



BATCH :

B150 Data Science

LESSON :

**NUMPY**

DATE :

31.03.2023

SUBJECT :

**Session 2**

## NumPy Arrays & Methods

ZOOM GİRİŞLERİNİZİ LÜTFEN **LMS** SİSTEMİ ÜZERİNDEN YAPINIZ



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# Scalars, Vectors and Matrices

And when we include matrices we get this interesting pattern:

- A **scalar** is a number, like 3, -5, 0,368, etc,
- A **vector** is a **list** of numbers (can be in a row or column),
- A **matrix** is an **array** of numbers (one or more rows, one or more columns).

Scalar

24

Vector

$\begin{bmatrix} 2 & -8 & 7 \end{bmatrix}$

row

or  
column  $\begin{bmatrix} 2 \\ -8 \\ 7 \end{bmatrix}$

Matrix

$\begin{bmatrix} 6 & 4 & 24 \\ 1 & -9 & 8 \end{bmatrix}$

row(s) × column(s)



In fact a **vector is also a matrix**! Because a matrix can have just one row or one column.

So the rules that work for matrices also work for vectors.



# Numpy

## Neden NumPy Kullanılır?

- Daha hızlı
- Daha az döngü
- Daha açık kod
- Daha kaliteli kod



***NumPy***



# NumPy

## NumPy Neden Listelerden Daha Hızlı?

- Bellek yönetimi
- Vektörel işlemler
- Dahili fonksiyonlar
- C veya C ++ dilinde yazılmış alt yapı



