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main

-linear-algebra-2 / ex03_evalue+evector_jpynb.ipynb

leeyh1011 Colaboratory를 통해 생성됨

1 contributor

160 lines (160 sloc) | 4.29 KB

Open in Colab

Part 1. Eigen values & Eigen vectors

0. Import libraries

In [ ]:
```
import numpy as np
import numpy.linalg as npl #Linear Algebra
import matplotlib.pyplot as plt
```

< eigen values & eigen vectors of A >

$$Au = \lambda u$$

In [ ]:
```
A = np. array([[4, 2], [1, 3]])
print("A:")
print(A, "₩n")

e_values, e_vectors = npl.eig(A)
print("A의 고윳값 = ", e_values)
print("A의 고유벡터 = ", e_vectors)

# eigen vector u1, u2
u1 = np.vstack(e_vectors[:, 0])
u2 = np.vstack(e_vectors[:, 1])
print("u1: ", u1)
print("u2: ", u2)

# eigen value lamda1, lamda2
l1, l2 = e_values[0], e_values[1]
print("eigen values: ", l1, l2, "₩n")

# Check
print("Au1: ", np.dot(A, u1))
print("l1*u1: ", l1*u1)

print("Au2: ", np.dot(A, u2))
print("l2*u2: ", l2*u2)
```

```
A:
[[4 2]
 [1 3]] 

A의 고윳값 =  [5. 2.]
A의 고유벡터 =  [[ 0.89442719 -0.70710678]
 [ 0.4472136   0.70710678]]
u1:  [[0.89442719]
 [0.4472136 ]]
u2:  [[-0.70710678]
 [ 0.70710678]]
eigen values:  5.0 2.0 

Au1:  [[4.47213595]
```

```
 [2.23606798]]
l1*u1:  [[4.47213595]
 [2.23606798]]
Au2:  [[-1.41421356]
 [ 1.41421356]]
l2*u2:  [[-1.41421356]
 [ 1.41421356]]
```

In [ ]:

```
B = np.array([[5,2,0],[2,5,0,],[-3,4,6]])
w2,V2 = np.linalg.eig(B)

print("WnB의 고윳값 = ", w2)
print("B의 고유벡터 = ", V2)
```

```
B의 고윳값 =  [6. 7. 3.]
B의 고유벡터 =  [[ 0.          0.57735027  0.36650833]
 [ 0.          0.57735027 -0.36650833]
 [ 1.          0.57735027  0.85518611]]
```