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import pandas as pd
import numpy as np

a = np.array([[4,0],[3,-5]])
b = a.T
b

array([[ 4,  3],
       [ 0, -5]])

c = np.dot(b,a)
c

array([[ 25, -15],
       [-15,  25]])

eigenvalues,eigenvector = np.linalg.eig(c)
print(eigenvalues)
print(eigenvector)

[40. 10.]
[[ 0.70710678  0.70710678]
 [-0.70710678  0.70710678]]

idx = eigenvalues.argsort()[::-1]
eigenvalues = eigenvalues[idx]
eigenvector = eigenvector[:,idx]
print(eigenvalues)
print(eigenvector)

[40. 10.]
[[ 0.70710678  0.70710678]
 [-0.70710678  0.70710678]]

s = np.diag(np.sqrt(eigenvalues))
v = eigenvector
print(v.T)
print(s)

[[ 0.70710678 -0.70710678]
 [ 0.70710678  0.70710678]]
[[6.32455532 0.
   ]
 [0.        3.16227766]]

u = np.dot(a,np.dot(v,np.linalg.inv(s)))
u

array([[ 0.4472136 ,  0.89442719],
       [ 0.89442719, -0.4472136 ]])

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Start coding or [generate](#) with AI.

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