Epoch 345/1000
 12/12 0s 6ms/step -
 accuracy: 0.6990 - loss: 0.5574 - val_accuracy: 0.7094 - val_loss: 0.5572
 Epoch 346/1000
 12/12 0s 6ms/step -
 accuracy: 0.6991 - loss: 0.5563 - val_accuracy: 0.7094 - val_loss: 0.5571
 Epoch 347/1000
 12/12 0s 6ms/step -

accuracy: 0.7186 - loss: 0.5443 - val_accuracy: 0.7094 - val_loss: 0.5570
 Epoch 348/1000
 12/12 0s 6ms/step -
 accuracy: 0.7144 - loss: 0.5466 - val_accuracy: 0.7094 - val_loss: 0.5570
 Epoch 349/1000
 12/12 0s 6ms/step -
 accuracy: 0.7065 - loss: 0.5622 - val_accuracy: 0.7094 - val_loss: 0.5569
 Epoch 350/1000
 12/12 0s 6ms/step -
 accuracy: 0.6634 - loss: 0.5934 - val_accuracy: 0.7094 - val_loss: 0.5568
 Epoch 351/1000
 12/12 0s 7ms/step -
 accuracy: 0.7034 - loss: 0.5583 - val_accuracy: 0.7094 - val_loss: 0.5568
 Epoch 352/1000
 12/12 0s 6ms/step -
 accuracy: 0.7087 - loss: 0.5628 - val_accuracy: 0.7094 - val_loss: 0.5567
 Epoch 353/1000
 12/12 0s 6ms/step -
 accuracy: 0.7256 - loss: 0.5488 - val_accuracy: 0.7094 - val_loss: 0.5566
 Epoch 354/1000
 12/12 0s 6ms/step -
 accuracy: 0.7326 - loss: 0.5392 - val_accuracy: 0.7094 - val_loss: 0.5565
 Epoch 355/1000
 12/12 0s 7ms/step -
 accuracy: 0.7156 - loss: 0.5475 - val_accuracy: 0.7094 - val_loss: 0.5564
 Epoch 356/1000
 12/12 0s 7ms/step -
 accuracy: 0.7101 - loss: 0.5480 - val_accuracy: 0.7094 - val_loss: 0.5563
 Epoch 357/1000
 12/12 0s 6ms/step -
 accuracy: 0.7434 - loss: 0.5350 - val_accuracy: 0.7179 - val_loss: 0.5562
 Epoch 358/1000
 12/12 0s 7ms/step -
 accuracy: 0.7223 - loss: 0.5355 - val_accuracy: 0.7179 - val_loss: 0.5561
 Epoch 359/1000
 12/12 0s 6ms/step -
 accuracy: 0.7058 - loss: 0.5536 - val_accuracy: 0.7179 - val_loss: 0.5560
 Epoch 360/1000
 12/12 0s 6ms/step -
 accuracy: 0.6905 - loss: 0.5584 - val_accuracy: 0.7179 - val_loss: 0.5560
 Epoch 361/1000
 12/12 0s 6ms/step -
 accuracy: 0.6888 - loss: 0.5787 - val_accuracy: 0.7179 - val_loss: 0.5559
 Epoch 362/1000
 12/12 0s 6ms/step -
 accuracy: 0.7082 - loss: 0.5500 - val_accuracy: 0.7179 - val_loss: 0.5558
 Epoch 363/1000
 12/12 0s 6ms/step -

accuracy: 0.7303 - loss: 0.5288 - val_accuracy: 0.7179 - val_loss: 0.5558
 Epoch 364/1000
 12/12 0s 6ms/step -
 accuracy: 0.7257 - loss: 0.5351 - val_accuracy: 0.7179 - val_loss: 0.5557
 Epoch 365/1000
 12/12 0s 6ms/step -
 accuracy: 0.7371 - loss: 0.5374 - val_accuracy: 0.7179 - val_loss: 0.5556
 Epoch 366/1000
 12/12 0s 7ms/step -
 accuracy: 0.7057 - loss: 0.5624 - val_accuracy: 0.7179 - val_loss: 0.5555
 Epoch 367/1000
 12/12 0s 7ms/step -
 accuracy: 0.7152 - loss: 0.5441 - val_accuracy: 0.7179 - val_loss: 0.5555
 Epoch 368/1000
 12/12 0s 8ms/step -
 accuracy: 0.7170 - loss: 0.5425 - val_accuracy: 0.7179 - val_loss: 0.5554
 Epoch 369/1000
 12/12 0s 6ms/step -
 accuracy: 0.7041 - loss: 0.5558 - val_accuracy: 0.7179 - val_loss: 0.5553
 Epoch 370/1000
 12/12 0s 7ms/step -
 accuracy: 0.7260 - loss: 0.5322 - val_accuracy: 0.7179 - val_loss: 0.5552
 Epoch 371/1000
 12/12 0s 8ms/step -
 accuracy: 0.7103 - loss: 0.5544 - val_accuracy: 0.7179 - val_loss: 0.5552
 Epoch 372/1000
 12/12 0s 7ms/step -
 accuracy: 0.7239 - loss: 0.5485 - val_accuracy: 0.7179 - val_loss: 0.5551
 Epoch 373/1000
 12/12 0s 6ms/step -
 accuracy: 0.6888 - loss: 0.5686 - val_accuracy: 0.7179 - val_loss: 0.5550
 Epoch 374/1000
 12/12 0s 6ms/step -
 accuracy: 0.7351 - loss: 0.5368 - val_accuracy: 0.7179 - val_loss: 0.5549
 Epoch 375/1000
 12/12 0s 6ms/step -
 accuracy: 0.7116 - loss: 0.5451 - val_accuracy: 0.7179 - val_loss: 0.5549
 Epoch 376/1000
 12/12 0s 8ms/step -
 accuracy: 0.7068 - loss: 0.5516 - val_accuracy: 0.7179 - val_loss: 0.5548
 Epoch 377/1000
 12/12 0s 12ms/step -
 accuracy: 0.7181 - loss: 0.5428 - val_accuracy: 0.7179 - val_loss: 0.5547
 Epoch 378/1000
 12/12 0s 8ms/step -
 accuracy: 0.7276 - loss: 0.5272 - val_accuracy: 0.7179 - val_loss: 0.5546
 Epoch 379/1000
 12/12 0s 10ms/step -

accuracy: 0.7134 - loss: 0.5552 - val_accuracy: 0.7179 - val_loss: 0.5546
 Epoch 380/1000
 12/12 0s 9ms/step -
 accuracy: 0.7134 - loss: 0.5458 - val_accuracy: 0.7179 - val_loss: 0.5545
 Epoch 381/1000
 12/12 0s 10ms/step -
 accuracy: 0.7154 - loss: 0.5428 - val_accuracy: 0.7179 - val_loss: 0.5544
 Epoch 382/1000
 12/12 0s 8ms/step -
 accuracy: 0.7201 - loss: 0.5452 - val_accuracy: 0.7179 - val_loss: 0.5543
 Epoch 383/1000
 12/12 0s 8ms/step -
 accuracy: 0.6988 - loss: 0.5697 - val_accuracy: 0.7179 - val_loss: 0.5543
 Epoch 384/1000
 12/12 0s 8ms/step -
 accuracy: 0.6814 - loss: 0.5740 - val_accuracy: 0.7179 - val_loss: 0.5542
 Epoch 385/1000
 12/12 0s 10ms/step -
 accuracy: 0.7179 - loss: 0.5464 - val_accuracy: 0.7179 - val_loss: 0.5542
 Epoch 386/1000
 12/12 0s 9ms/step -
 accuracy: 0.7117 - loss: 0.5521 - val_accuracy: 0.7179 - val_loss: 0.5541
 Epoch 387/1000
 12/12 0s 10ms/step -
 accuracy: 0.6877 - loss: 0.5649 - val_accuracy: 0.7179 - val_loss: 0.5541
 Epoch 388/1000
 12/12 0s 8ms/step -
 accuracy: 0.7334 - loss: 0.5313 - val_accuracy: 0.7179 - val_loss: 0.5540
 Epoch 389/1000
 12/12 0s 8ms/step -
 accuracy: 0.6980 - loss: 0.5585 - val_accuracy: 0.7179 - val_loss: 0.5539
 Epoch 390/1000
 12/12 0s 7ms/step -
 accuracy: 0.7219 - loss: 0.5448 - val_accuracy: 0.7179 - val_loss: 0.5539
 Epoch 391/1000
 12/12 0s 9ms/step -
 accuracy: 0.7394 - loss: 0.5252 - val_accuracy: 0.7179 - val_loss: 0.5537
 Epoch 392/1000
 12/12 0s 13ms/step -
 accuracy: 0.7101 - loss: 0.5402 - val_accuracy: 0.7179 - val_loss: 0.5537
 Epoch 393/1000
 12/12 0s 10ms/step -
 accuracy: 0.6895 - loss: 0.5634 - val_accuracy: 0.7179 - val_loss: 0.5536
 Epoch 394/1000
 12/12 0s 11ms/step -
 accuracy: 0.7122 - loss: 0.5557 - val_accuracy: 0.7179 - val_loss: 0.5536
 Epoch 395/1000
 12/12 0s 8ms/step -

accuracy: 0.7097 - loss: 0.5536 - val_accuracy: 0.7179 - val_loss: 0.5536
 Epoch 396/1000
 12/12 0s 7ms/step -
 accuracy: 0.6917 - loss: 0.5581 - val_accuracy: 0.7179 - val_loss: 0.5535
 Epoch 397/1000
 12/12 0s 8ms/step -
 accuracy: 0.7225 - loss: 0.5384 - val_accuracy: 0.7179 - val_loss: 0.5534
 Epoch 398/1000
 12/12 0s 8ms/step -
 accuracy: 0.7116 - loss: 0.5434 - val_accuracy: 0.7179 - val_loss: 0.5534
 Epoch 399/1000
 12/12 0s 8ms/step -
 accuracy: 0.7315 - loss: 0.5285 - val_accuracy: 0.7179 - val_loss: 0.5533
 Epoch 400/1000
 12/12 0s 10ms/step -
 accuracy: 0.7294 - loss: 0.5374 - val_accuracy: 0.7179 - val_loss: 0.5531
 Epoch 401/1000
 12/12 0s 8ms/step -
 accuracy: 0.7074 - loss: 0.5537 - val_accuracy: 0.7179 - val_loss: 0.5531
 Epoch 402/1000
 12/12 0s 8ms/step -
 accuracy: 0.7168 - loss: 0.5436 - val_accuracy: 0.7179 - val_loss: 0.5530
 Epoch 403/1000
 12/12 0s 8ms/step -
 accuracy: 0.7245 - loss: 0.5462 - val_accuracy: 0.7179 - val_loss: 0.5529
 Epoch 404/1000
 12/12 0s 12ms/step -
 accuracy: 0.7299 - loss: 0.5192 - val_accuracy: 0.7179 - val_loss: 0.5529
 Epoch 405/1000
 12/12 0s 9ms/step -
 accuracy: 0.7199 - loss: 0.5353 - val_accuracy: 0.7179 - val_loss: 0.5528
 Epoch 406/1000
 12/12 0s 10ms/step -
 accuracy: 0.7121 - loss: 0.5454 - val_accuracy: 0.7179 - val_loss: 0.5527
 Epoch 407/1000
 12/12 0s 10ms/step -
 accuracy: 0.7035 - loss: 0.5553 - val_accuracy: 0.7179 - val_loss: 0.5527
 Epoch 408/1000
 12/12 0s 10ms/step -
 accuracy: 0.7313 - loss: 0.5351 - val_accuracy: 0.7179 - val_loss: 0.5526
 Epoch 409/1000
 12/12 0s 10ms/step -
 accuracy: 0.7344 - loss: 0.5222 - val_accuracy: 0.7179 - val_loss: 0.5524
 Epoch 410/1000
 12/12 0s 9ms/step -
 accuracy: 0.7003 - loss: 0.5447 - val_accuracy: 0.7179 - val_loss: 0.5524
 Epoch 411/1000
 12/12 0s 8ms/step -

accuracy: 0.7176 - loss: 0.5404 - val_accuracy: 0.7179 - val_loss: 0.5523
 Epoch 412/1000
 12/12 0s 11ms/step -
 accuracy: 0.7396 - loss: 0.5191 - val_accuracy: 0.7179 - val_loss: 0.5522
 Epoch 413/1000
 12/12 0s 8ms/step -
 accuracy: 0.7152 - loss: 0.5419 - val_accuracy: 0.7179 - val_loss: 0.5521
 Epoch 414/1000
 12/12 0s 8ms/step -
 accuracy: 0.7168 - loss: 0.5389 - val_accuracy: 0.7179 - val_loss: 0.5521
 Epoch 415/1000
 12/12 0s 14ms/step -
 accuracy: 0.7085 - loss: 0.5482 - val_accuracy: 0.7179 - val_loss: 0.5521
 Epoch 416/1000
 12/12 0s 8ms/step -
 accuracy: 0.7413 - loss: 0.5066 - val_accuracy: 0.7179 - val_loss: 0.5520
 Epoch 417/1000
 12/12 0s 8ms/step -
 accuracy: 0.6951 - loss: 0.5505 - val_accuracy: 0.7179 - val_loss: 0.5519
 Epoch 418/1000
 12/12 0s 8ms/step -
 accuracy: 0.7103 - loss: 0.5548 - val_accuracy: 0.7179 - val_loss: 0.5519
 Epoch 419/1000
 12/12 0s 8ms/step -
 accuracy: 0.6715 - loss: 0.5782 - val_accuracy: 0.7179 - val_loss: 0.5518
 Epoch 420/1000
 12/12 0s 8ms/step -
 accuracy: 0.7348 - loss: 0.5329 - val_accuracy: 0.7179 - val_loss: 0.5518
 Epoch 421/1000
 12/12 0s 8ms/step -
 accuracy: 0.6729 - loss: 0.5660 - val_accuracy: 0.7179 - val_loss: 0.5517
 Epoch 422/1000
 12/12 0s 10ms/step -
 accuracy: 0.7004 - loss: 0.5581 - val_accuracy: 0.7179 - val_loss: 0.5516
 Epoch 423/1000
 12/12 0s 7ms/step -
 accuracy: 0.7259 - loss: 0.5349 - val_accuracy: 0.7179 - val_loss: 0.5516
 Epoch 424/1000
 12/12 0s 7ms/step -
 accuracy: 0.6803 - loss: 0.5807 - val_accuracy: 0.7179 - val_loss: 0.5515
 Epoch 425/1000
 12/12 0s 11ms/step -
 accuracy: 0.7106 - loss: 0.5416 - val_accuracy: 0.7179 - val_loss: 0.5515
 Epoch 426/1000
 12/12 0s 7ms/step -
 accuracy: 0.7201 - loss: 0.5468 - val_accuracy: 0.7179 - val_loss: 0.5514
 Epoch 427/1000
 12/12 0s 7ms/step -

accuracy: 0.7079 - loss: 0.5440 - val_accuracy: 0.7179 - val_loss: 0.5514
 Epoch 428/1000
 12/12 0s 6ms/step -
 accuracy: 0.6949 - loss: 0.5634 - val_accuracy: 0.7179 - val_loss: 0.5513
 Epoch 429/1000
 12/12 0s 6ms/step -
 accuracy: 0.7230 - loss: 0.5361 - val_accuracy: 0.7179 - val_loss: 0.5512
 Epoch 430/1000
 12/12 0s 7ms/step -
 accuracy: 0.7302 - loss: 0.5224 - val_accuracy: 0.7179 - val_loss: 0.5512
 Epoch 431/1000
 12/12 0s 7ms/step -
 accuracy: 0.6858 - loss: 0.5588 - val_accuracy: 0.7179 - val_loss: 0.5511
 Epoch 432/1000
 12/12 0s 7ms/step -
 accuracy: 0.7365 - loss: 0.5263 - val_accuracy: 0.7179 - val_loss: 0.5510
 Epoch 433/1000
 12/12 0s 7ms/step -
 accuracy: 0.7134 - loss: 0.5464 - val_accuracy: 0.7179 - val_loss: 0.5510
 Epoch 434/1000
 12/12 0s 6ms/step -
 accuracy: 0.7022 - loss: 0.5518 - val_accuracy: 0.7179 - val_loss: 0.5509
 Epoch 435/1000
 12/12 0s 6ms/step -
 accuracy: 0.7054 - loss: 0.5476 - val_accuracy: 0.7179 - val_loss: 0.5508
 Epoch 436/1000
 12/12 0s 6ms/step -
 accuracy: 0.6897 - loss: 0.5640 - val_accuracy: 0.7179 - val_loss: 0.5508
 Epoch 437/1000
 12/12 0s 6ms/step -
 accuracy: 0.7114 - loss: 0.5478 - val_accuracy: 0.7179 - val_loss: 0.5508
 Epoch 438/1000
 12/12 0s 7ms/step -
 accuracy: 0.6964 - loss: 0.5562 - val_accuracy: 0.7179 - val_loss: 0.5507
 Epoch 439/1000
 12/12 0s 6ms/step -
 accuracy: 0.6878 - loss: 0.5660 - val_accuracy: 0.7179 - val_loss: 0.5507
 Epoch 440/1000
 12/12 0s 6ms/step -
 accuracy: 0.7193 - loss: 0.5362 - val_accuracy: 0.7179 - val_loss: 0.5506
 Epoch 441/1000
 12/12 0s 7ms/step -
 accuracy: 0.7174 - loss: 0.5329 - val_accuracy: 0.7179 - val_loss: 0.5506
 Epoch 442/1000
 12/12 0s 7ms/step -
 accuracy: 0.7254 - loss: 0.5362 - val_accuracy: 0.7179 - val_loss: 0.5504
 Epoch 443/1000
 12/12 0s 6ms/step -

