

#### I키포인트

- 스칼라, 벡터, 행렬.
- 벡터의 기본 연산.
- 행렬의 기본 연산.
- 벡터의 내적과 행렬의 곱.

# Ⅰ스칼라, 벡터, 행렬

• 스칼라:

3

3.141

**-** 9

• 벡터:

(1, 2, 3)

(-5.2, 6.9, 0, 0.002)

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# Ⅰ스칼라, 벡터, 행렬

• 행렬:

$$\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

⇒ 전치 행렬:

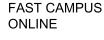
$$\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}^t = \begin{bmatrix} 1 & 2 & 3 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}^t = \begin{bmatrix} 1 & 4 \\ 2 & 5 \\ 3 & 6 \end{bmatrix}$$

#### I 벡터의 더하기와 빼기

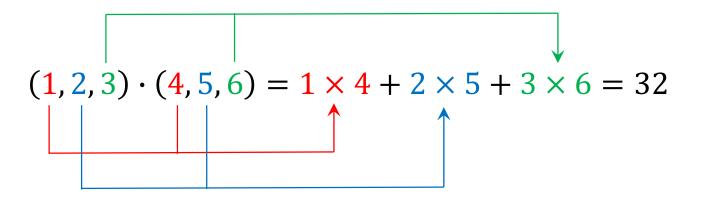
$$(1,2,3) + (4,5,6) = (1+4,2+5,3+6) = (5,7,9)$$

$$(4,5,6) - (1,2,3) = (4-1,5-2,6-3) = (3,3,3)$$





## l 벡터의 내적



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## l 벡터와 스칼라의 곱, 나누기

$$3 \times (1,2,3) = (3 \times 1, 3 \times 2, 3 \times 3) = (3,6,9)$$

$$(3,6,9)/3 = (3/3,6/3,9/3) = (1,2,3)$$

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#### Ⅰ 행렬의 더하기와 빼기

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} + \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix} = \begin{bmatrix} 1+5 & 2+6 \\ 3+7 & 4+8 \end{bmatrix} = \begin{bmatrix} 6 & 8 \\ 10 & 12 \end{bmatrix}$$

$$\begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix} - \begin{bmatrix} 1 & 2 \\ 3 & 8 \end{bmatrix} = \begin{bmatrix} 5 - 1 & 6 - 2 \\ 7 - 3 & 8 - 4 \end{bmatrix} = \begin{bmatrix} 4 & 4 \\ 4 & 4 \end{bmatrix}$$



#### Ⅰ행렬의 곱

$$\begin{bmatrix} 1 & 2 & 3 \end{bmatrix} \cdot \begin{bmatrix} 4 \\ 5 \\ 6 \end{bmatrix} = 1 \times 4 + 2 \times 5 + 3 \times 6 = 32$$

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#### Ⅰ행렬의 곱

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} \cdot \begin{bmatrix} 7 & 10 \\ 8 & 11 \\ 9 & 12 \end{bmatrix} = \begin{bmatrix} 1 \times 7 + 2 \times 8 + 3 \times 9 & 1 \times 10 + 2 \times 11 + 3 \times 12 \\ 4 \times 7 + 5 \times 8 + 6 \times 9 & 4 \times 10 + 5 \times 11 + 6 \times 12 \end{bmatrix}$$

$$= \begin{bmatrix} 50 & 68 \\ 122 & 167 \end{bmatrix}$$

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#### Ⅰ행렬의 곱

$$\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix} \cdot \begin{bmatrix} 4 & 5 & 6 \end{bmatrix} = \begin{bmatrix} 1 \times 4 & 1 \times 5 & 1 \times 6 \\ 2 \times 4 & 2 \times 5 & 2 \times 6 \\ 3 \times 4 & 3 \times 5 & 3 \times 6 \end{bmatrix} = \begin{bmatrix} 4 & 5 & 6 \\ 8 & 10 & 12 \\ 12 & 15 & 18 \end{bmatrix}$$

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## Ⅰ 행렬과 스칼라의 곱, 나누기

$$3 \times \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} = \begin{bmatrix} 3 \times 1 & 3 \times 2 & 3 \times 3 \\ 3 \times 4 & 3 \times 5 & 3 \times 6 \end{bmatrix} = \begin{bmatrix} 3 & 6 & 9 \\ 12 & 15 & 18 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} / 2 = \begin{bmatrix} 1/2 & 2/2 & 3/2 \\ 4/2 & 5/2 & 6/2 \end{bmatrix} = \begin{bmatrix} 0.5 & 1.0 & 1.5 \\ 2.0 & 2.5 & 3.0 \end{bmatrix}$$

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Ι끝.

# 감사합니다.



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