NLP Basic

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행렬 연산

Element wise sum

$$\begin{pmatrix} a_{11} & \cdots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{m1} & \cdots & a_{mn} \end{pmatrix} + \begin{pmatrix} b_{11} & \cdots & b_{1n} \\ \vdots & \ddots & \vdots \\ b_{m1} & \cdots & b_{mn} \end{pmatrix} = \begin{pmatrix} a_{11}+b_{11} & \cdots & a_{1n}+b_{1n} \\ \vdots & \ddots & \vdots \\ a_{m1}+b_{m1} & \cdots & a_{mn}+b_{mn} \end{pmatrix}$$

(m,n) (m,n) (m,n)

$(m,1)$

$(1,n)$

$(1,1)$

행렬 연산

Element wise multiplication

$$\begin{pmatrix} a_{11} & \cdots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{m1} & \cdots & a_{mn} \end{pmatrix} \odot \begin{pmatrix} b_{11} & \cdots & b_{1n} \\ \vdots & \ddots & \vdots \\ b_{m1} & \cdots & b_{mn} \end{pmatrix} = \begin{pmatrix} a_{11}b_{11} & \cdots & a_{1n}b_{1n} \\ \vdots & \ddots & \vdots \\ a_{m1}b_{m1} & \cdots & a_{mn}b_{mn} \end{pmatrix}$$

(m,n) (m,n) (m,n)

$(m,1)$

$(1,n)$

$(1,1)$

행렬 연산

Matrix multiplication

$$\begin{pmatrix} a_{11} & \cdots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{m1} & \cdots & a_{mn} \end{pmatrix} \times \begin{pmatrix} b_{11} & \cdots & b_{1l} \\ \vdots & \ddots & \vdots \\ b_{n1} & \cdots & b_{nl} \end{pmatrix} =$$

(m, n) (n, l)

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행렬 연산

Matrix multiplication

$$\begin{matrix} a_1 \\ a_m \end{matrix}\begin{pmatrix} a_{11} & \cdots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{m1} & \cdots & a_{mn} \end{pmatrix} \times \begin{matrix} b_1 & & b_l \end{matrix}\begin{pmatrix} b_{11} & \cdots & b_{1l} \\ \vdots & \ddots & \vdots \\ b_{n1} & \cdots & b_{nl} \end{pmatrix} = \begin{pmatrix} a_1 \cdot b_1 & \cdots & a_1 \cdot b_l \\ \vdots & \ddots & \vdots \\ a_m \cdot b_1 & \cdots & a_m \cdot b_l \end{pmatrix}$$

(m, n) (n, l) (m, l)

행렬 연산

Dot-product

$$\underset{(1,n)}{\begin{pmatrix} a_1 & \cdots & a_n \end{pmatrix}} \cdot \underset{(n,1)}{\begin{pmatrix} b_1 \\ \vdots \\ b_n \end{pmatrix}} = \underset{(1,)}{a_1 b_1 + \cdots + a_n b_n}$$

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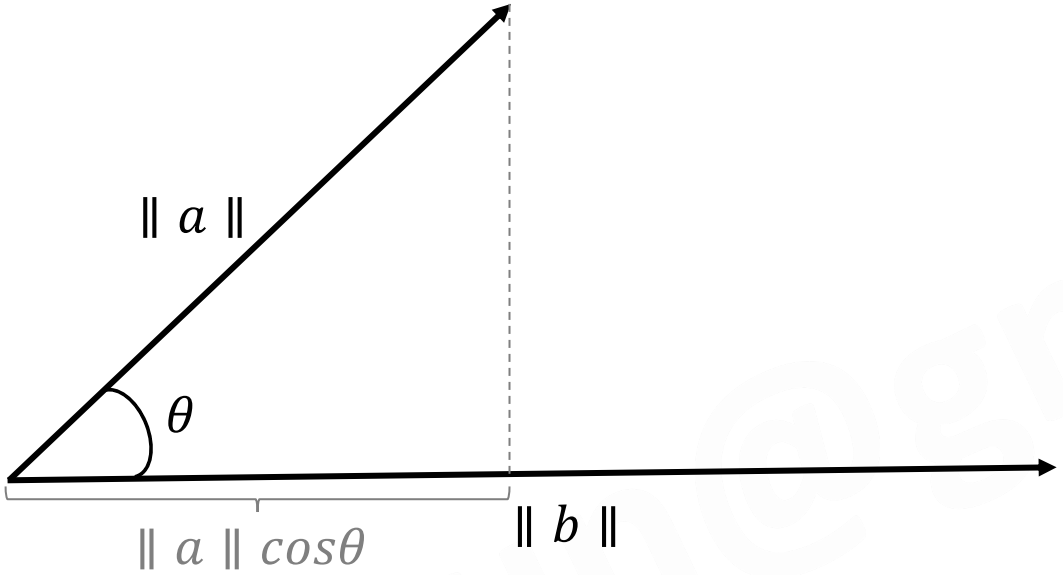
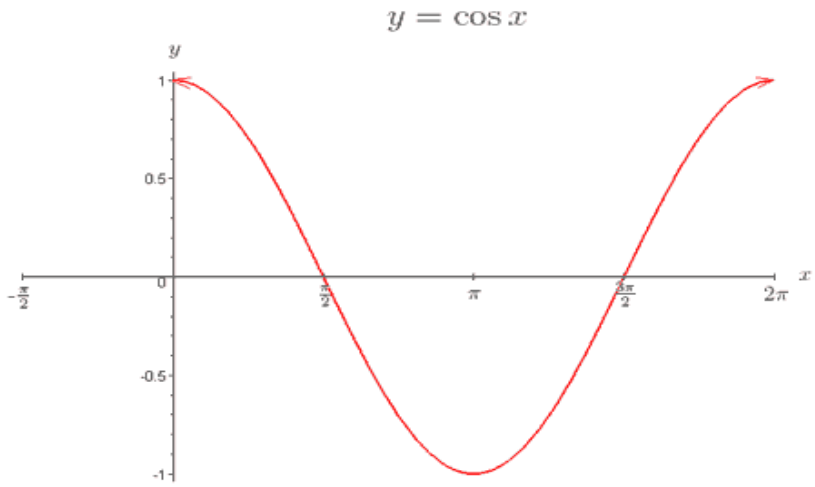
행렬 연산

Dot-product





$$a \cdot b = \| a \| \| b \| \cos\theta$$

Thanks