accuracy: 0.7261 - loss: 0.5304 - val_accuracy: 0.7179 - val_loss: 0.5504
 Epoch 444/1000
 12/12 0s 6ms/step -
 accuracy: 0.6889 - loss: 0.5611 - val_accuracy: 0.7179 - val_loss: 0.5504
 Epoch 445/1000
 12/12 0s 6ms/step -
 accuracy: 0.7182 - loss: 0.5410 - val_accuracy: 0.7179 - val_loss: 0.5503
 Epoch 446/1000
 12/12 0s 7ms/step -
 accuracy: 0.7151 - loss: 0.5382 - val_accuracy: 0.7179 - val_loss: 0.5502
 Epoch 447/1000
 12/12 0s 8ms/step -
 accuracy: 0.7327 - loss: 0.5304 - val_accuracy: 0.7179 - val_loss: 0.5501
 Epoch 448/1000
 12/12 0s 8ms/step -
 accuracy: 0.6594 - loss: 0.5757 - val_accuracy: 0.7179 - val_loss: 0.5501
 Epoch 449/1000
 12/12 0s 15ms/step -
 accuracy: 0.7070 - loss: 0.5482 - val_accuracy: 0.7179 - val_loss: 0.5501
 Epoch 450/1000
 12/12 0s 8ms/step -
 accuracy: 0.7007 - loss: 0.5423 - val_accuracy: 0.7179 - val_loss: 0.5500
 Epoch 451/1000
 12/12 0s 8ms/step -
 accuracy: 0.6934 - loss: 0.5663 - val_accuracy: 0.7179 - val_loss: 0.5499
 Epoch 452/1000
 12/12 0s 9ms/step -
 accuracy: 0.7221 - loss: 0.5475 - val_accuracy: 0.7179 - val_loss: 0.5498
 Epoch 453/1000
 12/12 0s 9ms/step -
 accuracy: 0.7329 - loss: 0.5334 - val_accuracy: 0.7179 - val_loss: 0.5497
 Epoch 454/1000
 12/12 0s 9ms/step -
 accuracy: 0.6912 - loss: 0.5540 - val_accuracy: 0.7179 - val_loss: 0.5497
 Epoch 455/1000
 12/12 0s 10ms/step -
 accuracy: 0.7090 - loss: 0.5538 - val_accuracy: 0.7179 - val_loss: 0.5497
 Epoch 456/1000
 12/12 0s 17ms/step -
 accuracy: 0.7267 - loss: 0.5191 - val_accuracy: 0.7179 - val_loss: 0.5495
 Epoch 457/1000
 12/12 0s 10ms/step -
 accuracy: 0.7100 - loss: 0.5475 - val_accuracy: 0.7179 - val_loss: 0.5494
 Epoch 458/1000
 12/12 0s 8ms/step -
 accuracy: 0.7149 - loss: 0.5407 - val_accuracy: 0.7094 - val_loss: 0.5493
 Epoch 459/1000
 12/12 0s 9ms/step -

accuracy: 0.7128 - loss: 0.5387 - val_accuracy: 0.7179 - val_loss: 0.5493
 Epoch 460/1000
 12/12 0s 9ms/step -
 accuracy: 0.7459 - loss: 0.5078 - val_accuracy: 0.7094 - val_loss: 0.5492
 Epoch 461/1000
 12/12 0s 8ms/step -
 accuracy: 0.7063 - loss: 0.5380 - val_accuracy: 0.7094 - val_loss: 0.5492
 Epoch 462/1000
 12/12 0s 7ms/step -
 accuracy: 0.7020 - loss: 0.5469 - val_accuracy: 0.7179 - val_loss: 0.5492
 Epoch 463/1000
 12/12 0s 8ms/step -
 accuracy: 0.7041 - loss: 0.5525 - val_accuracy: 0.7179 - val_loss: 0.5491
 Epoch 464/1000
 12/12 0s 8ms/step -
 accuracy: 0.7196 - loss: 0.5228 - val_accuracy: 0.7179 - val_loss: 0.5491
 Epoch 465/1000
 12/12 0s 8ms/step -
 accuracy: 0.7192 - loss: 0.5327 - val_accuracy: 0.7179 - val_loss: 0.5490
 Epoch 466/1000
 12/12 0s 8ms/step -
 accuracy: 0.7126 - loss: 0.5392 - val_accuracy: 0.7179 - val_loss: 0.5490
 Epoch 467/1000
 12/12 0s 8ms/step -
 accuracy: 0.7285 - loss: 0.5255 - val_accuracy: 0.7179 - val_loss: 0.5490
 Epoch 468/1000
 12/12 0s 15ms/step -
 accuracy: 0.7364 - loss: 0.5220 - val_accuracy: 0.7179 - val_loss: 0.5489
 Epoch 469/1000
 12/12 0s 10ms/step -
 accuracy: 0.6980 - loss: 0.5601 - val_accuracy: 0.7179 - val_loss: 0.5488
 Epoch 470/1000
 12/12 0s 10ms/step -
 accuracy: 0.6851 - loss: 0.5710 - val_accuracy: 0.7179 - val_loss: 0.5488
 Epoch 471/1000
 12/12 0s 17ms/step -
 accuracy: 0.6873 - loss: 0.5553 - val_accuracy: 0.7179 - val_loss: 0.5488
 Epoch 472/1000
 12/12 0s 10ms/step -
 accuracy: 0.7276 - loss: 0.5283 - val_accuracy: 0.7179 - val_loss: 0.5487
 Epoch 473/1000
 12/12 0s 9ms/step -
 accuracy: 0.7059 - loss: 0.5539 - val_accuracy: 0.7179 - val_loss: 0.5487
 Epoch 474/1000
 12/12 0s 8ms/step -
 accuracy: 0.7044 - loss: 0.5459 - val_accuracy: 0.7094 - val_loss: 0.5485
 Epoch 475/1000
 12/12 0s 15ms/step -

accuracy: 0.7115 - loss: 0.5269 - val_accuracy: 0.7094 - val_loss: 0.5484
 Epoch 476/1000
 12/12 0s 10ms/step -
 accuracy: 0.7148 - loss: 0.5381 - val_accuracy: 0.7094 - val_loss: 0.5483
 Epoch 477/1000
 12/12 0s 19ms/step -
 accuracy: 0.7322 - loss: 0.5254 - val_accuracy: 0.7094 - val_loss: 0.5483
 Epoch 478/1000
 12/12 0s 16ms/step -
 accuracy: 0.7106 - loss: 0.5501 - val_accuracy: 0.7094 - val_loss: 0.5482
 Epoch 479/1000
 12/12 0s 10ms/step -
 accuracy: 0.7112 - loss: 0.5414 - val_accuracy: 0.7094 - val_loss: 0.5481
 Epoch 480/1000
 12/12 0s 10ms/step -
 accuracy: 0.7207 - loss: 0.5349 - val_accuracy: 0.7094 - val_loss: 0.5481
 Epoch 481/1000
 12/12 0s 10ms/step -
 accuracy: 0.6889 - loss: 0.5594 - val_accuracy: 0.7094 - val_loss: 0.5480
 Epoch 482/1000
 12/12 0s 14ms/step -
 accuracy: 0.7205 - loss: 0.5368 - val_accuracy: 0.7094 - val_loss: 0.5480
 Epoch 483/1000
 12/12 0s 10ms/step -
 accuracy: 0.6860 - loss: 0.5675 - val_accuracy: 0.7094 - val_loss: 0.5480
 Epoch 484/1000
 12/12 0s 9ms/step -
 accuracy: 0.6994 - loss: 0.5540 - val_accuracy: 0.7094 - val_loss: 0.5480
 Epoch 485/1000
 12/12 0s 9ms/step -
 accuracy: 0.7094 - loss: 0.5490 - val_accuracy: 0.7094 - val_loss: 0.5479
 Epoch 486/1000
 12/12 0s 13ms/step -
 accuracy: 0.7094 - loss: 0.5312 - val_accuracy: 0.7094 - val_loss: 0.5478
 Epoch 487/1000
 12/12 0s 9ms/step -
 accuracy: 0.7448 - loss: 0.5255 - val_accuracy: 0.7094 - val_loss: 0.5477
 Epoch 488/1000
 12/12 0s 9ms/step -
 accuracy: 0.7371 - loss: 0.5261 - val_accuracy: 0.7094 - val_loss: 0.5476
 Epoch 489/1000
 12/12 0s 9ms/step -
 accuracy: 0.7131 - loss: 0.5371 - val_accuracy: 0.7094 - val_loss: 0.5476
 Epoch 490/1000
 12/12 0s 16ms/step -
 accuracy: 0.7367 - loss: 0.5184 - val_accuracy: 0.7094 - val_loss: 0.5474
 Epoch 491/1000
 12/12 0s 9ms/step -

accuracy: 0.7357 - loss: 0.5327 - val_accuracy: 0.7094 - val_loss: 0.5473
 Epoch 492/1000
 12/12 0s 9ms/step -
 accuracy: 0.7096 - loss: 0.5322 - val_accuracy: 0.7094 - val_loss: 0.5473
 Epoch 493/1000
 12/12 0s 9ms/step -
 accuracy: 0.7085 - loss: 0.5538 - val_accuracy: 0.7094 - val_loss: 0.5473
 Epoch 494/1000
 12/12 0s 9ms/step -
 accuracy: 0.7142 - loss: 0.5367 - val_accuracy: 0.7094 - val_loss: 0.5472
 Epoch 495/1000
 12/12 0s 8ms/step -
 accuracy: 0.7141 - loss: 0.5401 - val_accuracy: 0.7094 - val_loss: 0.5471
 Epoch 496/1000
 12/12 0s 9ms/step -
 accuracy: 0.6922 - loss: 0.5531 - val_accuracy: 0.7094 - val_loss: 0.5471
 Epoch 497/1000
 12/12 0s 13ms/step -
 accuracy: 0.7031 - loss: 0.5467 - val_accuracy: 0.7094 - val_loss: 0.5471
 Epoch 498/1000
 12/12 0s 9ms/step -
 accuracy: 0.7028 - loss: 0.5465 - val_accuracy: 0.7094 - val_loss: 0.5471
 Epoch 499/1000
 12/12 0s 9ms/step -
 accuracy: 0.7253 - loss: 0.5340 - val_accuracy: 0.7094 - val_loss: 0.5471
 Epoch 500/1000
 12/12 0s 9ms/step -
 accuracy: 0.7338 - loss: 0.5202 - val_accuracy: 0.7094 - val_loss: 0.5470
 Epoch 501/1000
 12/12 0s 8ms/step -
 accuracy: 0.7213 - loss: 0.5177 - val_accuracy: 0.7094 - val_loss: 0.5470
 Epoch 502/1000
 12/12 0s 21ms/step -
 accuracy: 0.7291 - loss: 0.5313 - val_accuracy: 0.7094 - val_loss: 0.5468
 Epoch 503/1000
 12/12 0s 10ms/step -
 accuracy: 0.7212 - loss: 0.5376 - val_accuracy: 0.7094 - val_loss: 0.5468
 Epoch 504/1000
 12/12 0s 10ms/step -
 accuracy: 0.7237 - loss: 0.5338 - val_accuracy: 0.7094 - val_loss: 0.5467
 Epoch 505/1000
 12/12 0s 9ms/step -
 accuracy: 0.6632 - loss: 0.5687 - val_accuracy: 0.7094 - val_loss: 0.5466
 Epoch 506/1000
 12/12 0s 16ms/step -
 accuracy: 0.6900 - loss: 0.5438 - val_accuracy: 0.7094 - val_loss: 0.5466
 Epoch 507/1000
 12/12 0s 12ms/step -

accuracy: 0.7049 - loss: 0.5446 - val_accuracy: 0.7094 - val_loss: 0.5466
 Epoch 508/1000
 12/12 0s 17ms/step -
 accuracy: 0.7312 - loss: 0.5265 - val_accuracy: 0.7094 - val_loss: 0.5466
 Epoch 509/1000
 12/12 0s 9ms/step -
 accuracy: 0.7146 - loss: 0.5356 - val_accuracy: 0.7094 - val_loss: 0.5466
 Epoch 510/1000
 12/12 0s 13ms/step -
 accuracy: 0.7050 - loss: 0.5525 - val_accuracy: 0.7094 - val_loss: 0.5465
 Epoch 511/1000
 12/12 0s 9ms/step -
 accuracy: 0.7043 - loss: 0.5471 - val_accuracy: 0.7094 - val_loss: 0.5464
 Epoch 512/1000
 12/12 0s 7ms/step -
 accuracy: 0.6917 - loss: 0.5500 - val_accuracy: 0.7094 - val_loss: 0.5463
 Epoch 513/1000
 12/12 0s 7ms/step -
 accuracy: 0.7406 - loss: 0.5170 - val_accuracy: 0.7094 - val_loss: 0.5463
 Epoch 514/1000
 12/12 0s 7ms/step -
 accuracy: 0.7330 - loss: 0.5214 - val_accuracy: 0.7094 - val_loss: 0.5463
 Epoch 515/1000
 12/12 0s 7ms/step -
 accuracy: 0.7120 - loss: 0.5374 - val_accuracy: 0.7094 - val_loss: 0.5462
 Epoch 516/1000
 12/12 0s 9ms/step -
 accuracy: 0.7079 - loss: 0.5325 - val_accuracy: 0.7094 - val_loss: 0.5461
 Epoch 517/1000
 12/12 0s 8ms/step -
 accuracy: 0.7276 - loss: 0.5278 - val_accuracy: 0.7094 - val_loss: 0.5460
 Epoch 518/1000
 12/12 0s 7ms/step -
 accuracy: 0.6903 - loss: 0.5478 - val_accuracy: 0.7094 - val_loss: 0.5460
 Epoch 519/1000
 12/12 0s 7ms/step -
 accuracy: 0.7066 - loss: 0.5423 - val_accuracy: 0.7094 - val_loss: 0.5459
 Epoch 520/1000
 12/12 0s 7ms/step -
 accuracy: 0.7249 - loss: 0.5150 - val_accuracy: 0.7094 - val_loss: 0.5458
 Epoch 521/1000
 12/12 0s 8ms/step -
 accuracy: 0.6923 - loss: 0.5415 - val_accuracy: 0.7094 - val_loss: 0.5458
 Epoch 522/1000
 12/12 0s 8ms/step -
 accuracy: 0.7376 - loss: 0.5102 - val_accuracy: 0.7094 - val_loss: 0.5458
 Epoch 523/1000
 12/12 0s 8ms/step -

