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import numpy as np
from numpy.linalg import norm
from scipy.spatial.distance import cdist

a = np.array([1, -2, 16, 40, 0])
b = np.array([3.16, 25, -3, -6.5, 108])

c = a - b

normC = norm(c, ord=2)
normA = norm(a, ord=2)
normB = norm(b, ord=2)
normA_B = norm((a-b), ord=2)
metricA_B = cdist(a[np.newaxis, :], b[np.newaxis, :],
metric='euclidean')

dotAB = np.dot(a,b)

cos_angle = dotAB / (normA * normB)
angle = np.arccos(cos_angle)

print(normC)
122.1511997485084

print(normA)
43.139309220245984

print(normB)
111.13161386392262

print(normA_B)
122.1511997485084

print(metricA_B)
[[122.15119975]]

print(dotAB)
-354.84000000000003

print(cos_angle)
-0.07401534413719323

print(angle)
1.6448794174297847

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