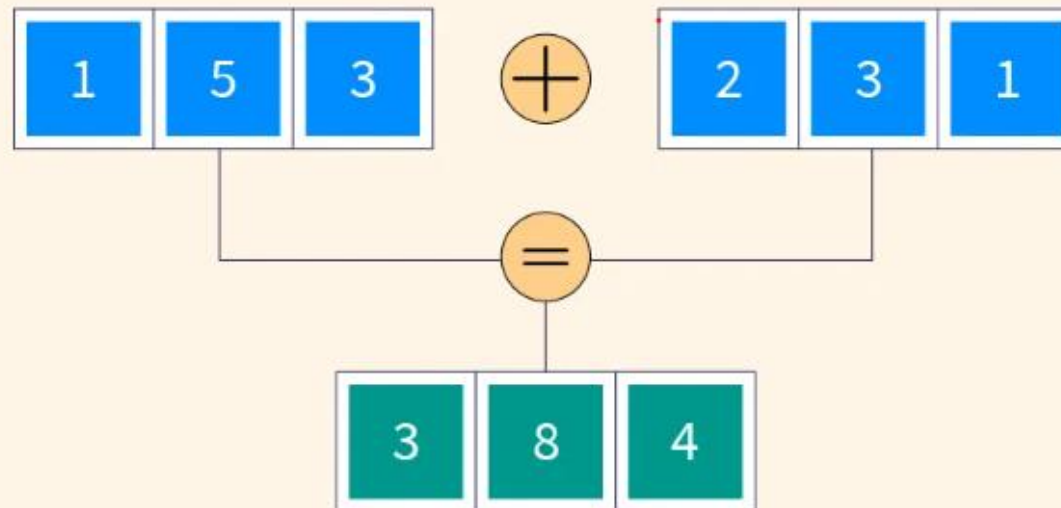
***NumPy***



# Numpy

- **Vectorization**

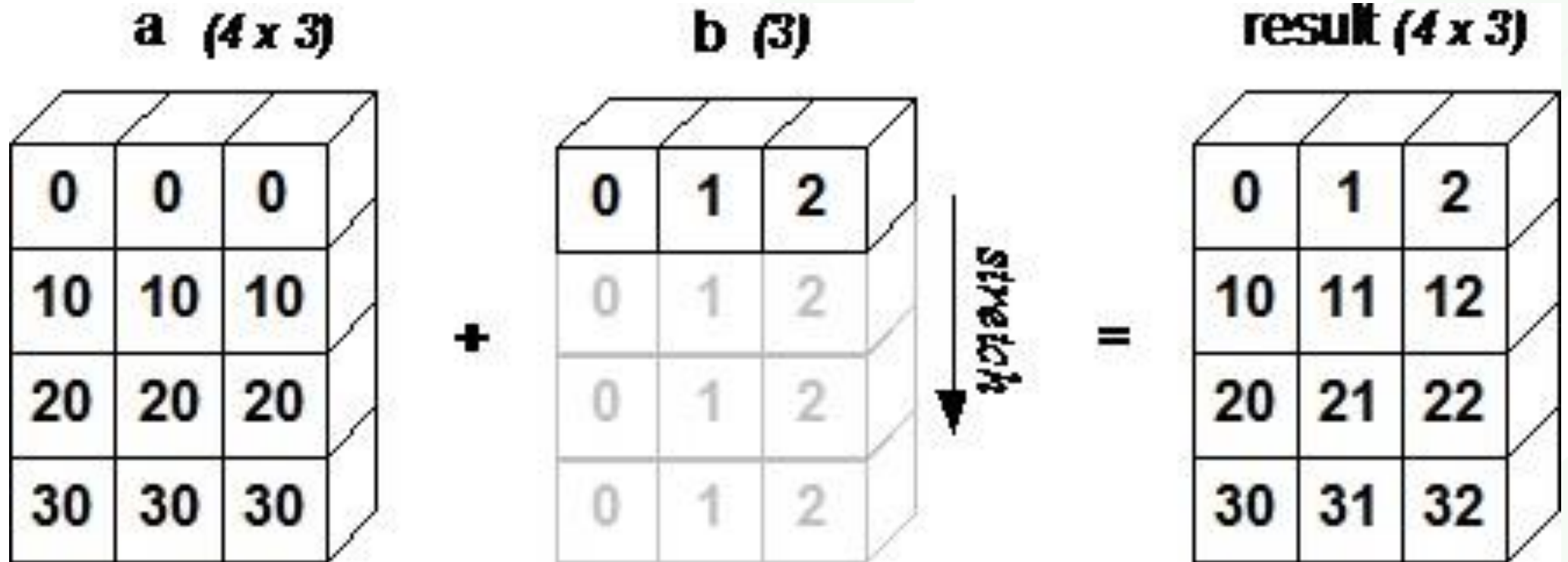
## Vectorization in NumPy



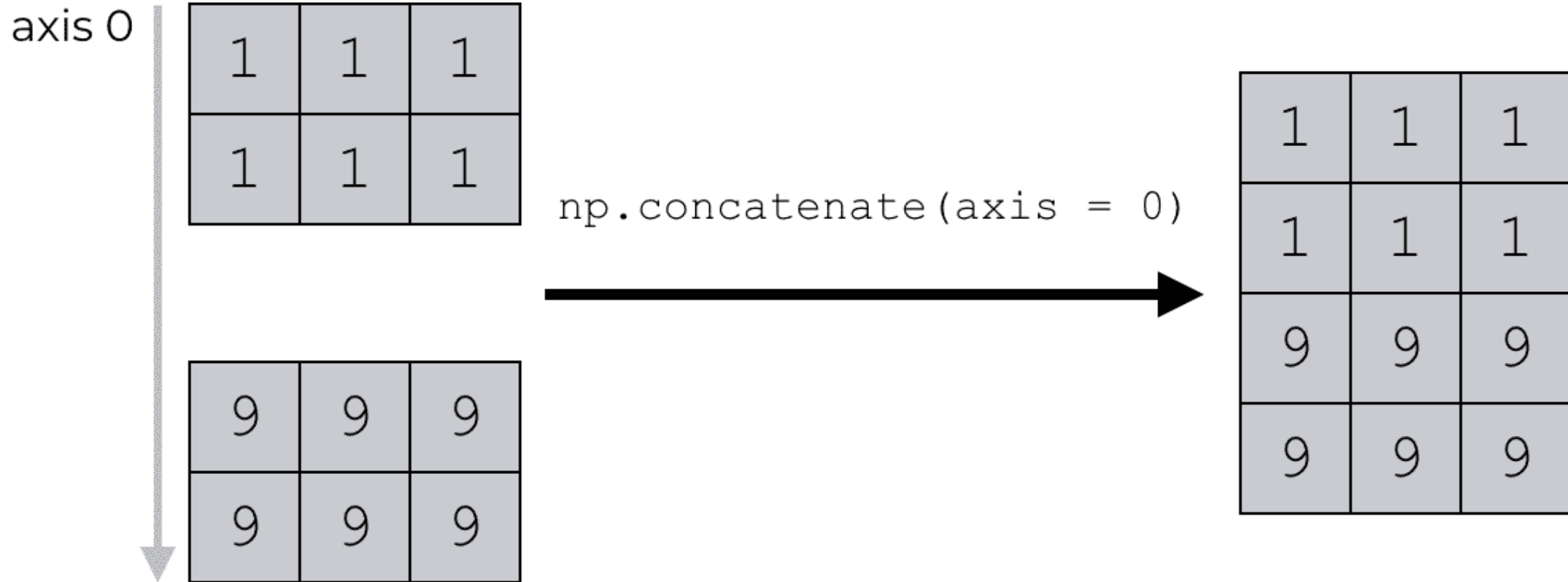


# Numpy

## ▪ Broadcasting

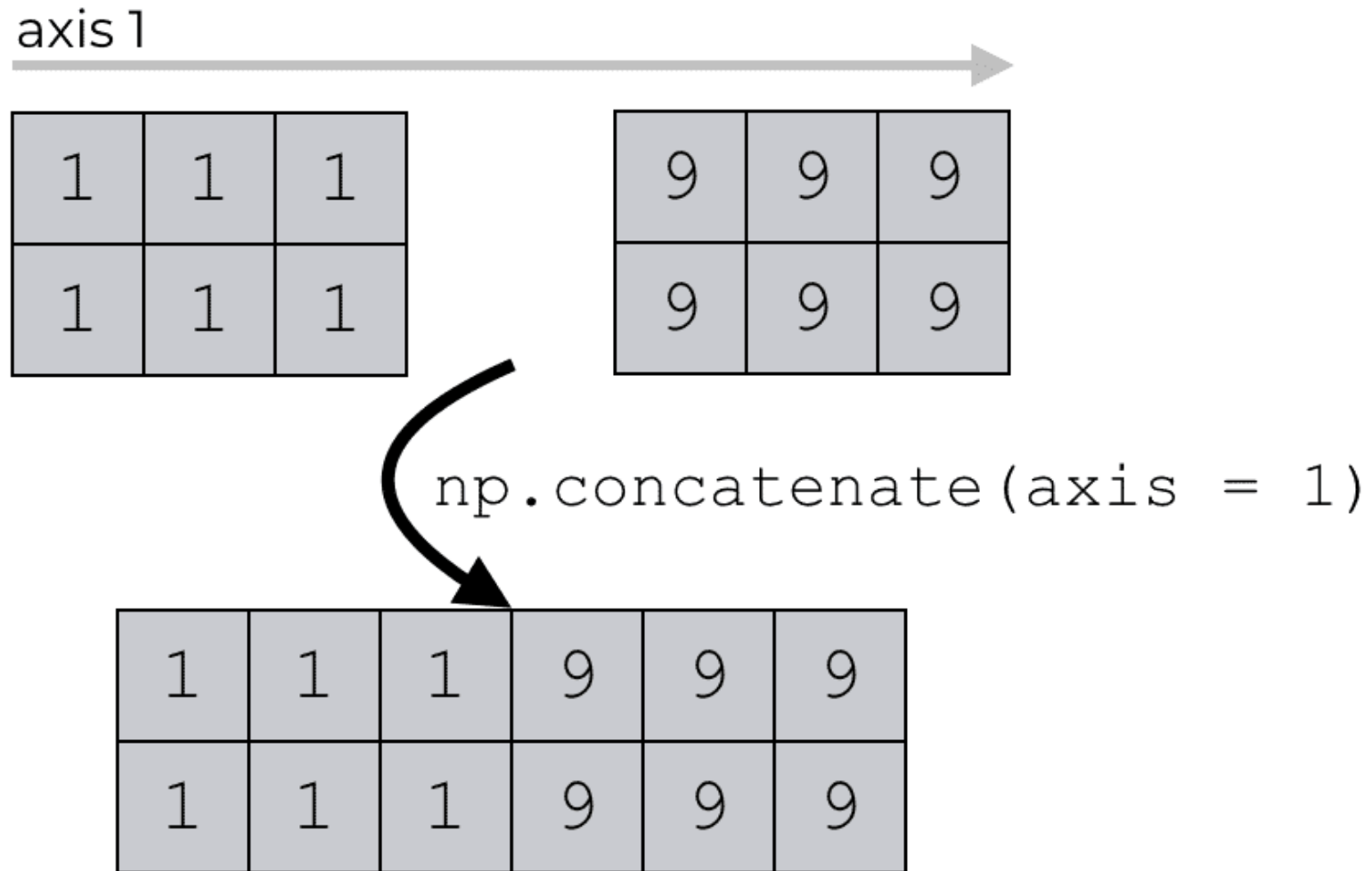


# Setting `axis=0` concatenates along the row axis





# Setting `axis=1` concatenates along the column axis



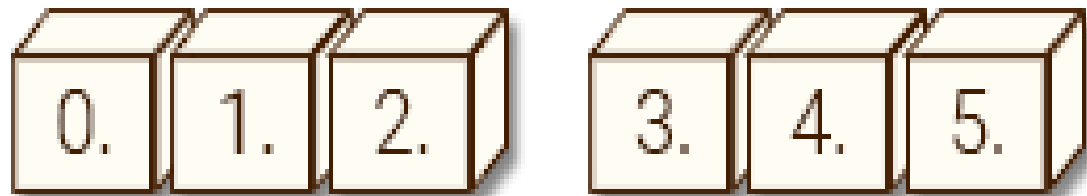




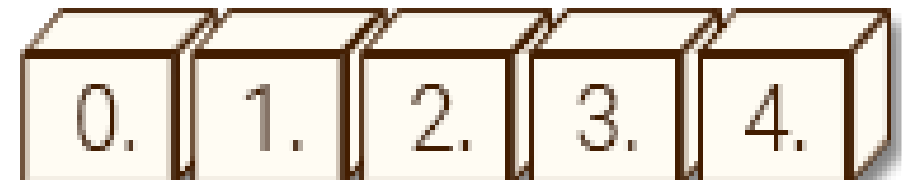
# Numpy



↓  
`np.split(2)`



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↓  
`np.array_split(3)`



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# Numpy

Original array



`np.split(x, [2, 6])`



After splitting





# Numpy

5	3	1	2	4
---	---	---	---	---



`np.sort()` SORTS THE  
VALUES OF A NUMPY ARRAY

1	2	3	4	5
---	---	---	---	---



# Numpy

				<u>Sort</u>			
				Axis 0	1	0	1
				→	5	1	1
					8	6	2
Axis 0 ↓	Axis 1 →						
	1	6	2				
	5	1	1				
	8	0	1	Axis 1	1	2	6
				→	1	1	5
					0	1	8



# Numpy

**TIME TO PRACTICE**