accuracy: 0.6828 - loss: 0.5584 - val_accuracy: 0.7094 - val_loss: 0.5458
 Epoch 524/1000
 12/12 0s 17ms/step -
 accuracy: 0.7220 - loss: 0.5323 - val_accuracy: 0.7094 - val_loss: 0.5457
 Epoch 525/1000
 12/12 0s 9ms/step -
 accuracy: 0.7062 - loss: 0.5382 - val_accuracy: 0.7094 - val_loss: 0.5457
 Epoch 526/1000
 12/12 0s 8ms/step -
 accuracy: 0.6818 - loss: 0.5621 - val_accuracy: 0.7094 - val_loss: 0.5457
 Epoch 527/1000
 12/12 0s 8ms/step -
 accuracy: 0.6966 - loss: 0.5444 - val_accuracy: 0.7094 - val_loss: 0.5455
 Epoch 528/1000
 12/12 0s 7ms/step -
 accuracy: 0.6857 - loss: 0.5547 - val_accuracy: 0.7094 - val_loss: 0.5455
 Epoch 529/1000
 12/12 0s 8ms/step -
 accuracy: 0.7168 - loss: 0.5392 - val_accuracy: 0.7094 - val_loss: 0.5455
 Epoch 530/1000
 12/12 0s 7ms/step -
 accuracy: 0.6995 - loss: 0.5456 - val_accuracy: 0.7094 - val_loss: 0.5454
 Epoch 531/1000
 12/12 0s 7ms/step -
 accuracy: 0.7147 - loss: 0.5442 - val_accuracy: 0.7094 - val_loss: 0.5454
 Epoch 532/1000
 12/12 0s 6ms/step -
 accuracy: 0.6960 - loss: 0.5400 - val_accuracy: 0.7094 - val_loss: 0.5453
 Epoch 533/1000
 12/12 0s 6ms/step -
 accuracy: 0.6818 - loss: 0.5676 - val_accuracy: 0.7094 - val_loss: 0.5452
 Epoch 534/1000
 12/12 0s 7ms/step -
 accuracy: 0.7018 - loss: 0.5404 - val_accuracy: 0.7094 - val_loss: 0.5452
 Epoch 535/1000
 12/12 0s 6ms/step -
 accuracy: 0.7271 - loss: 0.5288 - val_accuracy: 0.7094 - val_loss: 0.5451
 Epoch 536/1000
 12/12 0s 8ms/step -
 accuracy: 0.7070 - loss: 0.5324 - val_accuracy: 0.7094 - val_loss: 0.5451
 Epoch 537/1000
 12/12 0s 8ms/step -
 accuracy: 0.7017 - loss: 0.5477 - val_accuracy: 0.7094 - val_loss: 0.5451
 Epoch 538/1000
 12/12 0s 8ms/step -
 accuracy: 0.7253 - loss: 0.5185 - val_accuracy: 0.7094 - val_loss: 0.5450
 Epoch 539/1000
 12/12 0s 7ms/step -

accuracy: 0.7261 - loss: 0.5234 - val_accuracy: 0.7094 - val_loss: 0.5449
 Epoch 540/1000
 12/12 0s 7ms/step -
 accuracy: 0.7044 - loss: 0.5496 - val_accuracy: 0.7094 - val_loss: 0.5448
 Epoch 541/1000
 12/12 0s 6ms/step -
 accuracy: 0.7156 - loss: 0.5315 - val_accuracy: 0.7094 - val_loss: 0.5447
 Epoch 542/1000
 12/12 0s 9ms/step -
 accuracy: 0.6879 - loss: 0.5620 - val_accuracy: 0.7094 - val_loss: 0.5447
 Epoch 543/1000
 12/12 0s 7ms/step -
 accuracy: 0.7114 - loss: 0.5414 - val_accuracy: 0.7094 - val_loss: 0.5447
 Epoch 544/1000
 12/12 0s 6ms/step -
 accuracy: 0.7268 - loss: 0.5261 - val_accuracy: 0.7094 - val_loss: 0.5446
 Epoch 545/1000
 12/12 0s 7ms/step -
 accuracy: 0.7056 - loss: 0.5397 - val_accuracy: 0.7094 - val_loss: 0.5446
 Epoch 546/1000
 12/12 0s 7ms/step -
 accuracy: 0.7157 - loss: 0.5418 - val_accuracy: 0.7094 - val_loss: 0.5444
 Epoch 547/1000
 12/12 0s 12ms/step -
 accuracy: 0.7229 - loss: 0.5322 - val_accuracy: 0.7094 - val_loss: 0.5444
 Epoch 548/1000
 12/12 0s 8ms/step -
 accuracy: 0.6919 - loss: 0.5511 - val_accuracy: 0.7094 - val_loss: 0.5444
 Epoch 549/1000
 12/12 0s 7ms/step -
 accuracy: 0.6924 - loss: 0.5511 - val_accuracy: 0.7094 - val_loss: 0.5444
 Epoch 550/1000
 12/12 0s 7ms/step -
 accuracy: 0.7090 - loss: 0.5348 - val_accuracy: 0.7094 - val_loss: 0.5443
 Epoch 551/1000
 12/12 0s 6ms/step -
 accuracy: 0.6953 - loss: 0.5389 - val_accuracy: 0.7094 - val_loss: 0.5443
 Epoch 552/1000
 12/12 0s 7ms/step -
 accuracy: 0.7240 - loss: 0.5343 - val_accuracy: 0.7094 - val_loss: 0.5441
 Epoch 553/1000
 12/12 0s 6ms/step -
 accuracy: 0.7188 - loss: 0.5306 - val_accuracy: 0.7094 - val_loss: 0.5441
 Epoch 554/1000
 12/12 0s 6ms/step -
 accuracy: 0.7118 - loss: 0.5328 - val_accuracy: 0.7094 - val_loss: 0.5440
 Epoch 555/1000
 12/12 0s 7ms/step -

accuracy: 0.7468 - loss: 0.5075 - val_accuracy: 0.7094 - val_loss: 0.5440
 Epoch 556/1000
 12/12 0s 6ms/step -
 accuracy: 0.6726 - loss: 0.5696 - val_accuracy: 0.7094 - val_loss: 0.5440
 Epoch 557/1000
 12/12 0s 7ms/step -
 accuracy: 0.7224 - loss: 0.5207 - val_accuracy: 0.7094 - val_loss: 0.5439
 Epoch 558/1000
 12/12 0s 6ms/step -
 accuracy: 0.7314 - loss: 0.5182 - val_accuracy: 0.7094 - val_loss: 0.5438
 Epoch 559/1000
 12/12 0s 7ms/step -
 accuracy: 0.7260 - loss: 0.5205 - val_accuracy: 0.7094 - val_loss: 0.5438
 Epoch 560/1000
 12/12 0s 9ms/step -
 accuracy: 0.7436 - loss: 0.5042 - val_accuracy: 0.7009 - val_loss: 0.5436
 Epoch 561/1000
 12/12 0s 8ms/step -
 accuracy: 0.6812 - loss: 0.5609 - val_accuracy: 0.7009 - val_loss: 0.5436
 Epoch 562/1000
 12/12 0s 10ms/step -
 accuracy: 0.7184 - loss: 0.5367 - val_accuracy: 0.7009 - val_loss: 0.5435
 Epoch 563/1000
 12/12 0s 8ms/step -
 accuracy: 0.6803 - loss: 0.5472 - val_accuracy: 0.7009 - val_loss: 0.5435
 Epoch 564/1000
 12/12 0s 9ms/step -
 accuracy: 0.7137 - loss: 0.5282 - val_accuracy: 0.7009 - val_loss: 0.5434
 Epoch 565/1000
 12/12 0s 8ms/step -
 accuracy: 0.7164 - loss: 0.5294 - val_accuracy: 0.7009 - val_loss: 0.5434
 Epoch 566/1000
 12/12 0s 8ms/step -
 accuracy: 0.6955 - loss: 0.5384 - val_accuracy: 0.7009 - val_loss: 0.5434
 Epoch 567/1000
 12/12 0s 7ms/step -
 accuracy: 0.7321 - loss: 0.5093 - val_accuracy: 0.7094 - val_loss: 0.5434
 Epoch 568/1000
 12/12 0s 7ms/step -
 accuracy: 0.7285 - loss: 0.5227 - val_accuracy: 0.7094 - val_loss: 0.5434
 Epoch 569/1000
 12/12 0s 7ms/step -
 accuracy: 0.7135 - loss: 0.5346 - val_accuracy: 0.7009 - val_loss: 0.5432
 Epoch 570/1000
 12/12 0s 6ms/step -
 accuracy: 0.7151 - loss: 0.5314 - val_accuracy: 0.7009 - val_loss: 0.5432
 Epoch 571/1000
 12/12 0s 7ms/step -

accuracy: 0.7139 - loss: 0.5310 - val_accuracy: 0.7009 - val_loss: 0.5431
 Epoch 572/1000
 12/12 0s 6ms/step -
 accuracy: 0.7341 - loss: 0.5107 - val_accuracy: 0.7009 - val_loss: 0.5430
 Epoch 573/1000
 12/12 0s 7ms/step -
 accuracy: 0.7292 - loss: 0.5256 - val_accuracy: 0.7009 - val_loss: 0.5429
 Epoch 574/1000
 12/12 0s 7ms/step -
 accuracy: 0.7053 - loss: 0.5439 - val_accuracy: 0.7009 - val_loss: 0.5429
 Epoch 575/1000
 12/12 0s 8ms/step -
 accuracy: 0.6930 - loss: 0.5573 - val_accuracy: 0.7009 - val_loss: 0.5429
 Epoch 576/1000
 12/12 0s 9ms/step -
 accuracy: 0.7188 - loss: 0.5185 - val_accuracy: 0.7009 - val_loss: 0.5428
 Epoch 577/1000
 12/12 0s 8ms/step -
 accuracy: 0.6908 - loss: 0.5519 - val_accuracy: 0.7009 - val_loss: 0.5428
 Epoch 578/1000
 12/12 0s 7ms/step -
 accuracy: 0.6884 - loss: 0.5493 - val_accuracy: 0.7009 - val_loss: 0.5427
 Epoch 579/1000
 12/12 0s 12ms/step -
 accuracy: 0.7166 - loss: 0.5383 - val_accuracy: 0.7009 - val_loss: 0.5426
 Epoch 580/1000
 12/12 0s 8ms/step -
 accuracy: 0.6975 - loss: 0.5495 - val_accuracy: 0.7009 - val_loss: 0.5426
 Epoch 581/1000
 12/12 0s 7ms/step -
 accuracy: 0.7229 - loss: 0.5261 - val_accuracy: 0.7009 - val_loss: 0.5425
 Epoch 582/1000
 12/12 0s 8ms/step -
 accuracy: 0.6840 - loss: 0.5478 - val_accuracy: 0.7009 - val_loss: 0.5425
 Epoch 583/1000
 12/12 0s 7ms/step -
 accuracy: 0.7094 - loss: 0.5417 - val_accuracy: 0.7009 - val_loss: 0.5425
 Epoch 584/1000
 12/12 0s 8ms/step -
 accuracy: 0.7282 - loss: 0.5278 - val_accuracy: 0.7009 - val_loss: 0.5424
 Epoch 585/1000
 12/12 0s 7ms/step -
 accuracy: 0.7172 - loss: 0.5269 - val_accuracy: 0.7009 - val_loss: 0.5424
 Epoch 586/1000
 12/12 0s 7ms/step -
 accuracy: 0.6888 - loss: 0.5382 - val_accuracy: 0.7009 - val_loss: 0.5424
 Epoch 587/1000
 12/12 0s 12ms/step -

accuracy: 0.7056 - loss: 0.5278 - val_accuracy: 0.7009 - val_loss: 0.5423
 Epoch 588/1000
 12/12 0s 8ms/step -
 accuracy: 0.7277 - loss: 0.5256 - val_accuracy: 0.7009 - val_loss: 0.5422
 Epoch 589/1000
 12/12 0s 8ms/step -
 accuracy: 0.6692 - loss: 0.5595 - val_accuracy: 0.7009 - val_loss: 0.5422
 Epoch 590/1000
 12/12 0s 7ms/step -
 accuracy: 0.7109 - loss: 0.5313 - val_accuracy: 0.7009 - val_loss: 0.5421
 Epoch 591/1000
 12/12 0s 8ms/step -
 accuracy: 0.7065 - loss: 0.5282 - val_accuracy: 0.7009 - val_loss: 0.5421
 Epoch 592/1000
 12/12 0s 7ms/step -
 accuracy: 0.6876 - loss: 0.5456 - val_accuracy: 0.7009 - val_loss: 0.5421
 Epoch 593/1000
 12/12 0s 8ms/step -
 accuracy: 0.7123 - loss: 0.5175 - val_accuracy: 0.7009 - val_loss: 0.5420
 Epoch 594/1000
 12/12 0s 7ms/step -
 accuracy: 0.7166 - loss: 0.5189 - val_accuracy: 0.7009 - val_loss: 0.5420
 Epoch 595/1000
 12/12 0s 7ms/step -
 accuracy: 0.6965 - loss: 0.5410 - val_accuracy: 0.7009 - val_loss: 0.5420
 Epoch 596/1000
 12/12 0s 8ms/step -
 accuracy: 0.7030 - loss: 0.5374 - val_accuracy: 0.7009 - val_loss: 0.5420
 Epoch 597/1000
 12/12 0s 16ms/step -
 accuracy: 0.7040 - loss: 0.5278 - val_accuracy: 0.7009 - val_loss: 0.5419
 Epoch 598/1000
 12/12 0s 21ms/step -
 accuracy: 0.7329 - loss: 0.5115 - val_accuracy: 0.7009 - val_loss: 0.5418
 Epoch 599/1000
 12/12 0s 15ms/step -
 accuracy: 0.7223 - loss: 0.5237 - val_accuracy: 0.7009 - val_loss: 0.5417
 Epoch 600/1000
 12/12 0s 10ms/step -
 accuracy: 0.7276 - loss: 0.5155 - val_accuracy: 0.7009 - val_loss: 0.5416
 Epoch 601/1000
 12/12 0s 11ms/step -
 accuracy: 0.6883 - loss: 0.5460 - val_accuracy: 0.7009 - val_loss: 0.5416
 Epoch 602/1000
 12/12 0s 22ms/step -
 accuracy: 0.7086 - loss: 0.5344 - val_accuracy: 0.7009 - val_loss: 0.5416
 Epoch 603/1000
 12/12 0s 18ms/step -

accuracy: 0.7035 - loss: 0.5271 - val_accuracy: 0.7009 - val_loss: 0.5415
 Epoch 604/1000
 12/12 0s 27ms/step -
 accuracy: 0.6695 - loss: 0.5599 - val_accuracy: 0.7009 - val_loss: 0.5414
 Epoch 605/1000
 12/12 0s 17ms/step -
 accuracy: 0.6961 - loss: 0.5440 - val_accuracy: 0.7094 - val_loss: 0.5413
 Epoch 606/1000
 12/12 0s 30ms/step -
 accuracy: 0.6929 - loss: 0.5286 - val_accuracy: 0.7009 - val_loss: 0.5413
 Epoch 607/1000
 12/12 0s 23ms/step -
 accuracy: 0.7350 - loss: 0.5109 - val_accuracy: 0.7265 - val_loss: 0.5411
 Epoch 608/1000
 12/12 0s 10ms/step -
 accuracy: 0.7033 - loss: 0.5310 - val_accuracy: 0.7265 - val_loss: 0.5410
 Epoch 609/1000
 12/12 0s 10ms/step -
 accuracy: 0.7080 - loss: 0.5354 - val_accuracy: 0.7265 - val_loss: 0.5410
 Epoch 610/1000
 12/12 0s 14ms/step -
 accuracy: 0.7128 - loss: 0.5326 - val_accuracy: 0.7265 - val_loss: 0.5410
 Epoch 611/1000
 12/12 0s 8ms/step -
 accuracy: 0.7025 - loss: 0.5396 - val_accuracy: 0.7265 - val_loss: 0.5409
 Epoch 612/1000
 12/12 0s 9ms/step -
 accuracy: 0.7132 - loss: 0.5267 - val_accuracy: 0.7265 - val_loss: 0.5409
 Epoch 613/1000
 12/12 0s 10ms/step -
 accuracy: 0.7071 - loss: 0.5338 - val_accuracy: 0.7265 - val_loss: 0.5408
 Epoch 614/1000
 12/12 0s 9ms/step -
 accuracy: 0.7022 - loss: 0.5456 - val_accuracy: 0.7265 - val_loss: 0.5408
 Epoch 615/1000
 12/12 0s 9ms/step -
 accuracy: 0.6876 - loss: 0.5467 - val_accuracy: 0.7265 - val_loss: 0.5408
 Epoch 616/1000
 12/12 0s 8ms/step -
 accuracy: 0.6874 - loss: 0.5459 - val_accuracy: 0.7265 - val_loss: 0.5408
 Epoch 617/1000
 12/12 0s 7ms/step -
 accuracy: 0.6979 - loss: 0.5394 - val_accuracy: 0.7265 - val_loss: 0.5407
 Epoch 618/1000
 12/12 0s 7ms/step -
 accuracy: 0.6977 - loss: 0.5501 - val_accuracy: 0.7009 - val_loss: 0.5408
 Epoch 619/1000
 12/12 0s 7ms/step -

