

```

import numpy as np
from keras.models import Sequential
from keras.layers import Dense
# XOR input data
X = np.array([[0, 0], [0, 1], [1, 0], [1, 1]])
# Corresponding XOR output data
Y = np.array([[0], [1], [1], [0]])
# Create a sequential model
model = Sequential()
# Add a hidden layer with 8 neurons and 'relu' activation function
model.add(Dense(8, input_dim=2, activation='relu'))
# Add the output layer with 1 neuron and 'sigmoid' activation function
model.add(Dense(1, activation='sigmoid'))
# Compile the model using binary cross-entropy loss and Adam optimizer
model.compile(loss='binary_crossentropy', optimizer='adam', metrics=['accuracy'])
# Train the model for 1000 epochs
model.fit(X, Y, epochs=10)
# Evaluate the model
loss, accuracy = model.evaluate(X, Y)
print(f"Loss: {loss:.4f}, Accuracy: {accuracy:.4f}")
# Make predictions
predictions = model.predict(X)
rounded_predictions = np.round(predictions)
print("Predictions:")
print(rounded_predictions)

```

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```
# Make predictions
predictions = model.predict(X)
rounded_predictions = np.round(predictions)
print("Predictions:")
print(rounded_predictions)
```

Epoch 1/10  
1/1 [=====] - 1s 644ms/step - loss: 0.7093 - accuracy: 0.7500  
Epoch 2/10  
1/1 [=====] - 0s 12ms/step - loss: 0.7090 - accuracy: 0.5000  
Epoch 3/10  
1/1 [=====] - 0s 12ms/step - loss: 0.7087 - accuracy: 0.5000  
Epoch 4/10  
1/1 [=====] - 0s 13ms/step - loss: 0.7084 - accuracy: 0.5000  
Epoch 5/10  
1/1 [=====] - 0s 13ms/step - loss: 0.7081 - accuracy: 0.5000  
Epoch 6/10  
1/1 [=====] - 0s 12ms/step - loss: 0.7078 - accuracy: 0.5000  
Epoch 7/10  
1/1 [=====] - 0s 11ms/step - loss: 0.7075 - accuracy: 0.5000  
Epoch 8/10  
1/1 [=====] - 0s 10ms/step - loss: 0.7073 - accuracy: 0.5000  
Epoch 9/10  
1/1 [=====] - 0s 10ms/step - loss: 0.7070 - accuracy: 0.5000  
Epoch 10/10  
1/1 [=====] - 0s 10ms/step - loss: 0.7067 - accuracy: 0.5000  
WARNING:tensorflow:5 out of the last 5 calls to <function Model.make\_test\_function.<locals>.test\_function at 0x78151f4430a0> triggered tf.function retracing. Tracing is expensive and the excess calls will be slow.  
1/1 [=====] - 0s 139ms/step - loss: 0.7064 - accuracy: 0.5000  
Loss: 0.7064, Accuracy: 0.5000  
WARNING:tensorflow:5 out of the last 5 calls to <function Model.make\_predict\_function.<locals>.predict\_function at 0x7815c0e9f1c0> triggered tf.function retracing. Tracing is expensive and the excess calls will be slow.  
1/1 [=====] - 0s 54ms/step  
Predictions:  
[[1.]  
 [0.]  
 [1.]]

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