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import numpy as np
from scipy.spatial import distance

# Node A and B data
node_A = np.array([[1, 2], [2, 3], [3, 4]])
node_B = np.array([[5, 5], [6, 6], [7, 7]])

# Test point
test_point = np.array([3, 3])
# test_point = np.array([1, 1])

def mahalanobis_outlier(data, point):
    mean_vec = np.mean(data, axis=0)
    cov_matrix = np.cov(data.T)

    # Use pseudo-inverse to avoid singular matrix error
    inv_cov_matrix = np.linalg.pinv(cov_matrix)

    dist = distance.mahalanobis(point, mean_vec, inv_cov_matrix)
    return dist

# Mahalanobis distances
dist_A = mahalanobis_outlier(node_A, test_point)
dist_B = mahalanobis_outlier(node_B, test_point)

# Print results
print("Mahalanobis Distance from Node A:", dist_A)
print("Mahalanobis Distance from Node B:", dist_B)

# Threshold check (common threshold  $\approx 3$  for 2D)
threshold = 3
print("\nOutlier with respect to Node A?", dist_A > threshold)
print("Outlier with respect to Node B?", dist_B > threshold)

```