accuracy: 0.7030 - loss: 0.5339 - val_accuracy: 0.7009 - val_loss: 0.5407
 Epoch 620/1000
 12/12 0s 7ms/step -
 accuracy: 0.6789 - loss: 0.5584 - val_accuracy: 0.7009 - val_loss: 0.5407
 Epoch 621/1000
 12/12 0s 7ms/step -
 accuracy: 0.6750 - loss: 0.5429 - val_accuracy: 0.7009 - val_loss: 0.5407
 Epoch 622/1000
 12/12 0s 8ms/step -
 accuracy: 0.7045 - loss: 0.5313 - val_accuracy: 0.7009 - val_loss: 0.5407
 Epoch 623/1000
 12/12 0s 8ms/step -
 accuracy: 0.7100 - loss: 0.5264 - val_accuracy: 0.7009 - val_loss: 0.5407
 Epoch 624/1000
 12/12 0s 8ms/step -
 accuracy: 0.7059 - loss: 0.5347 - val_accuracy: 0.7009 - val_loss: 0.5406
 Epoch 625/1000
 12/12 0s 10ms/step -
 accuracy: 0.7222 - loss: 0.5178 - val_accuracy: 0.7094 - val_loss: 0.5405
 Epoch 626/1000
 12/12 0s 19ms/step -
 accuracy: 0.7135 - loss: 0.5252 - val_accuracy: 0.7009 - val_loss: 0.5404
 Epoch 627/1000
 12/12 0s 13ms/step -
 accuracy: 0.7085 - loss: 0.5306 - val_accuracy: 0.7094 - val_loss: 0.5404
 Epoch 628/1000
 12/12 0s 12ms/step -
 accuracy: 0.6968 - loss: 0.5402 - val_accuracy: 0.7179 - val_loss: 0.5403
 Epoch 629/1000
 12/12 0s 9ms/step -
 accuracy: 0.7182 - loss: 0.5113 - val_accuracy: 0.7265 - val_loss: 0.5402
 Epoch 630/1000
 12/12 0s 9ms/step -
 accuracy: 0.7187 - loss: 0.5242 - val_accuracy: 0.7179 - val_loss: 0.5402
 Epoch 631/1000
 12/12 0s 9ms/step -
 accuracy: 0.6623 - loss: 0.5585 - val_accuracy: 0.7009 - val_loss: 0.5403
 Epoch 632/1000
 12/12 0s 8ms/step -
 accuracy: 0.7175 - loss: 0.5134 - val_accuracy: 0.7265 - val_loss: 0.5401
 Epoch 633/1000
 12/12 0s 9ms/step -
 accuracy: 0.7048 - loss: 0.5378 - val_accuracy: 0.7265 - val_loss: 0.5400
 Epoch 634/1000
 12/12 0s 9ms/step -
 accuracy: 0.6994 - loss: 0.5463 - val_accuracy: 0.7265 - val_loss: 0.5399
 Epoch 635/1000
 12/12 0s 8ms/step -

accuracy: 0.7019 - loss: 0.5482 - val_accuracy: 0.7265 - val_loss: 0.5400
 Epoch 636/1000
 12/12 0s 9ms/step -
 accuracy: 0.7077 - loss: 0.5257 - val_accuracy: 0.7265 - val_loss: 0.5399
 Epoch 637/1000
 12/12 0s 13ms/step -
 accuracy: 0.7123 - loss: 0.5078 - val_accuracy: 0.7179 - val_loss: 0.5399
 Epoch 638/1000
 12/12 0s 9ms/step -
 accuracy: 0.7091 - loss: 0.5345 - val_accuracy: 0.7179 - val_loss: 0.5399
 Epoch 639/1000
 12/12 0s 9ms/step -
 accuracy: 0.6885 - loss: 0.5369 - val_accuracy: 0.7009 - val_loss: 0.5399
 Epoch 640/1000
 12/12 0s 8ms/step -
 accuracy: 0.7310 - loss: 0.5135 - val_accuracy: 0.7179 - val_loss: 0.5398
 Epoch 641/1000
 12/12 0s 8ms/step -
 accuracy: 0.6955 - loss: 0.5285 - val_accuracy: 0.7265 - val_loss: 0.5397
 Epoch 642/1000
 12/12 0s 9ms/step -
 accuracy: 0.6943 - loss: 0.5343 - val_accuracy: 0.7265 - val_loss: 0.5396
 Epoch 643/1000
 12/12 0s 8ms/step -
 accuracy: 0.6812 - loss: 0.5491 - val_accuracy: 0.7265 - val_loss: 0.5396
 Epoch 644/1000
 12/12 0s 8ms/step -
 accuracy: 0.7071 - loss: 0.5303 - val_accuracy: 0.7265 - val_loss: 0.5395
 Epoch 645/1000
 12/12 0s 8ms/step -
 accuracy: 0.7039 - loss: 0.5292 - val_accuracy: 0.7265 - val_loss: 0.5394
 Epoch 646/1000
 12/12 0s 8ms/step -
 accuracy: 0.7296 - loss: 0.5048 - val_accuracy: 0.7265 - val_loss: 0.5393
 Epoch 647/1000
 12/12 0s 12ms/step -
 accuracy: 0.7295 - loss: 0.5065 - val_accuracy: 0.7265 - val_loss: 0.5392
 Epoch 648/1000
 12/12 0s 8ms/step -
 accuracy: 0.6944 - loss: 0.5384 - val_accuracy: 0.7265 - val_loss: 0.5392
 Epoch 649/1000
 12/12 0s 8ms/step -
 accuracy: 0.7212 - loss: 0.5158 - val_accuracy: 0.7179 - val_loss: 0.5391
 Epoch 650/1000
 12/12 0s 7ms/step -
 accuracy: 0.6927 - loss: 0.5566 - val_accuracy: 0.7179 - val_loss: 0.5390
 Epoch 651/1000
 12/12 0s 6ms/step -

accuracy: 0.7101 - loss: 0.5159 - val_accuracy: 0.7179 - val_loss: 0.5390
 Epoch 652/1000
 12/12 0s 6ms/step -
 accuracy: 0.6945 - loss: 0.5443 - val_accuracy: 0.7265 - val_loss: 0.5390
 Epoch 653/1000
 12/12 0s 7ms/step -
 accuracy: 0.7379 - loss: 0.5009 - val_accuracy: 0.7179 - val_loss: 0.5388
 Epoch 654/1000
 12/12 0s 6ms/step -
 accuracy: 0.6758 - loss: 0.5460 - val_accuracy: 0.7179 - val_loss: 0.5388
 Epoch 655/1000
 12/12 0s 7ms/step -
 accuracy: 0.7361 - loss: 0.5002 - val_accuracy: 0.7179 - val_loss: 0.5388
 Epoch 656/1000
 12/12 0s 6ms/step -
 accuracy: 0.7010 - loss: 0.5353 - val_accuracy: 0.7179 - val_loss: 0.5387
 Epoch 657/1000
 12/12 0s 9ms/step -
 accuracy: 0.7168 - loss: 0.5211 - val_accuracy: 0.7179 - val_loss: 0.5386
 Epoch 658/1000
 12/12 0s 14ms/step -
 accuracy: 0.7078 - loss: 0.5324 - val_accuracy: 0.7179 - val_loss: 0.5386
 Epoch 659/1000
 12/12 0s 7ms/step -
 accuracy: 0.7143 - loss: 0.5365 - val_accuracy: 0.7179 - val_loss: 0.5385
 Epoch 660/1000
 12/12 0s 7ms/step -
 accuracy: 0.7032 - loss: 0.5362 - val_accuracy: 0.7179 - val_loss: 0.5385
 Epoch 661/1000
 12/12 0s 7ms/step -
 accuracy: 0.7055 - loss: 0.5208 - val_accuracy: 0.7179 - val_loss: 0.5384
 Epoch 662/1000
 12/12 0s 8ms/step -
 accuracy: 0.7057 - loss: 0.5413 - val_accuracy: 0.7179 - val_loss: 0.5384
 Epoch 663/1000
 12/12 0s 7ms/step -
 accuracy: 0.7040 - loss: 0.5395 - val_accuracy: 0.7179 - val_loss: 0.5384
 Epoch 664/1000
 12/12 0s 7ms/step -
 accuracy: 0.7048 - loss: 0.5192 - val_accuracy: 0.7179 - val_loss: 0.5384
 Epoch 665/1000
 12/12 0s 7ms/step -
 accuracy: 0.6995 - loss: 0.5465 - val_accuracy: 0.7265 - val_loss: 0.5384
 Epoch 666/1000
 12/12 0s 7ms/step -
 accuracy: 0.6971 - loss: 0.5348 - val_accuracy: 0.7265 - val_loss: 0.5384
 Epoch 667/1000
 12/12 0s 7ms/step -

accuracy: 0.6996 - loss: 0.5290 - val_accuracy: 0.7265 - val_loss: 0.5383
 Epoch 668/1000
 12/12 0s 8ms/step -
 accuracy: 0.7198 - loss: 0.5198 - val_accuracy: 0.7179 - val_loss: 0.5382
 Epoch 669/1000
 12/12 0s 18ms/step -
 accuracy: 0.6954 - loss: 0.5444 - val_accuracy: 0.7179 - val_loss: 0.5381
 Epoch 670/1000
 12/12 0s 13ms/step -
 accuracy: 0.6559 - loss: 0.5671 - val_accuracy: 0.7179 - val_loss: 0.5382
 Epoch 671/1000
 12/12 0s 9ms/step -
 accuracy: 0.6984 - loss: 0.5361 - val_accuracy: 0.7265 - val_loss: 0.5381
 Epoch 672/1000
 12/12 0s 8ms/step -
 accuracy: 0.7039 - loss: 0.5321 - val_accuracy: 0.7179 - val_loss: 0.5380
 Epoch 673/1000
 12/12 0s 8ms/step -
 accuracy: 0.6985 - loss: 0.5501 - val_accuracy: 0.7179 - val_loss: 0.5379
 Epoch 674/1000
 12/12 0s 8ms/step -
 accuracy: 0.7153 - loss: 0.5271 - val_accuracy: 0.7179 - val_loss: 0.5379
 Epoch 675/1000
 12/12 0s 8ms/step -
 accuracy: 0.7193 - loss: 0.5144 - val_accuracy: 0.7179 - val_loss: 0.5378
 Epoch 676/1000
 12/12 0s 8ms/step -
 accuracy: 0.7241 - loss: 0.5193 - val_accuracy: 0.7179 - val_loss: 0.5378
 Epoch 677/1000
 12/12 0s 15ms/step -
 accuracy: 0.7137 - loss: 0.5094 - val_accuracy: 0.7179 - val_loss: 0.5377
 Epoch 678/1000
 12/12 0s 13ms/step -
 accuracy: 0.6709 - loss: 0.5514 - val_accuracy: 0.7179 - val_loss: 0.5377
 Epoch 679/1000
 12/12 0s 10ms/step -
 accuracy: 0.6973 - loss: 0.5494 - val_accuracy: 0.7179 - val_loss: 0.5377
 Epoch 680/1000
 12/12 0s 10ms/step -
 accuracy: 0.7155 - loss: 0.5268 - val_accuracy: 0.7179 - val_loss: 0.5376
 Epoch 681/1000
 12/12 0s 16ms/step -
 accuracy: 0.7056 - loss: 0.5363 - val_accuracy: 0.7179 - val_loss: 0.5375
 Epoch 682/1000
 12/12 0s 13ms/step -
 accuracy: 0.6927 - loss: 0.5677 - val_accuracy: 0.7179 - val_loss: 0.5375
 Epoch 683/1000
 12/12 0s 12ms/step -

accuracy: 0.7036 - loss: 0.5356 - val_accuracy: 0.7179 - val_loss: 0.5375
 Epoch 684/1000
 12/12 0s 12ms/step -
 accuracy: 0.7117 - loss: 0.5304 - val_accuracy: 0.7179 - val_loss: 0.5374
 Epoch 685/1000
 12/12 0s 9ms/step -
 accuracy: 0.6912 - loss: 0.5644 - val_accuracy: 0.7179 - val_loss: 0.5374
 Epoch 686/1000
 12/12 0s 9ms/step -
 accuracy: 0.7115 - loss: 0.5110 - val_accuracy: 0.7179 - val_loss: 0.5373
 Epoch 687/1000
 12/12 0s 10ms/step -
 accuracy: 0.7051 - loss: 0.5263 - val_accuracy: 0.7179 - val_loss: 0.5373
 Epoch 688/1000
 12/12 0s 14ms/step -
 accuracy: 0.6961 - loss: 0.5326 - val_accuracy: 0.7179 - val_loss: 0.5372
 Epoch 689/1000
 12/12 0s 15ms/step -
 accuracy: 0.7112 - loss: 0.5216 - val_accuracy: 0.7179 - val_loss: 0.5371
 Epoch 690/1000
 12/12 0s 10ms/step -
 accuracy: 0.7150 - loss: 0.5294 - val_accuracy: 0.7179 - val_loss: 0.5371
 Epoch 691/1000
 12/12 0s 9ms/step -
 accuracy: 0.7244 - loss: 0.5179 - val_accuracy: 0.7179 - val_loss: 0.5370
 Epoch 692/1000
 12/12 0s 10ms/step -
 accuracy: 0.6879 - loss: 0.5323 - val_accuracy: 0.7179 - val_loss: 0.5370
 Epoch 693/1000
 12/12 0s 11ms/step -
 accuracy: 0.6835 - loss: 0.5425 - val_accuracy: 0.7179 - val_loss: 0.5370
 Epoch 694/1000
 12/12 0s 10ms/step -
 accuracy: 0.7298 - loss: 0.5186 - val_accuracy: 0.7179 - val_loss: 0.5369
 Epoch 695/1000
 12/12 0s 9ms/step -
 accuracy: 0.7145 - loss: 0.5168 - val_accuracy: 0.7179 - val_loss: 0.5369
 Epoch 696/1000
 12/12 0s 8ms/step -
 accuracy: 0.6856 - loss: 0.5480 - val_accuracy: 0.7179 - val_loss: 0.5370
 Epoch 697/1000
 12/12 0s 8ms/step -
 accuracy: 0.6882 - loss: 0.5394 - val_accuracy: 0.7179 - val_loss: 0.5369
 Epoch 698/1000
 12/12 0s 9ms/step -
 accuracy: 0.6968 - loss: 0.5436 - val_accuracy: 0.7179 - val_loss: 0.5368
 Epoch 699/1000
 12/12 0s 8ms/step -

accuracy: 0.6905 - loss: 0.5439 - val_accuracy: 0.7179 - val_loss: 0.5368
 Epoch 700/1000
 12/12 0s 9ms/step -
 accuracy: 0.7025 - loss: 0.5232 - val_accuracy: 0.7179 - val_loss: 0.5368
 Epoch 701/1000
 12/12 0s 9ms/step -
 accuracy: 0.6930 - loss: 0.5492 - val_accuracy: 0.7265 - val_loss: 0.5369
 Epoch 702/1000
 12/12 0s 9ms/step -
 accuracy: 0.6947 - loss: 0.5308 - val_accuracy: 0.7179 - val_loss: 0.5368
 Epoch 703/1000
 12/12 0s 11ms/step -
 accuracy: 0.7297 - loss: 0.5069 - val_accuracy: 0.7179 - val_loss: 0.5367
 Epoch 704/1000
 12/12 0s 12ms/step -
 accuracy: 0.6946 - loss: 0.5432 - val_accuracy: 0.7179 - val_loss: 0.5365
 Epoch 705/1000
 12/12 0s 15ms/step -
 accuracy: 0.7005 - loss: 0.5422 - val_accuracy: 0.7179 - val_loss: 0.5365
 Epoch 706/1000
 12/12 0s 15ms/step -
 accuracy: 0.7190 - loss: 0.5212 - val_accuracy: 0.7179 - val_loss: 0.5364
 Epoch 707/1000
 12/12 0s 13ms/step -
 accuracy: 0.7096 - loss: 0.5229 - val_accuracy: 0.7179 - val_loss: 0.5364
 Epoch 708/1000
 12/12 0s 10ms/step -
 accuracy: 0.6953 - loss: 0.5442 - val_accuracy: 0.7179 - val_loss: 0.5363
 Epoch 709/1000
 12/12 0s 9ms/step -
 accuracy: 0.6929 - loss: 0.5262 - val_accuracy: 0.7179 - val_loss: 0.5363
 Epoch 710/1000
 12/12 0s 9ms/step -
 accuracy: 0.6927 - loss: 0.5347 - val_accuracy: 0.7179 - val_loss: 0.5363
 Epoch 711/1000
 12/12 0s 9ms/step -
 accuracy: 0.7180 - loss: 0.5107 - val_accuracy: 0.7179 - val_loss: 0.5362
 Epoch 712/1000
 12/12 0s 11ms/step -
 accuracy: 0.6871 - loss: 0.5626 - val_accuracy: 0.7179 - val_loss: 0.5361
 Epoch 713/1000
 12/12 0s 13ms/step -
 accuracy: 0.6931 - loss: 0.5421 - val_accuracy: 0.7179 - val_loss: 0.5360
 Epoch 714/1000
 12/12 0s 9ms/step -
 accuracy: 0.7200 - loss: 0.5358 - val_accuracy: 0.7179 - val_loss: 0.5359
 Epoch 715/1000
 12/12 0s 10ms/step -

