

I want pizza

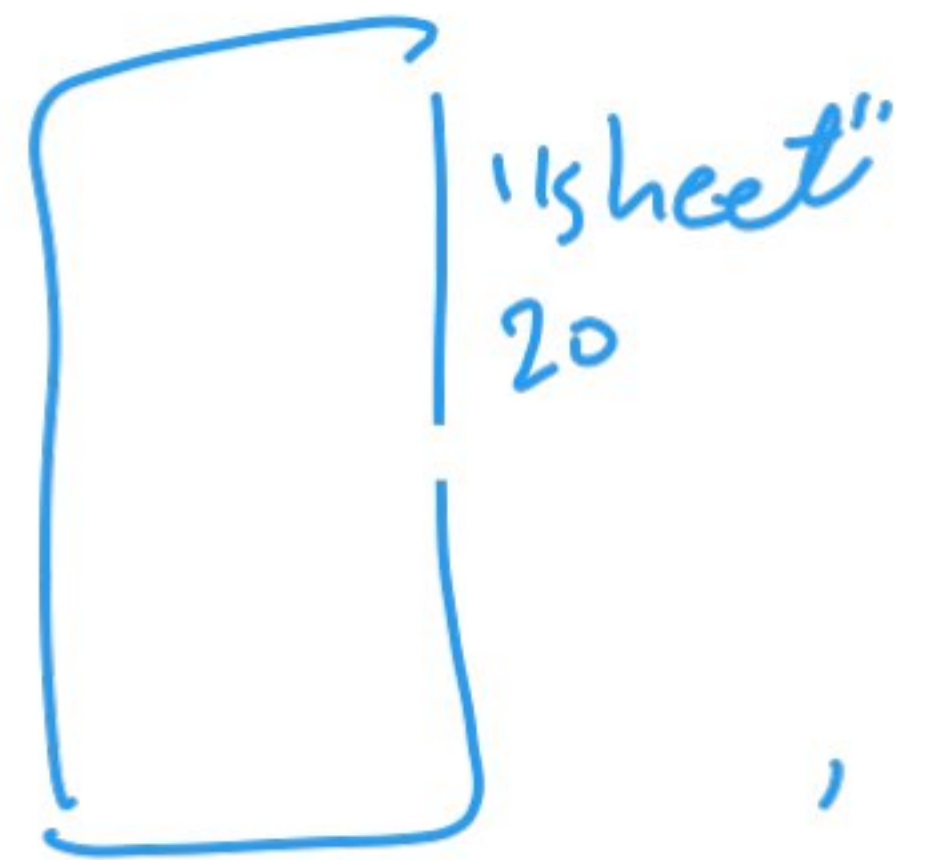
mask

7-up

50%  
1/2

$$tf-IDf = tf * IDF$$

$$= \frac{20}{250} * \log\left(\frac{10000}{2500}\right)$$



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$$\text{Cos-Sim} = \frac{w_1^T \cdot w_2}{|w_1| |w_2|} = 0.9$$

-1 → 1

$$= -0.09$$

D<sub>1</sub>: natural language Process become important begin  
talk Computer

D<sub>2</sub>: Computer understand natural language become simple  
use

D<sub>3</sub>: Speech Recognition first Step !!!!! Computer like



	$D_1$	$D_2$	$D_3$	$tf$	$IDF$	$tf-IDF$
natural			0	0	$3/2$	0
language			0	0		0
process			0	0		0
become			0	0		0
important			0	0		0
begin			0	0		0
talk			0	0		0
computer			0	0		0
understand			1	$1/7$	$\log_2(3/3)$	0
simple			0	0		0
use			0	0		0
speech			0	0		0
recognition			0	0		0
first			1	$1/7$	$\log(3/1)$	
step			1	$1/7$	$3/1$	
build			1	$1/7$	$3/1$	
like			1	$1/7$	$3/1$	
			1	$1/7$	$3/1$	



