Haonan Hu

3/11/2021

2863545

1. If A = ([[1,2,3],

[3,4,5],

[6,7,8]]), what is the X_centered array?

M = [3.3, 4.3, 5.3]

C = [[-2.3, -2.3, -2.3],

[-0.3, -0.3, -0.3],

[2.7, 2.7, 2.7]]

2. If the covariance array of the X_centered array is:

([[6.33, 4.33, -3.33], [4.33, 7.23, -5.12], [-3.33, -5.12, 4.89]]):

a) What is the variance of the 1st input feature?

6.33

b) What is the covariance between the 1st and 2nd features?

4.33

3. If the eigenvalues are:
   [4.22484077 0.24224357 0.07852391 0.02368303]

   and the eigenvectors are:
   [[0.36158968 -0.08226889 0.85657211 0.35884393]
   [0.65653988 0.72971237 -0.1757674 -0.07470647]
   [-0.58099728 0.59641809 0.07252408 0.54906091]
   [0.31725455 -0.32409435 -0.479718990.75112056]]

   List the eigenvector(s) you need for a PoV > 0.97.

   PoV = (4.22484077 + 0.24224357) / (4.22484077 + 0.24224357 + 0.07852391 + 0.02368303) = 0.977 > 0.97

   So using first 2 eigenvectors of feature 1 and feature 2.