accuracy: 0.7048 - loss: 0.5265 - val_accuracy: 0.7179 - val_loss: 0.5359
 Epoch 716/1000
 12/12 0s 9ms/step -
 accuracy: 0.7087 - loss: 0.5255 - val_accuracy: 0.7179 - val_loss: 0.5358
 Epoch 717/1000
 12/12 0s 10ms/step -
 accuracy: 0.7388 - loss: 0.5043 - val_accuracy: 0.7179 - val_loss: 0.5358
 Epoch 718/1000
 12/12 0s 9ms/step -
 accuracy: 0.7085 - loss: 0.5357 - val_accuracy: 0.7179 - val_loss: 0.5357
 Epoch 719/1000
 12/12 0s 8ms/step -
 accuracy: 0.7023 - loss: 0.5311 - val_accuracy: 0.7179 - val_loss: 0.5357
 Epoch 720/1000
 12/12 0s 7ms/step -
 accuracy: 0.6988 - loss: 0.5296 - val_accuracy: 0.7179 - val_loss: 0.5357
 Epoch 721/1000
 12/12 0s 8ms/step -
 accuracy: 0.7017 - loss: 0.5312 - val_accuracy: 0.7179 - val_loss: 0.5356
 Epoch 722/1000
 12/12 0s 8ms/step -
 accuracy: 0.7114 - loss: 0.5198 - val_accuracy: 0.7179 - val_loss: 0.5356
 Epoch 723/1000
 12/12 0s 8ms/step -
 accuracy: 0.7023 - loss: 0.5315 - val_accuracy: 0.7179 - val_loss: 0.5355
 Epoch 724/1000
 12/12 0s 13ms/step -
 accuracy: 0.7042 - loss: 0.5368 - val_accuracy: 0.7179 - val_loss: 0.5354
 Epoch 725/1000
 12/12 0s 10ms/step -
 accuracy: 0.7052 - loss: 0.5466 - val_accuracy: 0.7179 - val_loss: 0.5355
 Epoch 726/1000
 12/12 0s 9ms/step -
 accuracy: 0.6730 - loss: 0.5674 - val_accuracy: 0.7179 - val_loss: 0.5355
 Epoch 727/1000
 12/12 0s 9ms/step -
 accuracy: 0.6895 - loss: 0.5464 - val_accuracy: 0.7179 - val_loss: 0.5355
 Epoch 728/1000
 12/12 0s 10ms/step -
 accuracy: 0.7156 - loss: 0.5101 - val_accuracy: 0.7179 - val_loss: 0.5355
 Epoch 729/1000
 12/12 0s 11ms/step -
 accuracy: 0.7003 - loss: 0.5465 - val_accuracy: 0.7179 - val_loss: 0.5354
 Epoch 730/1000
 12/12 0s 9ms/step -
 accuracy: 0.7155 - loss: 0.5192 - val_accuracy: 0.7179 - val_loss: 0.5353
 Epoch 731/1000
 12/12 0s 10ms/step -

accuracy: 0.7064 - loss: 0.5255 - val_accuracy: 0.7179 - val_loss: 0.5352
 Epoch 732/1000
 12/12 0s 11ms/step -
 accuracy: 0.6728 - loss: 0.5596 - val_accuracy: 0.7179 - val_loss: 0.5352
 Epoch 733/1000
 12/12 0s 9ms/step -
 accuracy: 0.6718 - loss: 0.5576 - val_accuracy: 0.7179 - val_loss: 0.5352
 Epoch 734/1000
 12/12 0s 9ms/step -
 accuracy: 0.7085 - loss: 0.5262 - val_accuracy: 0.7179 - val_loss: 0.5350
 Epoch 735/1000
 12/12 0s 14ms/step -
 accuracy: 0.7138 - loss: 0.5187 - val_accuracy: 0.7179 - val_loss: 0.5349
 Epoch 736/1000
 12/12 0s 11ms/step -
 accuracy: 0.7053 - loss: 0.5407 - val_accuracy: 0.7179 - val_loss: 0.5349
 Epoch 737/1000
 12/12 0s 11ms/step -
 accuracy: 0.7133 - loss: 0.5212 - val_accuracy: 0.7179 - val_loss: 0.5348
 Epoch 738/1000
 12/12 0s 14ms/step -
 accuracy: 0.7385 - loss: 0.5166 - val_accuracy: 0.7179 - val_loss: 0.5347
 Epoch 739/1000
 12/12 0s 11ms/step -
 accuracy: 0.7005 - loss: 0.5333 - val_accuracy: 0.7179 - val_loss: 0.5346
 Epoch 740/1000
 12/12 0s 10ms/step -
 accuracy: 0.7218 - loss: 0.5133 - val_accuracy: 0.7179 - val_loss: 0.5345
 Epoch 741/1000
 12/12 0s 9ms/step -
 accuracy: 0.6766 - loss: 0.5536 - val_accuracy: 0.7179 - val_loss: 0.5345
 Epoch 742/1000
 12/12 0s 8ms/step -
 accuracy: 0.7157 - loss: 0.5228 - val_accuracy: 0.7179 - val_loss: 0.5344
 Epoch 743/1000
 12/12 0s 8ms/step -
 accuracy: 0.7324 - loss: 0.5174 - val_accuracy: 0.7179 - val_loss: 0.5344
 Epoch 744/1000
 12/12 0s 8ms/step -
 accuracy: 0.6902 - loss: 0.5418 - val_accuracy: 0.7179 - val_loss: 0.5344
 Epoch 745/1000
 12/12 0s 12ms/step -
 accuracy: 0.6771 - loss: 0.5470 - val_accuracy: 0.7179 - val_loss: 0.5344
 Epoch 746/1000
 12/12 0s 8ms/step -
 accuracy: 0.7112 - loss: 0.5195 - val_accuracy: 0.7179 - val_loss: 0.5345
 Epoch 747/1000
 12/12 0s 8ms/step -

accuracy: 0.7245 - loss: 0.5229 - val_accuracy: 0.7179 - val_loss: 0.5344
 Epoch 748/1000
 12/12 0s 8ms/step -
 accuracy: 0.6932 - loss: 0.5354 - val_accuracy: 0.7179 - val_loss: 0.5345
 Epoch 749/1000
 12/12 0s 8ms/step -
 accuracy: 0.6743 - loss: 0.5542 - val_accuracy: 0.7179 - val_loss: 0.5344
 Epoch 750/1000
 12/12 0s 7ms/step -
 accuracy: 0.7204 - loss: 0.5040 - val_accuracy: 0.7179 - val_loss: 0.5344
 Epoch 751/1000
 12/12 0s 7ms/step -
 accuracy: 0.7155 - loss: 0.5398 - val_accuracy: 0.7179 - val_loss: 0.5344
 Epoch 752/1000
 12/12 0s 8ms/step -
 accuracy: 0.7182 - loss: 0.5261 - val_accuracy: 0.7179 - val_loss: 0.5342
 Epoch 753/1000
 12/12 0s 8ms/step -
 accuracy: 0.6994 - loss: 0.5416 - val_accuracy: 0.7179 - val_loss: 0.5341
 Epoch 754/1000
 12/12 0s 9ms/step -
 accuracy: 0.7104 - loss: 0.5224 - val_accuracy: 0.7179 - val_loss: 0.5341
 Epoch 755/1000
 12/12 0s 9ms/step -
 accuracy: 0.7148 - loss: 0.5217 - val_accuracy: 0.7179 - val_loss: 0.5341
 Epoch 756/1000
 12/12 0s 14ms/step -
 accuracy: 0.6974 - loss: 0.5271 - val_accuracy: 0.7179 - val_loss: 0.5340
 Epoch 757/1000
 12/12 0s 8ms/step -
 accuracy: 0.7120 - loss: 0.5289 - val_accuracy: 0.7179 - val_loss: 0.5339
 Epoch 758/1000
 12/12 0s 9ms/step -
 accuracy: 0.7108 - loss: 0.5146 - val_accuracy: 0.7179 - val_loss: 0.5340
 Epoch 759/1000
 12/12 0s 9ms/step -
 accuracy: 0.7204 - loss: 0.5099 - val_accuracy: 0.7179 - val_loss: 0.5339
 Epoch 760/1000
 12/12 0s 9ms/step -
 accuracy: 0.7226 - loss: 0.5199 - val_accuracy: 0.7179 - val_loss: 0.5338
 Epoch 761/1000
 12/12 0s 9ms/step -
 accuracy: 0.7190 - loss: 0.5163 - val_accuracy: 0.7179 - val_loss: 0.5337
 Epoch 762/1000
 12/12 0s 9ms/step -
 accuracy: 0.7027 - loss: 0.5247 - val_accuracy: 0.7179 - val_loss: 0.5338
 Epoch 763/1000
 12/12 0s 18ms/step -

accuracy: 0.6947 - loss: 0.5296 - val_accuracy: 0.7179 - val_loss: 0.5338
 Epoch 764/1000
 12/12 0s 10ms/step -
 accuracy: 0.7159 - loss: 0.5197 - val_accuracy: 0.7179 - val_loss: 0.5338
 Epoch 765/1000
 12/12 0s 12ms/step -
 accuracy: 0.6846 - loss: 0.5536 - val_accuracy: 0.7179 - val_loss: 0.5337
 Epoch 766/1000
 12/12 0s 27ms/step -
 accuracy: 0.6954 - loss: 0.5332 - val_accuracy: 0.7179 - val_loss: 0.5337
 Epoch 767/1000
 12/12 0s 11ms/step -
 accuracy: 0.7133 - loss: 0.5342 - val_accuracy: 0.7179 - val_loss: 0.5336
 Epoch 768/1000
 12/12 0s 9ms/step -
 accuracy: 0.6868 - loss: 0.5310 - val_accuracy: 0.7179 - val_loss: 0.5335
 Epoch 769/1000
 12/12 0s 10ms/step -
 accuracy: 0.6736 - loss: 0.5626 - val_accuracy: 0.7179 - val_loss: 0.5335
 Epoch 770/1000
 12/12 0s 9ms/step -
 accuracy: 0.7036 - loss: 0.5432 - val_accuracy: 0.7179 - val_loss: 0.5334
 Epoch 771/1000
 12/12 0s 9ms/step -
 accuracy: 0.7086 - loss: 0.5361 - val_accuracy: 0.7179 - val_loss: 0.5333
 Epoch 772/1000
 12/12 0s 7ms/step -
 accuracy: 0.7212 - loss: 0.5212 - val_accuracy: 0.7179 - val_loss: 0.5333
 Epoch 773/1000
 12/12 0s 7ms/step -
 accuracy: 0.6970 - loss: 0.5217 - val_accuracy: 0.7179 - val_loss: 0.5333
 Epoch 774/1000
 12/12 0s 7ms/step -
 accuracy: 0.7028 - loss: 0.5248 - val_accuracy: 0.7179 - val_loss: 0.5332
 Epoch 775/1000
 12/12 0s 11ms/step -
 accuracy: 0.7198 - loss: 0.5260 - val_accuracy: 0.7179 - val_loss: 0.5331
 Epoch 776/1000
 12/12 0s 8ms/step -
 accuracy: 0.7333 - loss: 0.5080 - val_accuracy: 0.7179 - val_loss: 0.5330
 Epoch 777/1000
 12/12 0s 7ms/step -
 accuracy: 0.7097 - loss: 0.5245 - val_accuracy: 0.7179 - val_loss: 0.5329
 Epoch 778/1000
 12/12 0s 7ms/step -
 accuracy: 0.7091 - loss: 0.5335 - val_accuracy: 0.7179 - val_loss: 0.5328
 Epoch 779/1000
 12/12 0s 6ms/step -

accuracy: 0.6922 - loss: 0.5435 - val_accuracy: 0.7179 - val_loss: 0.5330
 Epoch 780/1000
 12/12 0s 7ms/step -
 accuracy: 0.7133 - loss: 0.5229 - val_accuracy: 0.7179 - val_loss: 0.5329
 Epoch 781/1000
 12/12 0s 7ms/step -
 accuracy: 0.7211 - loss: 0.5306 - val_accuracy: 0.7179 - val_loss: 0.5328
 Epoch 782/1000
 12/12 0s 7ms/step -
 accuracy: 0.7001 - loss: 0.5446 - val_accuracy: 0.7179 - val_loss: 0.5328
 Epoch 783/1000
 12/12 0s 7ms/step -
 accuracy: 0.6942 - loss: 0.5296 - val_accuracy: 0.7179 - val_loss: 0.5327
 Epoch 784/1000
 12/12 0s 7ms/step -
 accuracy: 0.6864 - loss: 0.5476 - val_accuracy: 0.7179 - val_loss: 0.5326
 Epoch 785/1000
 12/12 0s 11ms/step -
 accuracy: 0.7322 - loss: 0.5056 - val_accuracy: 0.7179 - val_loss: 0.5326
 Epoch 786/1000
 12/12 0s 7ms/step -
 accuracy: 0.6891 - loss: 0.5336 - val_accuracy: 0.7179 - val_loss: 0.5326
 Epoch 787/1000
 12/12 0s 7ms/step -
 accuracy: 0.7296 - loss: 0.5257 - val_accuracy: 0.7179 - val_loss: 0.5326
 Epoch 788/1000
 12/12 0s 6ms/step -
 accuracy: 0.7106 - loss: 0.5368 - val_accuracy: 0.7179 - val_loss: 0.5327
 Epoch 789/1000
 12/12 0s 7ms/step -
 accuracy: 0.7311 - loss: 0.5101 - val_accuracy: 0.7179 - val_loss: 0.5325
 Epoch 790/1000
 12/12 0s 7ms/step -
 accuracy: 0.6986 - loss: 0.5364 - val_accuracy: 0.7179 - val_loss: 0.5325
 Epoch 791/1000
 12/12 0s 7ms/step -
 accuracy: 0.6985 - loss: 0.5450 - val_accuracy: 0.7179 - val_loss: 0.5323
 Epoch 792/1000
 12/12 0s 7ms/step -
 accuracy: 0.7183 - loss: 0.5121 - val_accuracy: 0.7179 - val_loss: 0.5324
 Epoch 793/1000
 12/12 0s 7ms/step -
 accuracy: 0.7055 - loss: 0.5257 - val_accuracy: 0.7179 - val_loss: 0.5323
 Epoch 794/1000
 12/12 0s 11ms/step -
 accuracy: 0.7104 - loss: 0.5351 - val_accuracy: 0.7179 - val_loss: 0.5323
 Epoch 795/1000
 12/12 0s 7ms/step -