$$V \begin{bmatrix} 1 \\ 0 \\ \vdots \end{bmatrix}$$

a)  $d = 300$

b)  $V \times d$

c)  $d \times V$

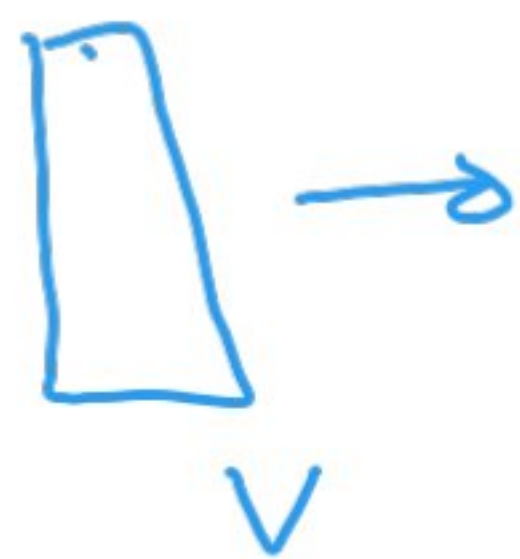
d)  $V$

30 K

$$\begin{bmatrix} \vdots \end{bmatrix}_{V \times d}$$

$$\begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}_{1 \times d}$$

$$\begin{bmatrix} \vdots \end{bmatrix}_{d \times V}$$



$$\begin{array}{c}
 1 \times V \quad V \times d \\
 [a_1, a_2, a_3]^{1 \times V} \quad d \\
 V \begin{bmatrix} b_1 \\ b_2 \\ b_3 \end{bmatrix}
 \end{array}$$

$V$  multiplication  
 $(V-1)$  additions  
 $a_1 b_1 + a_2 b_2 + a_3 b_3$

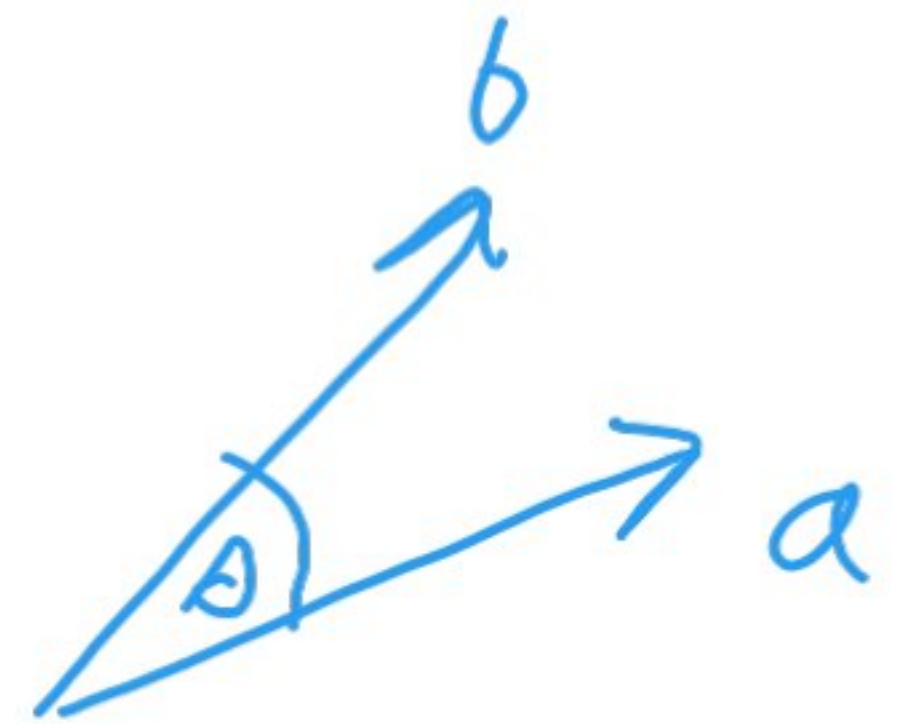
$$|V|^* d + c d^* |V| = O(d^* |V|)$$



word  $\rightarrow$  center vector  $V \rightarrow$  doesn't change with context  
 $\rightarrow$  context vector  $u \rightarrow$  changes with context

