

Agenda

- * ✓ Sorting
- * ✓ Matrix Multiplication
- * ✓ Vectorization
- * ✓ 3D- Indexing, slicing
- * Usecase : Image Manipulation
 - ✓ Change color
 - ✓ Rotate an Image
 - ✓ Crop / trim an Image
 - ✓ Save Image
- * Shallow copy vs Deepcopy

Cursor selected

Assignments

```

graph LR
    A[TA] --- B[Friends]
    A --- C((Me))
    
```

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Sorting

axis=1

`np.sort(a, axis=1)`

default
axis

(↓ ↓ ↓) >

Snapshot saved.

Matrix Multiplication ✓

$A = \begin{bmatrix} 0 & 1 & 2 & 3 \\ 4 & 5 & 6 & 7 \\ 8 & 9 & 10 & 11 \end{bmatrix}$

$B = \begin{bmatrix} 0 & 1 & 2 & 3 \\ 4 & 5 & 6 & 7 \\ 8 & 9 & 10 & 11 \end{bmatrix}$

$\cdot \begin{matrix} 3 \\ 4 \end{matrix}$

$C = \begin{bmatrix} 0 & 4 & 8 \\ 1 & 5 & 9 \\ 2 & 6 & 10 \\ 3 & 7 & 11 \end{bmatrix}$

$C^T = \begin{bmatrix} 0 & 1 & 2 & 3 \\ 4 & 5 & 6 & 7 \\ 8 & 9 & 10 & 11 \end{bmatrix}$

The diagram illustrates two concepts: Vectorization and map().

Vectorization: A green bracket labeled "math" points to a circled expression $\log(1)$. An arrow from this expression points to a large oval containing a sequence of numbers: $[1, 2, 3, \dots, 10]$. Below the sequence, individual elements are labeled $\log(1), \log(2), \log(3), \dots, \log(10)$, showing that the function is applied element-wise to the entire range.

map(): A blue bracket labeled "map()" points to a list of integers $[1, 2, 3, 4, 5]$. Above the list, a circled "x" is labeled $x = \text{input}()$. A pink bracket labeled "map(int)" points to the list. An arrow from this label points to a circled "x" with a "split" arrow pointing to the list $[1, 2, 3, 4, 5]$.