accuracy: 0.7292 - loss: 0.5073 - val_accuracy: 0.7179 - val_loss: 0.5321
 Epoch 796/1000
 12/12 0s 7ms/step -
 accuracy: 0.7100 - loss: 0.5287 - val_accuracy: 0.7179 - val_loss: 0.5320
 Epoch 797/1000
 12/12 0s 7ms/step -
 accuracy: 0.7275 - loss: 0.5274 - val_accuracy: 0.7179 - val_loss: 0.5319
 Epoch 798/1000
 12/12 0s 15ms/step -
 accuracy: 0.7049 - loss: 0.5267 - val_accuracy: 0.7179 - val_loss: 0.5318
 Epoch 799/1000
 12/12 0s 20ms/step -
 accuracy: 0.6960 - loss: 0.5338 - val_accuracy: 0.7179 - val_loss: 0.5319
 Epoch 800/1000
 12/12 0s 9ms/step -
 accuracy: 0.6927 - loss: 0.5304 - val_accuracy: 0.7179 - val_loss: 0.5319
 Epoch 801/1000
 12/12 0s 7ms/step -
 accuracy: 0.7332 - loss: 0.5158 - val_accuracy: 0.7179 - val_loss: 0.5318
 Epoch 802/1000
 12/12 0s 7ms/step -
 accuracy: 0.6810 - loss: 0.5651 - val_accuracy: 0.7179 - val_loss: 0.5318
 Epoch 803/1000
 12/12 0s 12ms/step -
 accuracy: 0.6895 - loss: 0.5440 - val_accuracy: 0.7179 - val_loss: 0.5320
 Epoch 804/1000
 12/12 0s 9ms/step -
 accuracy: 0.7051 - loss: 0.5221 - val_accuracy: 0.7179 - val_loss: 0.5321
 Epoch 805/1000
 12/12 0s 11ms/step -
 accuracy: 0.7130 - loss: 0.5262 - val_accuracy: 0.7179 - val_loss: 0.5321
 Epoch 806/1000
 12/12 0s 12ms/step -
 accuracy: 0.6979 - loss: 0.5318 - val_accuracy: 0.7179 - val_loss: 0.5321
 Epoch 807/1000
 12/12 0s 11ms/step -
 accuracy: 0.7125 - loss: 0.5217 - val_accuracy: 0.7179 - val_loss: 0.5320
 Epoch 808/1000
 12/12 0s 12ms/step -
 accuracy: 0.6959 - loss: 0.5439 - val_accuracy: 0.7179 - val_loss: 0.5318
 Epoch 809/1000
 12/12 0s 11ms/step -
 accuracy: 0.6847 - loss: 0.5432 - val_accuracy: 0.7179 - val_loss: 0.5318
 Epoch 810/1000
 12/12 0s 12ms/step -
 accuracy: 0.6701 - loss: 0.5571 - val_accuracy: 0.7179 - val_loss: 0.5317
 Epoch 811/1000
 12/12 0s 10ms/step -

accuracy: 0.7044 - loss: 0.5384 - val_accuracy: 0.7179 - val_loss: 0.5316
 Epoch 812/1000
 12/12 0s 11ms/step -
 accuracy: 0.7326 - loss: 0.5048 - val_accuracy: 0.7179 - val_loss: 0.5315
 Epoch 813/1000
 12/12 0s 10ms/step -
 accuracy: 0.7204 - loss: 0.5181 - val_accuracy: 0.7179 - val_loss: 0.5314
 Epoch 814/1000
 12/12 0s 7ms/step -
 accuracy: 0.7048 - loss: 0.5182 - val_accuracy: 0.7179 - val_loss: 0.5314
 Epoch 815/1000
 12/12 0s 7ms/step -
 accuracy: 0.7076 - loss: 0.5343 - val_accuracy: 0.7179 - val_loss: 0.5314
 Epoch 816/1000
 12/12 0s 9ms/step -
 accuracy: 0.6892 - loss: 0.5471 - val_accuracy: 0.7179 - val_loss: 0.5314
 Epoch 817/1000
 12/12 0s 7ms/step -
 accuracy: 0.7271 - loss: 0.5136 - val_accuracy: 0.7179 - val_loss: 0.5313
 Epoch 818/1000
 12/12 0s 9ms/step -
 accuracy: 0.6881 - loss: 0.5435 - val_accuracy: 0.7179 - val_loss: 0.5313
 Epoch 819/1000
 12/12 0s 13ms/step -
 accuracy: 0.7104 - loss: 0.5206 - val_accuracy: 0.7179 - val_loss: 0.5312
 Epoch 820/1000
 12/12 0s 13ms/step -
 accuracy: 0.6957 - loss: 0.5440 - val_accuracy: 0.7179 - val_loss: 0.5312
 Epoch 821/1000
 12/12 0s 11ms/step -
 accuracy: 0.7099 - loss: 0.5207 - val_accuracy: 0.7179 - val_loss: 0.5312
 Epoch 822/1000
 12/12 0s 9ms/step -
 accuracy: 0.6989 - loss: 0.5285 - val_accuracy: 0.7179 - val_loss: 0.5310
 Epoch 823/1000
 12/12 0s 12ms/step -
 accuracy: 0.6981 - loss: 0.5238 - val_accuracy: 0.7179 - val_loss: 0.5309
 Epoch 824/1000
 12/12 0s 9ms/step -
 accuracy: 0.6879 - loss: 0.5491 - val_accuracy: 0.7179 - val_loss: 0.5308
 Epoch 825/1000
 12/12 0s 10ms/step -
 accuracy: 0.7050 - loss: 0.5234 - val_accuracy: 0.7179 - val_loss: 0.5308
 Epoch 826/1000
 12/12 0s 9ms/step -
 accuracy: 0.7122 - loss: 0.5195 - val_accuracy: 0.7179 - val_loss: 0.5308
 Epoch 827/1000
 12/12 0s 8ms/step -

accuracy: 0.6855 - loss: 0.5490 - val_accuracy: 0.7179 - val_loss: 0.5309
 Epoch 828/1000
 12/12 0s 8ms/step -
 accuracy: 0.7124 - loss: 0.5205 - val_accuracy: 0.7179 - val_loss: 0.5308
 Epoch 829/1000
 12/12 0s 8ms/step -
 accuracy: 0.7000 - loss: 0.5236 - val_accuracy: 0.7179 - val_loss: 0.5307
 Epoch 830/1000
 12/12 0s 7ms/step -
 accuracy: 0.7285 - loss: 0.5029 - val_accuracy: 0.7179 - val_loss: 0.5306
 Epoch 831/1000
 12/12 0s 12ms/step -
 accuracy: 0.6875 - loss: 0.5441 - val_accuracy: 0.7179 - val_loss: 0.5307
 Epoch 832/1000
 12/12 0s 8ms/step -
 accuracy: 0.7099 - loss: 0.5203 - val_accuracy: 0.7179 - val_loss: 0.5305
 Epoch 833/1000
 12/12 0s 8ms/step -
 accuracy: 0.7193 - loss: 0.5133 - val_accuracy: 0.7179 - val_loss: 0.5305
 Epoch 834/1000
 12/12 0s 7ms/step -
 accuracy: 0.6760 - loss: 0.5527 - val_accuracy: 0.7179 - val_loss: 0.5306
 Epoch 835/1000
 12/12 0s 8ms/step -
 accuracy: 0.7042 - loss: 0.5166 - val_accuracy: 0.7179 - val_loss: 0.5305
 Epoch 836/1000
 12/12 0s 7ms/step -
 accuracy: 0.6934 - loss: 0.5337 - val_accuracy: 0.7179 - val_loss: 0.5305
 Epoch 837/1000
 12/12 0s 7ms/step -
 accuracy: 0.7283 - loss: 0.5137 - val_accuracy: 0.7179 - val_loss: 0.5302
 Epoch 838/1000
 12/12 0s 13ms/step -
 accuracy: 0.6871 - loss: 0.5480 - val_accuracy: 0.7179 - val_loss: 0.5302
 Epoch 839/1000
 12/12 0s 13ms/step -
 accuracy: 0.6810 - loss: 0.5580 - val_accuracy: 0.7179 - val_loss: 0.5302
 Epoch 840/1000
 12/12 0s 9ms/step -
 accuracy: 0.6863 - loss: 0.5436 - val_accuracy: 0.7179 - val_loss: 0.5303
 Epoch 841/1000
 12/12 0s 10ms/step -
 accuracy: 0.6942 - loss: 0.5434 - val_accuracy: 0.7179 - val_loss: 0.5303
 Epoch 842/1000
 12/12 0s 8ms/step -
 accuracy: 0.7370 - loss: 0.5068 - val_accuracy: 0.7179 - val_loss: 0.5301
 Epoch 843/1000
 12/12 0s 8ms/step -

accuracy: 0.6779 - loss: 0.5320 - val_accuracy: 0.7179 - val_loss: 0.5301
 Epoch 844/1000
 12/12 0s 7ms/step -
 accuracy: 0.7169 - loss: 0.5126 - val_accuracy: 0.7179 - val_loss: 0.5300
 Epoch 845/1000
 12/12 0s 7ms/step -
 accuracy: 0.6974 - loss: 0.5288 - val_accuracy: 0.7179 - val_loss: 0.5299
 Epoch 846/1000
 12/12 0s 7ms/step -
 accuracy: 0.7311 - loss: 0.4995 - val_accuracy: 0.7179 - val_loss: 0.5299
 Epoch 847/1000
 12/12 0s 6ms/step -
 accuracy: 0.7444 - loss: 0.4915 - val_accuracy: 0.7179 - val_loss: 0.5298
 Epoch 848/1000
 12/12 0s 7ms/step -
 accuracy: 0.7092 - loss: 0.5179 - val_accuracy: 0.7179 - val_loss: 0.5297
 Epoch 849/1000
 12/12 0s 7ms/step -
 accuracy: 0.6962 - loss: 0.5334 - val_accuracy: 0.7179 - val_loss: 0.5297
 Epoch 850/1000
 12/12 0s 10ms/step -
 accuracy: 0.6967 - loss: 0.5417 - val_accuracy: 0.7179 - val_loss: 0.5298
 Epoch 851/1000
 12/12 0s 7ms/step -
 accuracy: 0.7211 - loss: 0.5228 - val_accuracy: 0.7179 - val_loss: 0.5297
 Epoch 852/1000
 12/12 0s 8ms/step -
 accuracy: 0.7101 - loss: 0.5221 - val_accuracy: 0.7179 - val_loss: 0.5297
 Epoch 853/1000
 12/12 0s 8ms/step -
 accuracy: 0.6923 - loss: 0.5294 - val_accuracy: 0.7179 - val_loss: 0.5297
 Epoch 854/1000
 12/12 0s 8ms/step -
 accuracy: 0.6987 - loss: 0.5416 - val_accuracy: 0.7179 - val_loss: 0.5297
 Epoch 855/1000
 12/12 0s 7ms/step -
 accuracy: 0.7302 - loss: 0.5166 - val_accuracy: 0.7179 - val_loss: 0.5296
 Epoch 856/1000
 12/12 0s 7ms/step -
 accuracy: 0.7077 - loss: 0.5277 - val_accuracy: 0.7179 - val_loss: 0.5297
 Epoch 857/1000
 12/12 0s 7ms/step -
 accuracy: 0.7144 - loss: 0.5336 - val_accuracy: 0.7179 - val_loss: 0.5297
 Epoch 858/1000
 12/12 0s 7ms/step -
 accuracy: 0.6819 - loss: 0.5429 - val_accuracy: 0.7179 - val_loss: 0.5298
 Epoch 859/1000
 12/12 0s 7ms/step -

accuracy: 0.7332 - loss: 0.5069 - val_accuracy: 0.7179 - val_loss: 0.5297
 Epoch 860/1000
 12/12 0s 11ms/step -
 accuracy: 0.7135 - loss: 0.5216 - val_accuracy: 0.7179 - val_loss: 0.5294
 Epoch 861/1000
 12/12 0s 7ms/step -
 accuracy: 0.7197 - loss: 0.4999 - val_accuracy: 0.7179 - val_loss: 0.5294
 Epoch 862/1000
 12/12 0s 7ms/step -
 accuracy: 0.7007 - loss: 0.5338 - val_accuracy: 0.7179 - val_loss: 0.5295
 Epoch 863/1000
 12/12 0s 7ms/step -
 accuracy: 0.7219 - loss: 0.5271 - val_accuracy: 0.7179 - val_loss: 0.5294
 Epoch 864/1000
 12/12 0s 6ms/step -
 accuracy: 0.7192 - loss: 0.5189 - val_accuracy: 0.7179 - val_loss: 0.5293
 Epoch 865/1000
 12/12 0s 7ms/step -
 accuracy: 0.7074 - loss: 0.5224 - val_accuracy: 0.7179 - val_loss: 0.5292
 Epoch 866/1000
 12/12 0s 7ms/step -
 accuracy: 0.6878 - loss: 0.5417 - val_accuracy: 0.7179 - val_loss: 0.5292
 Epoch 867/1000
 12/12 0s 7ms/step -
 accuracy: 0.7157 - loss: 0.5258 - val_accuracy: 0.7179 - val_loss: 0.5292
 Epoch 868/1000
 12/12 0s 8ms/step -
 accuracy: 0.7083 - loss: 0.5194 - val_accuracy: 0.7179 - val_loss: 0.5292
 Epoch 869/1000
 12/12 0s 8ms/step -
 accuracy: 0.7275 - loss: 0.4955 - val_accuracy: 0.7179 - val_loss: 0.5291
 Epoch 870/1000
 12/12 0s 19ms/step -
 accuracy: 0.7152 - loss: 0.5302 - val_accuracy: 0.7179 - val_loss: 0.5291
 Epoch 871/1000
 12/12 0s 8ms/step -
 accuracy: 0.6833 - loss: 0.5605 - val_accuracy: 0.7179 - val_loss: 0.5291
 Epoch 872/1000
 12/12 0s 8ms/step -
 accuracy: 0.7408 - loss: 0.5073 - val_accuracy: 0.7179 - val_loss: 0.5289
 Epoch 873/1000
 12/12 0s 7ms/step -
 accuracy: 0.7168 - loss: 0.5086 - val_accuracy: 0.7179 - val_loss: 0.5289
 Epoch 874/1000
 12/12 0s 7ms/step -
 accuracy: 0.6962 - loss: 0.5354 - val_accuracy: 0.7179 - val_loss: 0.5289
 Epoch 875/1000
 12/12 0s 7ms/step -

accuracy: 0.6843 - loss: 0.5404 - val_accuracy: 0.7179 - val_loss: 0.5289
 Epoch 876/1000
 12/12 0s 9ms/step -
 accuracy: 0.7174 - loss: 0.5080 - val_accuracy: 0.7179 - val_loss: 0.5288
 Epoch 877/1000
 12/12 0s 7ms/step -
 accuracy: 0.7177 - loss: 0.5129 - val_accuracy: 0.7179 - val_loss: 0.5287
 Epoch 878/1000
 12/12 0s 7ms/step -
 accuracy: 0.7066 - loss: 0.5304 - val_accuracy: 0.7179 - val_loss: 0.5287
 Epoch 879/1000
 12/12 0s 10ms/step -
 accuracy: 0.6953 - loss: 0.5267 - val_accuracy: 0.7179 - val_loss: 0.5288
 Epoch 880/1000
 12/12 0s 8ms/step -
 accuracy: 0.6986 - loss: 0.5170 - val_accuracy: 0.7179 - val_loss: 0.5288
 Epoch 881/1000
 12/12 0s 8ms/step -
 accuracy: 0.7132 - loss: 0.5212 - val_accuracy: 0.7179 - val_loss: 0.5286
 Epoch 882/1000
 12/12 0s 7ms/step -
 accuracy: 0.7045 - loss: 0.5162 - val_accuracy: 0.7179 - val_loss: 0.5286
 Epoch 883/1000
 12/12 0s 7ms/step -
 accuracy: 0.6970 - loss: 0.5277 - val_accuracy: 0.7179 - val_loss: 0.5285
 Epoch 884/1000
 12/12 0s 6ms/step -
 accuracy: 0.7012 - loss: 0.5215 - val_accuracy: 0.7179 - val_loss: 0.5285
 Epoch 885/1000
 12/12 0s 7ms/step -
 accuracy: 0.7170 - loss: 0.5085 - val_accuracy: 0.7179 - val_loss: 0.5286
 Epoch 886/1000
 12/12 0s 9ms/step -
 accuracy: 0.7086 - loss: 0.5189 - val_accuracy: 0.7179 - val_loss: 0.5285
 Epoch 887/1000
 12/12 0s 15ms/step -
 accuracy: 0.6921 - loss: 0.5338 - val_accuracy: 0.7179 - val_loss: 0.5284
 Epoch 888/1000
 12/12 0s 31ms/step -
 accuracy: 0.7038 - loss: 0.5313 - val_accuracy: 0.7179 - val_loss: 0.5283
 Epoch 889/1000
 12/12 0s 9ms/step -
 accuracy: 0.7186 - loss: 0.5204 - val_accuracy: 0.7179 - val_loss: 0.5283
 Epoch 890/1000
 12/12 0s 9ms/step -
 accuracy: 0.7099 - loss: 0.5052 - val_accuracy: 0.7179 - val_loss: 0.5282
 Epoch 891/1000
 12/12 0s 9ms/step -