$$w \quad w' \quad | \quad a \cdot b = |a| |b| \cos(\theta)$$

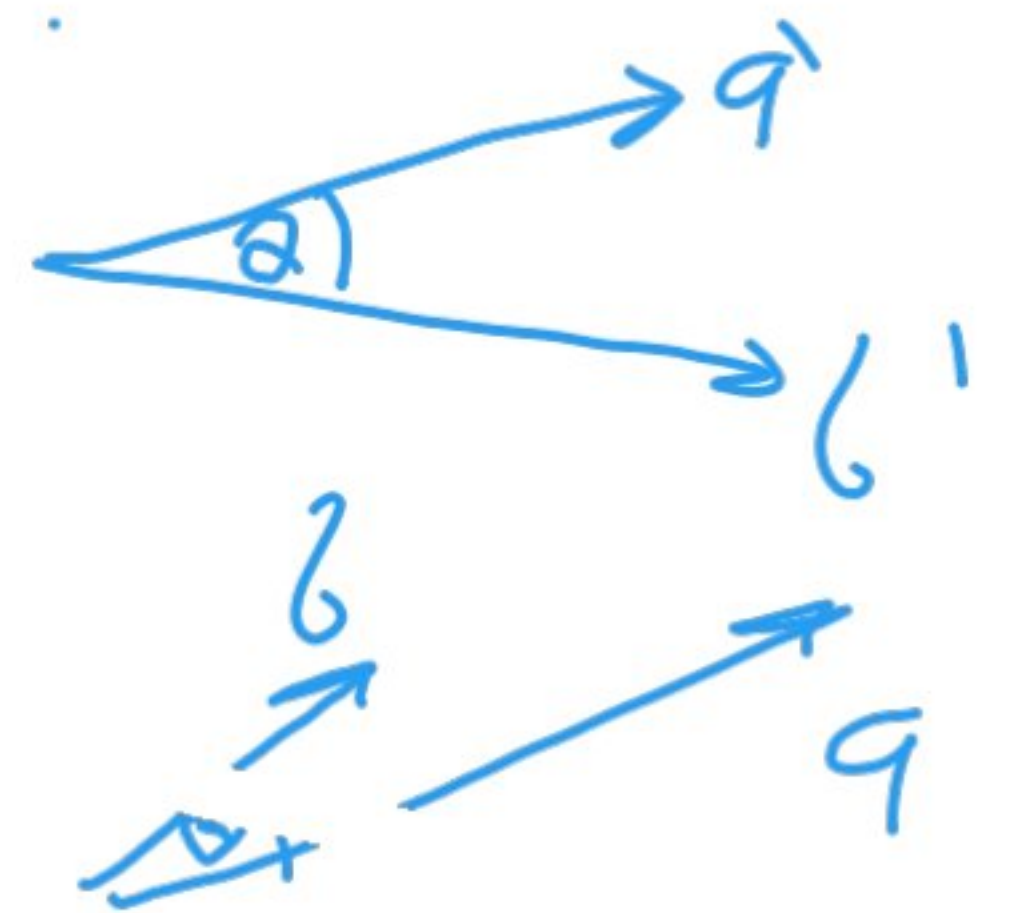
$$w \quad w' \quad | \quad \begin{matrix} a \neq a' \\ b \neq b' \end{matrix}$$

$$u_w^{AT} \cdot V_{w'}^A = u_w^{BT} \cdot V_{w'}^B$$

$$\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} 0 \\ 1 \end{bmatrix}$$

$$\begin{matrix} a = a' \\ b \neq b' \end{matrix}$$



$$\begin{array}{ccc}
 & w & \\
 \textcircled{A} & U & \longrightarrow A \quad V \\
 \textcircled{B} & U & \longrightarrow B \quad V
 \end{array}$$

Diagram illustrating a mapping from a set  $w$  to a set  $w'$ . The elements of  $w$  are  $A$  and  $B$ , both of which are mapped to the set  $U$ . The elements of  $w'$  are  $A$  and  $B$ , both of which are mapped to the set  $V$ .