```
import tensorflow as tf
import numpy as np

# Tworzymy dane treningowe
def generate_data(num_samples=1000):
    X = np.random.randint(0, 2, size=(num_samples, 16, 2))  # 
Generujemy dwie liczby binarne o długości 16 bitów
    Y = np.abs(X[:, :, 0] - X[:, :, 1])  # Obliczamy różnicę dwóch 
liczb binarnych
    return X, Y

# Tworzymy model RNN
model = tf.keras.Sequential([
    tf.keras.layers.SimpleRNN(8, input_shape=(16, 2), 
activation='relu', return_sequences=True),
    tf.keras.layers.SimpleRNN(8, activation='relu'),
    tf.keras.layers.Dense(16, activation='sigmoid')
])

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

# Generujemy dane treningowe
X_train, Y_train = generate_data()

# Trenujemy model
model.fit(X_train, Y_train, epochs=10, batch_size=32)

# Testujemy model na nowych danych
X_test, Y_test = generate_data(10)
predictions = model.predict(X_test)

# Wyświetlamy wyniki
for i in range(10):
    input_data = X_test[i]
    true_output = Y_test[i]
    predicted_output = predictions[i].round()

    print(f"Wejście: {input_data}")
    print(f"Prawdziwa różnica: {true_output}")
    print(f"Przewidziana różnica: {predicted_output}")
    print()

WARNING:tensorflow:From c:\Python39\lib\site-packages\keras\src\
losses.py:2976: The name tf.losses.sparse_softmax_cross_entropy is 
deprecated. Please use 
tf.compat.v1.losses.sparse_softmax_cross_entropy instead.

WARNING:tensorflow:From c:\Python39\lib\site-packages\keras\src\
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layers\rnn\simple_rnn.py:130: The name
tf.executing_eagerly_outside_functions is deprecated. Please use
tf.compat.v1.executing_eagerly_outside_functions instead.

WARNING:tensorflow:From c:\Python39\lib\site-packages\keras\src\
optimizers\__init__.py:309: The name tf.train.Optimizer is deprecated.
Please use tf.compat.v1.train.Optimizer instead.

Epoch 1/10
WARNING:tensorflow:From c:\Python39\lib\site-packages\keras\src\utils\
tf_utils.py:492: The name tf.ragged.RaggedTensorValue is deprecated.
Please use tf.compat.v1.ragged.RaggedTensorValue instead.

WARNING:tensorflow:From c:\Python39\lib\site-packages\keras\src\
engine\base_layer_utils.py:384: The name
tf.executing_eagerly_outside_functions is deprecated. Please use
tf.compat.v1.executing_eagerly_outside_functions instead.

32/32 [==============================] - 2s 4ms/step - loss: 0.7053 -
accuracy: 0.0160
Epoch 2/10
32/32 [==============================] - 0s 4ms/step - loss: 0.6957 -
accuracy: 0.0450
Epoch 3/10
32/32 [==============================] - 0s 4ms/step - loss: 0.6939 -
accuracy: 0.0720
Epoch 4/10
32/32 [==============================] - 0s 4ms/step - loss: 0.6929 -
accuracy: 0.0790
Epoch 5/10
32/32 [==============================] - 0s 4ms/step - loss: 0.6921 -
accuracy: 0.0730
Epoch 6/10
32/32 [==============================] - 0s 4ms/step - loss: 0.6914 -
accuracy: 0.0830
Epoch 7/10
32/32 [==============================] - 0s 4ms/step - loss: 0.6907 -
accuracy: 0.0900
Epoch 8/10
32/32 [==============================] - 0s 4ms/step - loss: 0.6900 -
accuracy: 0.0970
Epoch 9/10
32/32 [==============================] - 0s 4ms/step - loss: 0.6890 -
accuracy: 0.1060
Epoch 10/10
32/32 [==============================] - 0s 5ms/step - loss: 0.6878 -
accuracy: 0.0980
1/1 [==============================] - 0s 346ms/step
Wejście: [[0 0]
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