accuracy: 0.7081 - loss: 0.5331 - val_accuracy: 0.7179 - val_loss: 0.5282
 Epoch 892/1000
 12/12 0s 7ms/step -
 accuracy: 0.7304 - loss: 0.5122 - val_accuracy: 0.7179 - val_loss: 0.5281
 Epoch 893/1000
 12/12 0s 8ms/step -
 accuracy: 0.7070 - loss: 0.5355 - val_accuracy: 0.7179 - val_loss: 0.5280
 Epoch 894/1000
 12/12 0s 8ms/step -
 accuracy: 0.7273 - loss: 0.5013 - val_accuracy: 0.7265 - val_loss: 0.5278
 Epoch 895/1000
 12/12 0s 7ms/step -
 accuracy: 0.7041 - loss: 0.5238 - val_accuracy: 0.7179 - val_loss: 0.5278
 Epoch 896/1000
 12/12 0s 12ms/step -
 accuracy: 0.7428 - loss: 0.4850 - val_accuracy: 0.7265 - val_loss: 0.5276
 Epoch 897/1000
 12/12 0s 10ms/step -
 accuracy: 0.7142 - loss: 0.5174 - val_accuracy: 0.7179 - val_loss: 0.5277
 Epoch 898/1000
 12/12 0s 16ms/step -
 accuracy: 0.7055 - loss: 0.5344 - val_accuracy: 0.7179 - val_loss: 0.5277
 Epoch 899/1000
 12/12 0s 29ms/step -
 accuracy: 0.7170 - loss: 0.5101 - val_accuracy: 0.7265 - val_loss: 0.5275
 Epoch 900/1000
 12/12 0s 13ms/step -
 accuracy: 0.7086 - loss: 0.5101 - val_accuracy: 0.7179 - val_loss: 0.5276
 Epoch 901/1000
 12/12 0s 11ms/step -
 accuracy: 0.7123 - loss: 0.5148 - val_accuracy: 0.7179 - val_loss: 0.5276
 Epoch 902/1000
 12/12 0s 18ms/step -
 accuracy: 0.7353 - loss: 0.5052 - val_accuracy: 0.7179 - val_loss: 0.5275
 Epoch 903/1000
 12/12 0s 22ms/step -
 accuracy: 0.7142 - loss: 0.5112 - val_accuracy: 0.7179 - val_loss: 0.5275
 Epoch 904/1000
 12/12 0s 14ms/step -
 accuracy: 0.7004 - loss: 0.5346 - val_accuracy: 0.7179 - val_loss: 0.5275
 Epoch 905/1000
 12/12 0s 10ms/step -
 accuracy: 0.7083 - loss: 0.5212 - val_accuracy: 0.7179 - val_loss: 0.5276
 Epoch 906/1000
 12/12 0s 10ms/step -
 accuracy: 0.7281 - loss: 0.5206 - val_accuracy: 0.7179 - val_loss: 0.5275
 Epoch 907/1000
 12/12 0s 14ms/step -

accuracy: 0.7089 - loss: 0.5172 - val_accuracy: 0.7179 - val_loss: 0.5275
 Epoch 908/1000
 12/12 0s 22ms/step -
 accuracy: 0.7276 - loss: 0.4990 - val_accuracy: 0.7179 - val_loss: 0.5274
 Epoch 909/1000
 12/12 0s 8ms/step -
 accuracy: 0.6802 - loss: 0.5462 - val_accuracy: 0.7179 - val_loss: 0.5276
 Epoch 910/1000
 12/12 0s 8ms/step -
 accuracy: 0.7340 - loss: 0.4966 - val_accuracy: 0.7179 - val_loss: 0.5276
 Epoch 911/1000
 12/12 0s 11ms/step -
 accuracy: 0.7236 - loss: 0.5101 - val_accuracy: 0.7179 - val_loss: 0.5275
 Epoch 912/1000
 12/12 0s 8ms/step -
 accuracy: 0.7043 - loss: 0.5296 - val_accuracy: 0.7179 - val_loss: 0.5274
 Epoch 913/1000
 12/12 0s 7ms/step -
 accuracy: 0.6868 - loss: 0.5344 - val_accuracy: 0.7179 - val_loss: 0.5275
 Epoch 914/1000
 12/12 0s 7ms/step -
 accuracy: 0.7227 - loss: 0.5060 - val_accuracy: 0.7179 - val_loss: 0.5274
 Epoch 915/1000
 12/12 0s 7ms/step -
 accuracy: 0.6862 - loss: 0.5310 - val_accuracy: 0.7179 - val_loss: 0.5273
 Epoch 916/1000
 12/12 0s 7ms/step -
 accuracy: 0.7252 - loss: 0.5120 - val_accuracy: 0.7179 - val_loss: 0.5272
 Epoch 917/1000
 12/12 0s 8ms/step -
 accuracy: 0.7243 - loss: 0.5199 - val_accuracy: 0.7179 - val_loss: 0.5271
 Epoch 918/1000
 12/12 0s 7ms/step -
 accuracy: 0.7392 - loss: 0.5001 - val_accuracy: 0.7179 - val_loss: 0.5271
 Epoch 919/1000
 12/12 0s 7ms/step -
 accuracy: 0.7246 - loss: 0.5045 - val_accuracy: 0.7179 - val_loss: 0.5270
 Epoch 920/1000
 12/12 0s 7ms/step -
 accuracy: 0.7356 - loss: 0.5015 - val_accuracy: 0.7179 - val_loss: 0.5270
 Epoch 921/1000
 12/12 0s 7ms/step -
 accuracy: 0.7098 - loss: 0.5126 - val_accuracy: 0.7179 - val_loss: 0.5271
 Epoch 922/1000
 12/12 0s 10ms/step -
 accuracy: 0.7042 - loss: 0.5258 - val_accuracy: 0.7179 - val_loss: 0.5270
 Epoch 923/1000
 12/12 0s 7ms/step -

accuracy: 0.7451 - loss: 0.4956 - val_accuracy: 0.7179 - val_loss: 0.5268
 Epoch 924/1000
 12/12 0s 7ms/step -
 accuracy: 0.6795 - loss: 0.5538 - val_accuracy: 0.7179 - val_loss: 0.5268
 Epoch 925/1000
 12/12 0s 7ms/step -
 accuracy: 0.6837 - loss: 0.5536 - val_accuracy: 0.7179 - val_loss: 0.5269
 Epoch 926/1000
 12/12 0s 6ms/step -
 accuracy: 0.7281 - loss: 0.5036 - val_accuracy: 0.7179 - val_loss: 0.5268
 Epoch 927/1000
 12/12 0s 7ms/step -
 accuracy: 0.7358 - loss: 0.5055 - val_accuracy: 0.7179 - val_loss: 0.5267
 Epoch 928/1000
 12/12 0s 6ms/step -
 accuracy: 0.7176 - loss: 0.5237 - val_accuracy: 0.7265 - val_loss: 0.5264
 Epoch 929/1000
 12/12 0s 7ms/step -
 accuracy: 0.6967 - loss: 0.5255 - val_accuracy: 0.7265 - val_loss: 0.5265
 Epoch 930/1000
 12/12 0s 8ms/step -
 accuracy: 0.7154 - loss: 0.5226 - val_accuracy: 0.7179 - val_loss: 0.5265
 Epoch 931/1000
 12/12 0s 7ms/step -
 accuracy: 0.7029 - loss: 0.5161 - val_accuracy: 0.7179 - val_loss: 0.5265
 Epoch 932/1000
 12/12 0s 7ms/step -
 accuracy: 0.6939 - loss: 0.5368 - val_accuracy: 0.7179 - val_loss: 0.5265
 Epoch 933/1000
 12/12 0s 7ms/step -
 accuracy: 0.6725 - loss: 0.5385 - val_accuracy: 0.7179 - val_loss: 0.5266
 Epoch 934/1000
 12/12 0s 7ms/step -
 accuracy: 0.7049 - loss: 0.5232 - val_accuracy: 0.7179 - val_loss: 0.5268
 Epoch 935/1000
 12/12 0s 7ms/step -
 accuracy: 0.7259 - loss: 0.5137 - val_accuracy: 0.7179 - val_loss: 0.5264
 Epoch 936/1000
 12/12 0s 7ms/step -
 accuracy: 0.6993 - loss: 0.5390 - val_accuracy: 0.7179 - val_loss: 0.5263
 Epoch 937/1000
 12/12 0s 7ms/step -
 accuracy: 0.6915 - loss: 0.5418 - val_accuracy: 0.7179 - val_loss: 0.5264
 Epoch 938/1000
 12/12 0s 8ms/step -
 accuracy: 0.6918 - loss: 0.5341 - val_accuracy: 0.7179 - val_loss: 0.5263
 Epoch 939/1000
 12/12 0s 10ms/step -

accuracy: 0.7063 - loss: 0.5268 - val_accuracy: 0.7179 - val_loss: 0.5264
 Epoch 940/1000
 12/12 0s 11ms/step -
 accuracy: 0.7226 - loss: 0.5118 - val_accuracy: 0.7179 - val_loss: 0.5263
 Epoch 941/1000
 12/12 0s 12ms/step -
 accuracy: 0.6902 - loss: 0.5436 - val_accuracy: 0.7179 - val_loss: 0.5263
 Epoch 942/1000
 12/12 0s 12ms/step -
 accuracy: 0.6850 - loss: 0.5293 - val_accuracy: 0.7179 - val_loss: 0.5263
 Epoch 943/1000
 12/12 0s 11ms/step -
 accuracy: 0.7116 - loss: 0.5069 - val_accuracy: 0.7179 - val_loss: 0.5263
 Epoch 944/1000
 12/12 0s 11ms/step -
 accuracy: 0.7057 - loss: 0.5397 - val_accuracy: 0.7179 - val_loss: 0.5262
 Epoch 945/1000
 12/12 0s 8ms/step -
 accuracy: 0.6800 - loss: 0.5336 - val_accuracy: 0.7179 - val_loss: 0.5262
 Epoch 946/1000
 12/12 0s 11ms/step -
 accuracy: 0.7375 - loss: 0.4904 - val_accuracy: 0.7179 - val_loss: 0.5260
 Epoch 947/1000
 12/12 0s 9ms/step -
 accuracy: 0.7316 - loss: 0.5093 - val_accuracy: 0.7179 - val_loss: 0.5259
 Epoch 948/1000
 12/12 0s 8ms/step -
 accuracy: 0.7038 - loss: 0.5126 - val_accuracy: 0.7179 - val_loss: 0.5259
 Epoch 949/1000
 12/12 0s 8ms/step -
 accuracy: 0.7064 - loss: 0.5287 - val_accuracy: 0.7179 - val_loss: 0.5258
 Epoch 950/1000
 12/12 0s 9ms/step -
 accuracy: 0.6925 - loss: 0.5482 - val_accuracy: 0.7179 - val_loss: 0.5258
 Epoch 951/1000
 12/12 0s 9ms/step -
 accuracy: 0.7050 - loss: 0.5291 - val_accuracy: 0.7179 - val_loss: 0.5260
 Epoch 952/1000
 12/12 0s 8ms/step -
 accuracy: 0.7107 - loss: 0.5260 - val_accuracy: 0.7179 - val_loss: 0.5259
 Epoch 953/1000
 12/12 0s 9ms/step -
 accuracy: 0.7116 - loss: 0.5193 - val_accuracy: 0.7179 - val_loss: 0.5258
 Epoch 954/1000
 12/12 0s 12ms/step -
 accuracy: 0.7047 - loss: 0.5329 - val_accuracy: 0.7179 - val_loss: 0.5256
 Epoch 955/1000
 12/12 0s 9ms/step -

accuracy: 0.6828 - loss: 0.5330 - val_accuracy: 0.7265 - val_loss: 0.5255
 Epoch 956/1000
 12/12 0s 9ms/step -
 accuracy: 0.7185 - loss: 0.5013 - val_accuracy: 0.7265 - val_loss: 0.5255
 Epoch 957/1000
 12/12 0s 8ms/step -
 accuracy: 0.7053 - loss: 0.5418 - val_accuracy: 0.7350 - val_loss: 0.5254
 Epoch 958/1000
 12/12 0s 7ms/step -
 accuracy: 0.7226 - loss: 0.5154 - val_accuracy: 0.7350 - val_loss: 0.5254
 Epoch 959/1000
 12/12 0s 8ms/step -
 accuracy: 0.6989 - loss: 0.5239 - val_accuracy: 0.7179 - val_loss: 0.5256
 Epoch 960/1000
 12/12 0s 8ms/step -
 accuracy: 0.7147 - loss: 0.5090 - val_accuracy: 0.7179 - val_loss: 0.5255
 Epoch 961/1000
 12/12 0s 8ms/step -
 accuracy: 0.6926 - loss: 0.5315 - val_accuracy: 0.7179 - val_loss: 0.5255
 Epoch 962/1000
 12/12 0s 7ms/step -
 accuracy: 0.7119 - loss: 0.5078 - val_accuracy: 0.7179 - val_loss: 0.5254
 Epoch 963/1000
 12/12 0s 10ms/step -
 accuracy: 0.7365 - loss: 0.4972 - val_accuracy: 0.7179 - val_loss: 0.5253
 Epoch 964/1000
 12/12 0s 8ms/step -
 accuracy: 0.7060 - loss: 0.5225 - val_accuracy: 0.7265 - val_loss: 0.5253
 Epoch 965/1000
 12/12 0s 8ms/step -
 accuracy: 0.6952 - loss: 0.5364 - val_accuracy: 0.7350 - val_loss: 0.5251
 Epoch 966/1000
 12/12 0s 8ms/step -
 accuracy: 0.7142 - loss: 0.5096 - val_accuracy: 0.7265 - val_loss: 0.5252
 Epoch 967/1000
 12/12 0s 8ms/step -
 accuracy: 0.7027 - loss: 0.5268 - val_accuracy: 0.7179 - val_loss: 0.5252
 Epoch 968/1000
 12/12 0s 9ms/step -
 accuracy: 0.6942 - loss: 0.5140 - val_accuracy: 0.7179 - val_loss: 0.5251
 Epoch 969/1000
 12/12 0s 7ms/step -
 accuracy: 0.7097 - loss: 0.5160 - val_accuracy: 0.7265 - val_loss: 0.5251
 Epoch 970/1000
 12/12 0s 8ms/step -
 accuracy: 0.6983 - loss: 0.5254 - val_accuracy: 0.7265 - val_loss: 0.5251
 Epoch 971/1000
 12/12 0s 12ms/step -

