!pip install scikit-learn tensorflow matplotlib --quiet

import numpy as np

import pandas as pd

from sklearn.ensemble import IsolationForest, RandomForestClassifier

from sklearn.metrics import classification\_report

from tensorflow.keras.models import Sequential

from tensorflow.keras.layers import LSTM, Dense

# Synthetic blockchain dataset

np.random.seed(42)

n\_samples = 1000

data = pd.DataFrame({

"tx\_volume": np.random.poisson(10, n\_samples),

"gas\_used": np.random.normal(20000, 5000, n\_samples),

"contract\_calls": np.random.poisson(3, n\_samples),

"network\_latency": np.random.normal(50, 10, n\_samples),

"anomaly\_score": np.random.uniform(0, 1, n\_samples),

})

labels = np.random.choice([0,1], size=n\_samples, p=[0.9,0.1]) # 0=Normal, 1=Threat

# Train Isolation Forest for anomaly detection

iso = IsolationForest(contamination=0.1, random\_state=42)

iso.fit(data)

preds = iso.predict(data)

# Convert predictions (-1=anomaly, 1=normal) to binary

preds = [1 if p == -1 else 0 for p in preds]

print(classification\_report(labels, preds))