Algebra_Lineal_220325

March 22, 2025

[2]:
```
import numpy as np
```

[3]:
```
# Creando una lista normal de python
v1 = [2,4,6]
```

[4]:
```
# Creando un arrgelo/vector de numpy
v2 = np.array([2,4,6])
```

[5]:
```
type(v1)
```

[5]:
```
list
```

[6]:
```
type(v2)
```

[6]:
```
numpy.ndarray
```

[7]:
```
# Crea un vector con unos, del tamaño que yo le indique en el argumento
v3 = np.ones(3)
v3
```

[7]:
```
array([1., 1., 1.])
```

[8]:
```
# Crear un vector dentro de un rango especificado (inicio, fin (hasta antes de))
v4 = np.arange(1,8)
v4
```

[8]:
```
array([1, 2, 3, 4, 5, 6, 7])
```

[9]:
```
# suma con listas de python
v5 = [1,2,3,4]
v6 = [5,6,7,8]
```

[10]:
```
v5+v6
```

[10]:
```
[1, 2, 3, 4, 5, 6, 7, 8]
```

[15]:
```
v5-v6
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[15], line 1
----> 1 v5-v6

TypeError: unsupported operand type(s) for -: 'list' and 'list'
```

[18]:
```
v5 * 7
```

[18]:
```
[1,
 2,
 3,
 4,
 1,
 2,
 3,
 4,
 1,
 2,
 3,
 4,
 1,
 2,
 3,
 4,
 1,
 2,
 3,
 4,
 1,
 2,
 3,
 4,
 1,
 2,
 3,
 4]
```

[13]:
```
#suma con arreglos/vectores de numpy
v7 = np.array([1,2,3,4])
v8 = np.array([5,6,7,8])
```

[14]:
```
v7+v8
```

[14]:
```
array([ 6,  8, 10, 12])
```

[17]:
```
#resta
v7-v8
```

[17]:
```
array([-4, -4, -4, -4])
```

[19]:
```
# multiplicación
v7*7
```

[19]:
```
array([ 7, 14, 21, 28])
```

[21]:
```
# Producto punto, escalar o interior

x = np.array([1,2,3])
y = np.array([4,5,6])

sum(x*y)
```

[21]:
```
32
```

[22]:
```
np.dot(x,y)
```

[22]:
```
32
```

[23]:
```
#Calculando la norma

x1 = np.array([1,2,3,4])
np.linalg.norm(x1)
```

[23]:
```
5.477225575051661
```

[26]:
```
# Operaciones con matrices

A = np.array([[1,3,2],
              [1,0,0],
              [1,2,2]])
A
```

[26]:
```
array([[1, 3, 2],
       [1, 0, 0],
       [1, 2, 2]])
```

[27]:
```
# Multiplicación por escalar
A * 2
```

[27]:
```
array([[2, 6, 4],
       [2, 0, 0],
       [2, 4, 4]])
```

[28]:
```
B = np.array([[1,0,5],
              [7,5,0],
              [2,1,1]])
```

[29]:
```
# Suma de matrices
A + B
```

[29]:
```
array([[2, 3, 7],
       [8, 5, 0],
       [3, 3, 3]])
```

[30]:
```
# Resta de matrices
A - B
```

[30]:
```
array([[ 0,  3, -3],
       [-6, -5,  0],
       [-1,  1,  1]])
```

[31]:
```
# Para ver la dimensión de una matriz
A.shape
```

[31]:
```
(3, 3)
```

[32]:
```
# Para ver la cantidad de elementos
A.size
```

[32]:
```
9
```

[33]:
```
# Multiplicación de matrices

A1 = np.arange(1,13).reshape(3,4)
A1
```

[33]:
```
array([[ 1,  2,  3,  4],
       [ 5,  6,  7,  8],
       [ 9, 10, 11, 12]])
```

[34]:
```
B1 = np.arange(8).reshape(4,2)
B1
```

[34]:
```
array([[0, 1],
       [2, 3],
       [4, 5],
       [6, 7]])
```

[35]:
```
A1 @ B1
```

[35]:
```
array([[ 40,  50],
       [ 88, 114],
       [136, 178]])
```

[36]:
```
B1 @ A1
```

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
Cell In[36], line 1
----> 1 B1 @ A1

ValueError: matmul: Input operand 1 has a mismatch in its core dimension 0, wit
 ↪gufunc signature (n?,k),(k,m?)->(n?,m?) (size 3 is different from 2)
```

[ ]:
```

```