accuracy: 0.6957 - loss: 0.5398 - val_accuracy: 0.7179 - val_loss: 0.5251
 Epoch 972/1000
 12/12 0s 8ms/step -
 accuracy: 0.6866 - loss: 0.5494 - val_accuracy: 0.7179 - val_loss: 0.5251
 Epoch 973/1000
 12/12 0s 14ms/step -
 accuracy: 0.7097 - loss: 0.5276 - val_accuracy: 0.7265 - val_loss: 0.5249
 Epoch 974/1000
 12/12 0s 8ms/step -
 accuracy: 0.7485 - loss: 0.4863 - val_accuracy: 0.7350 - val_loss: 0.5248
 Epoch 975/1000
 12/12 0s 9ms/step -
 accuracy: 0.7249 - loss: 0.5121 - val_accuracy: 0.7350 - val_loss: 0.5248
 Epoch 976/1000
 12/12 0s 15ms/step -
 accuracy: 0.7090 - loss: 0.5169 - val_accuracy: 0.7265 - val_loss: 0.5248
 Epoch 977/1000
 12/12 0s 8ms/step -
 accuracy: 0.6860 - loss: 0.5302 - val_accuracy: 0.7179 - val_loss: 0.5248
 Epoch 978/1000
 12/12 0s 15ms/step -
 accuracy: 0.7038 - loss: 0.5163 - val_accuracy: 0.7179 - val_loss: 0.5249
 Epoch 979/1000
 12/12 0s 10ms/step -
 accuracy: 0.7030 - loss: 0.5279 - val_accuracy: 0.7179 - val_loss: 0.5250
 Epoch 980/1000
 12/12 0s 8ms/step -
 accuracy: 0.7247 - loss: 0.5034 - val_accuracy: 0.7179 - val_loss: 0.5248
 Epoch 981/1000
 12/12 0s 7ms/step -
 accuracy: 0.7080 - loss: 0.5218 - val_accuracy: 0.7350 - val_loss: 0.5246
 Epoch 982/1000
 12/12 0s 6ms/step -
 accuracy: 0.7228 - loss: 0.5263 - val_accuracy: 0.7265 - val_loss: 0.5246
 Epoch 983/1000
 12/12 0s 6ms/step -
 accuracy: 0.6818 - loss: 0.5442 - val_accuracy: 0.7350 - val_loss: 0.5245
 Epoch 984/1000
 12/12 0s 7ms/step -
 accuracy: 0.7055 - loss: 0.5214 - val_accuracy: 0.7350 - val_loss: 0.5245
 Epoch 985/1000
 12/12 0s 9ms/step -
 accuracy: 0.6624 - loss: 0.5717 - val_accuracy: 0.7179 - val_loss: 0.5246
 Epoch 986/1000
 12/12 0s 8ms/step -
 accuracy: 0.7109 - loss: 0.5132 - val_accuracy: 0.7179 - val_loss: 0.5246
 Epoch 987/1000
 12/12 0s 7ms/step -

```

accuracy: 0.7040 - loss: 0.5229 - val_accuracy: 0.7179 - val_loss: 0.5248
Epoch 988/1000
12/12          0s 9ms/step -
accuracy: 0.7211 - loss: 0.5194 - val_accuracy: 0.7179 - val_loss: 0.5247
Epoch 989/1000
12/12          0s 6ms/step -
accuracy: 0.7157 - loss: 0.5247 - val_accuracy: 0.7179 - val_loss: 0.5247
Epoch 990/1000
12/12          0s 7ms/step -
accuracy: 0.6727 - loss: 0.5295 - val_accuracy: 0.7179 - val_loss: 0.5246
Epoch 991/1000
12/12          0s 6ms/step -
accuracy: 0.7143 - loss: 0.5153 - val_accuracy: 0.7179 - val_loss: 0.5246
Epoch 992/1000
12/12          0s 6ms/step -
accuracy: 0.6930 - loss: 0.5321 - val_accuracy: 0.7179 - val_loss: 0.5246
Epoch 993/1000
12/12          0s 7ms/step -
accuracy: 0.6956 - loss: 0.5237 - val_accuracy: 0.7179 - val_loss: 0.5246
Epoch 994/1000
12/12          0s 6ms/step -
accuracy: 0.7197 - loss: 0.4963 - val_accuracy: 0.7179 - val_loss: 0.5245
Epoch 995/1000
12/12          0s 7ms/step -
accuracy: 0.6951 - loss: 0.5506 - val_accuracy: 0.7179 - val_loss: 0.5245
Epoch 996/1000
12/12          0s 7ms/step -
accuracy: 0.6944 - loss: 0.5238 - val_accuracy: 0.7179 - val_loss: 0.5245
Epoch 997/1000
12/12          0s 7ms/step -
accuracy: 0.7030 - loss: 0.5365 - val_accuracy: 0.7179 - val_loss: 0.5243
Epoch 998/1000
12/12          0s 6ms/step -
accuracy: 0.7177 - loss: 0.5102 - val_accuracy: 0.7179 - val_loss: 0.5242
Epoch 999/1000
12/12          0s 6ms/step -
accuracy: 0.6887 - loss: 0.5397 - val_accuracy: 0.7179 - val_loss: 0.5243
Epoch 1000/1000
12/12          0s 6ms/step -
accuracy: 0.6925 - loss: 0.5234 - val_accuracy: 0.7179 - val_loss: 0.5242

```

```

[55]: val_acc = history.history['val_accuracy'][-1]
      print(f"Final accuracy using tanh activation function {val_acc*100:.2f}%")

```

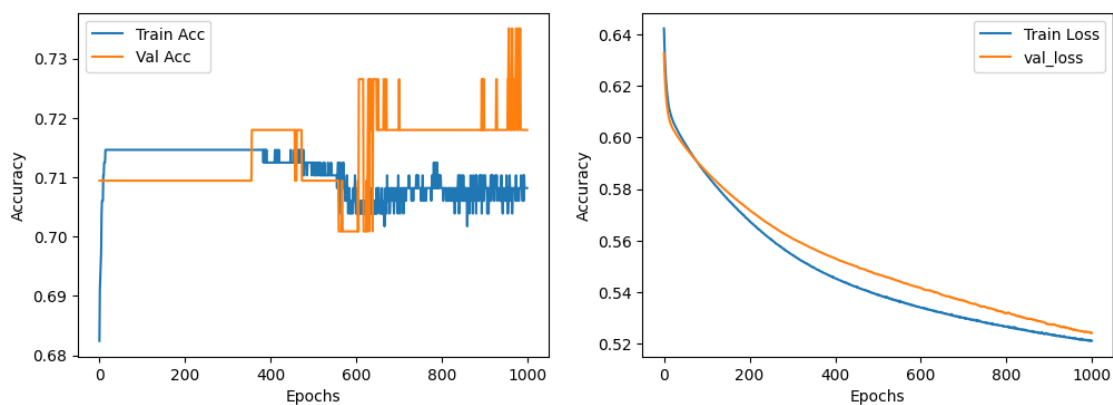
Final accuracy using tanh activation function 71.79%

```

[56]: plt.figure(figsize=(12,4))
      plt.subplot(1,2,1)

```

```
plt.plot(history.history['accuracy'], label='Train Acc')
plt.plot(history.history['val_accuracy'], label='Val Acc')
plt.xlabel('Epochs')
plt.ylabel('Accuracy')
plt.legend()
plt.subplot(1,2,2)
plt.plot(history.history['loss'], label='Train Loss')
plt.plot(history.history['val_loss'], label = 'val_loss')
plt.xlabel('Epochs')
plt.ylabel('Accuracy')
plt.legend()
plt.show()
```



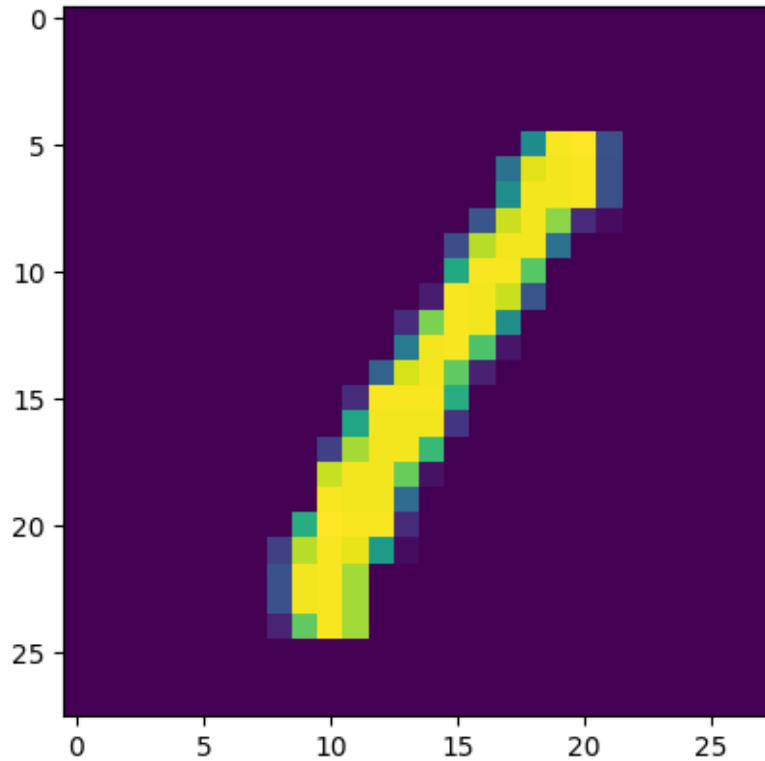
activation function	batch size	accuracy
sigmoid	50	70.94%
relu	25	75.21%
tanh	40	71.79%

0.6.3 Question:6 Next let us try a multi class classification problem where we will work with the mnist dataset. It constains 70000 handwritten images of digits from 0 to 9. So its a 10 class classification problem. Lets try to create a model that can do the classification task.

```
[58]: import keras
from keras.datasets import mnist
from keras.models import Sequential
from keras.layers import Dense, Flatten
from keras.optimizers import SGD
import matplotlib.pyplot as plt

batch_size = 128
num_classes = 10
```

```
epochs = 10
(x_train,y_train), (x_test,y_test) = mnist.load_data()
plt.imshow(x_train[3])
plt.show()
```



0.6.4 Converting all the values in the array in the range of 0 to 1 for better training by the neural network.

```
[61]: x_train = x_train/255
      x_test = x_test/255
```

0.6.5 Making the artificial neural network

```
[63]: model = Sequential()
      model.add(Flatten(input_shape = (28,28)))
      model.add(Dense(128, activation = 'relu'))
      model.add(Dense(32, activation = 'relu'))
      model.add(Dense(10, activation = 'softmax'))
```

```
[64]: model.summary()
```

Model: "sequential_6"

Layer (type)	Output Shape	Param #
flatten (Flatten)	(None, 784)	0
dense_10 (Dense)	(None, 128)	100,480
dense_11 (Dense)	(None, 32)	4,128
dense_12 (Dense)	(None, 10)	330

Total params: 104,938 (409.91 KB)

Trainable params: 104,938 (409.91 KB)

Non-trainable params: 0 (0.00 B)

```
[65]: model.compile(loss = 'sparse_categorical_crossentropy',  
    ↪optimizer='Adam',metrics=['accuracy'])
```

```
[66]: history = model.fit(x_train,y_train, batch_size = batch_size, epochs = 10,  
    ↪validation_split=0.2, verbose=1)
```

Epoch 1/10

375/375 8s 17ms/step -

accuracy: 0.7943 - loss: 0.7277 - val_accuracy: 0.9421 - val_loss: 0.1978

Epoch 2/10

375/375 1s 4ms/step -

accuracy: 0.9448 - loss: 0.1882 - val_accuracy: 0.9547 - val_loss: 0.1539

Epoch 3/10

375/375 2s 5ms/step -

accuracy: 0.9632 - loss: 0.1266 - val_accuracy: 0.9652 - val_loss: 0.1168

Epoch 4/10

375/375 2s 5ms/step -

accuracy: 0.9728 - loss: 0.0910 - val_accuracy: 0.9667 - val_loss: 0.1084

Epoch 5/10

375/375 2s 6ms/step -

accuracy: 0.9789 - loss: 0.0722 - val_accuracy: 0.9702 - val_loss: 0.0984

Epoch 6/10

375/375 3s 9ms/step -

accuracy: 0.9826 - loss: 0.0579 - val_accuracy: 0.9709 - val_loss: 0.0962

Epoch 7/10

```

375/375          2s 5ms/step -
accuracy: 0.9861 - loss: 0.0471 - val_accuracy: 0.9691 - val_loss: 0.1031
Epoch 8/10
375/375          2s 4ms/step -
accuracy: 0.9884 - loss: 0.0392 - val_accuracy: 0.9750 - val_loss: 0.0850
Epoch 9/10
375/375          2s 5ms/step -
accuracy: 0.9909 - loss: 0.0320 - val_accuracy: 0.9722 - val_loss: 0.0944
Epoch 10/10
375/375          2s 5ms/step -
accuracy: 0.9927 - loss: 0.0266 - val_accuracy: 0.9760 - val_loss: 0.0911

```

```
[68]: y_prob = model.predict(x_test)
      y_pred = y_prob.argmax(axis = 1)
```

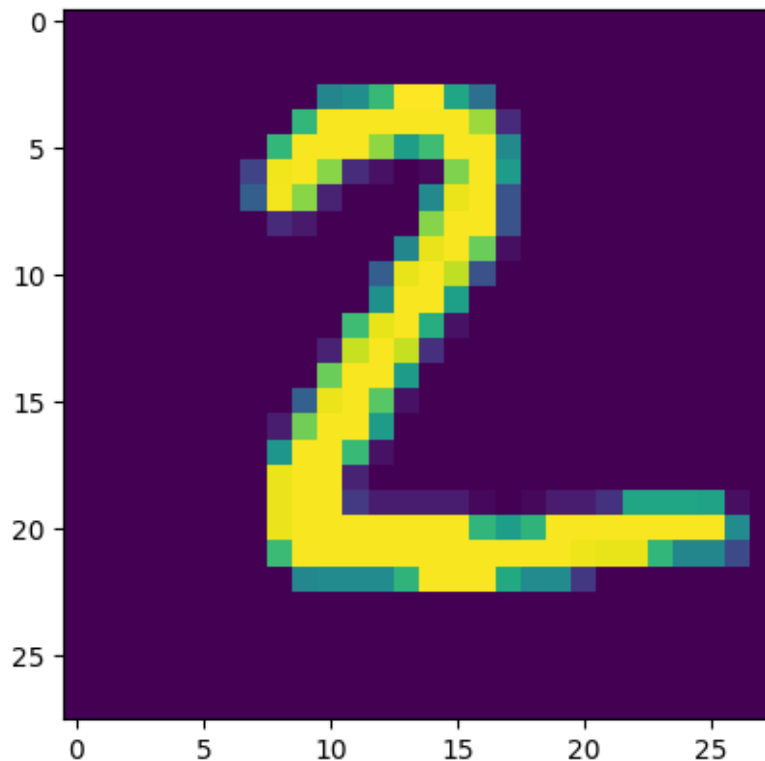
```
313/313          0s 1ms/step
```

```
[69]: from sklearn.metrics import accuracy_score
      print(f"Accuracy:{accuracy_score(y_test,y_pred)*100:.2f}%")
```

Accuracy:97.39%

0.6.6 Checking the results

```
[70]: plt.imshow(x_test[1])
      plt.show()
```



```
[71]: model.predict(x_test[1].reshape(1,28,28)).argmax(axis = 1)
```

```
1/1          0s 87ms/step
```

```
[71]: array([2])
```

0.7 Question:4 Next our task is to write a scratch code for a simple feed forward network that does a task. This model has inputs as [0, 0, 1], [0, 1, 1], [1, 0, 1], [1, 1, 1] and the expected output as [0], [1], [1], [0] in each case. So there are three features in our dataset as you see above. The activation function is to be taken as sigmoid. The architecture is like we have only one hidden layer and an output layer with one neuron. Take the error function as $(1/2)(y - y^2)^2$

```
[72]: import numpy as np

# sigmoid activation function
def sigmoid(x):
    return 1 / (1 + np.exp(-x))

# derivative of sigmoid function
def sigmoid_derivative(x):
    return x*(1-x)

# mean squared error loss
def mse_loss(y_true,y_pred):
    return 0.5*np.mean((y_true-y_pred)**2)

# Input dataset (XOR gate inputs with bias term)
x = np.array([[0,0,1],
              [0,1,1],
              [1,0,1],
              [1,1,1]])

# output labels
y = np.array([[0],
              [1],
              [1],
              [0]])

# seed for reproducibility
np.random.seed(1)

# Initialize weights randomly with mean 0
```



```

input_size = 3 # 3 input features
hidden_size = 2 # 2 hidden layers
output_size = 1 # 1 output neuron

# Weights
w1 = 2 * np.random.random((input_size, hidden_size))-1
w2 = 2 * np.random.random((hidden_size, output_size))-1

# Biases
b1 = np.zeros((1, hidden_size))
b2 = np.zeros((1, output_size))

# Learning rate
lr = 0.1

# Training loop
for epoch in range(10000):

    ##----- Forward pass -----
    a1 = np.dot(x,w1) + b1
    h1 = sigmoid(a1) # activation of hidden layer

    a2 = np.dot(h1,w2) + b2
    output = sigmoid(a2) # final prediction

    # loss calculation
    loss = mse_loss(y,output)

    ##----- Back propagation -----
    # output layer error
    output_error = output - y
    output_delta = output_error * sigmoid_derivative(output)

    ## hidden layer error
    hidden_error = np.dot(output_delta, w2.T)
    hidden_delta = hidden_error * sigmoid_derivative(h1)

    ##-----Updating weights and biases -----
    w2 -= lr * np.dot(h1.T,output_delta)
    b2 -= lr * np.sum(output_delta, axis = 0, keepdims = True)

    w1 -= lr * np.dot(x.T, hidden_delta)
    b1 -= lr * np.sum(hidden_delta, axis = 0, keepdims = True)

    # Print loss every 1000 epochs
    if epoch % 1000 == 0:
        print(f"Epoch {epoch}, Loss: {loss:.4f}")

```

```
# ----- Final Output -----  
print("\nFinal predictions after training:")  
print(output.round(3))
```

```
Epoch 0, Loss: 0.1267  
Epoch 1000, Loss: 0.1215  
Epoch 2000, Loss: 0.1029  
Epoch 3000, Loss: 0.0905  
Epoch 4000, Loss: 0.0828  
Epoch 5000, Loss: 0.0433  
Epoch 6000, Loss: 0.0105  
Epoch 7000, Loss: 0.0049  
Epoch 8000, Loss: 0.0031  
Epoch 9000, Loss: 0.0022
```

```
Final predictions after training:  
[[0.049]  
 [0.945]  
 [0.945]  
 [0.071]]
```

```
[73]: y_pred_binary = (output > 0.5).astype(int)  
print("Predicted labels:", y_pred_binary.ravel())  
print("True labels:      ", y.ravel())
```

```
Predicted labels: [0 1 1 0]  
True labels:      [0 1 1 0]
```