

## # Agendas

- ① What is feature extraction from text/Image
- ② Why we need it?
- ③ Why it is so Difficult
- ④ What is the core idea
- ⑤ Some Techniques.

## # Machine Learning

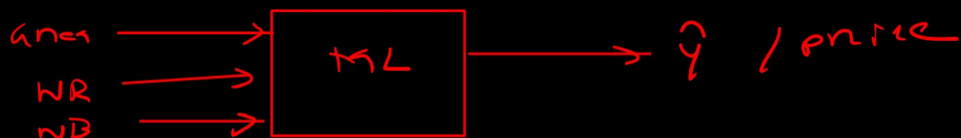
\* Tabular Data

\* CSV, JSON, XLSX

(4x5)

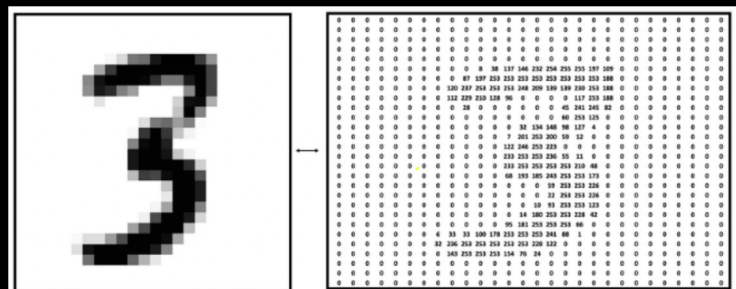
	col1	col2	col3	col4
1	P <sub>1</sub>			
2	P <sub>2</sub>			
3	P <sub>3</sub>			
4	P <sub>4</sub>			
5	P <sub>5</sub>			

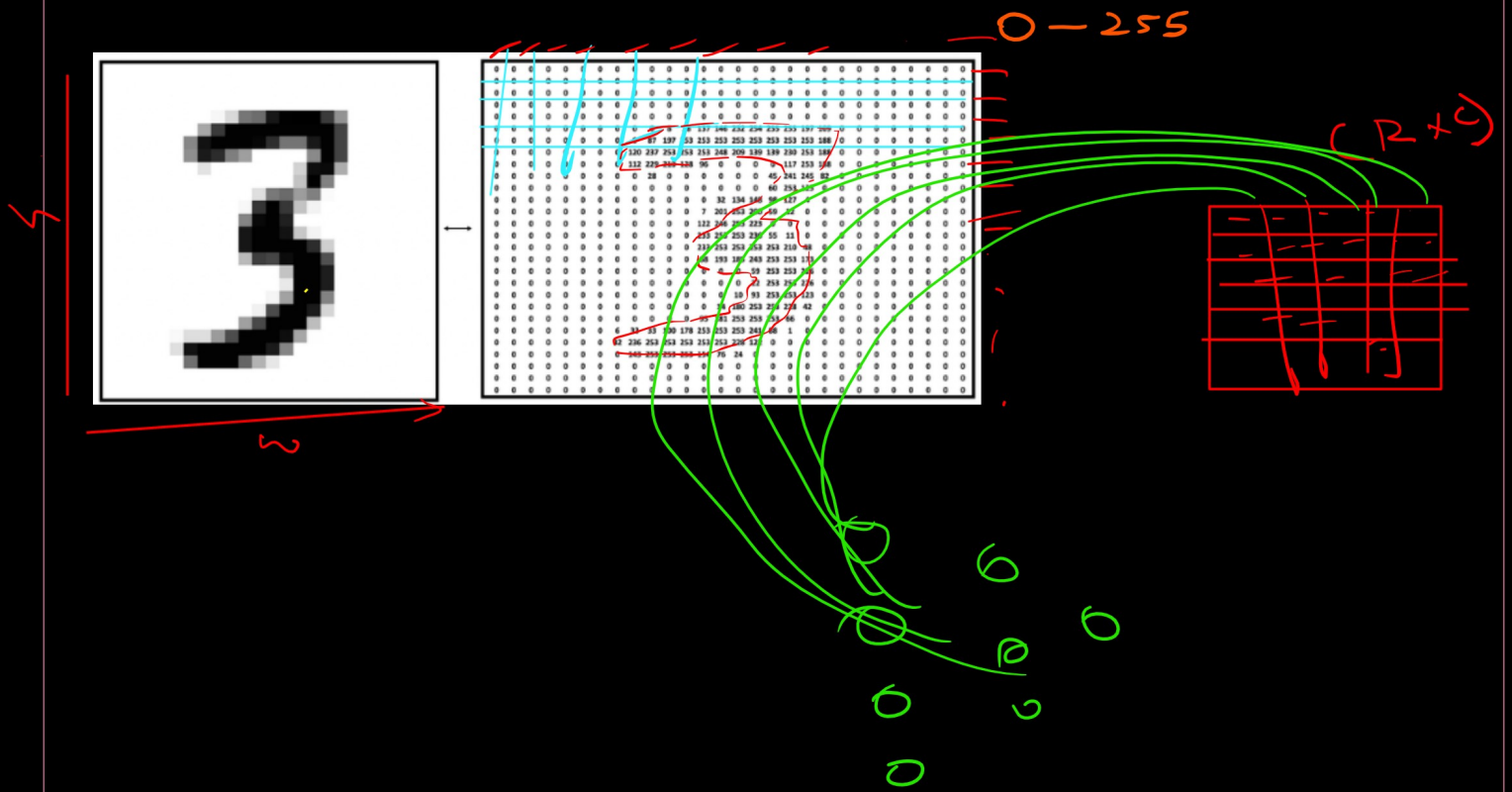
Area NR NO Price



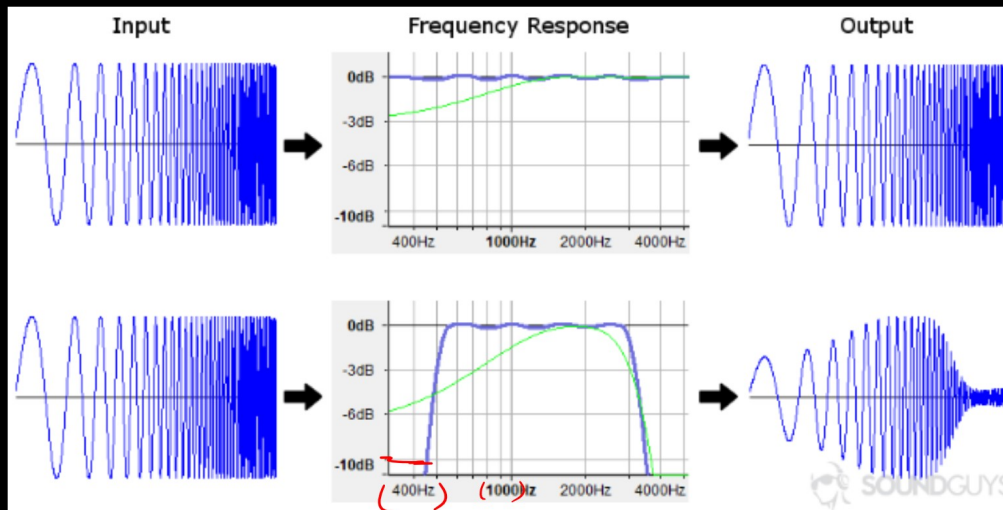
## # Computer vision

Image/video





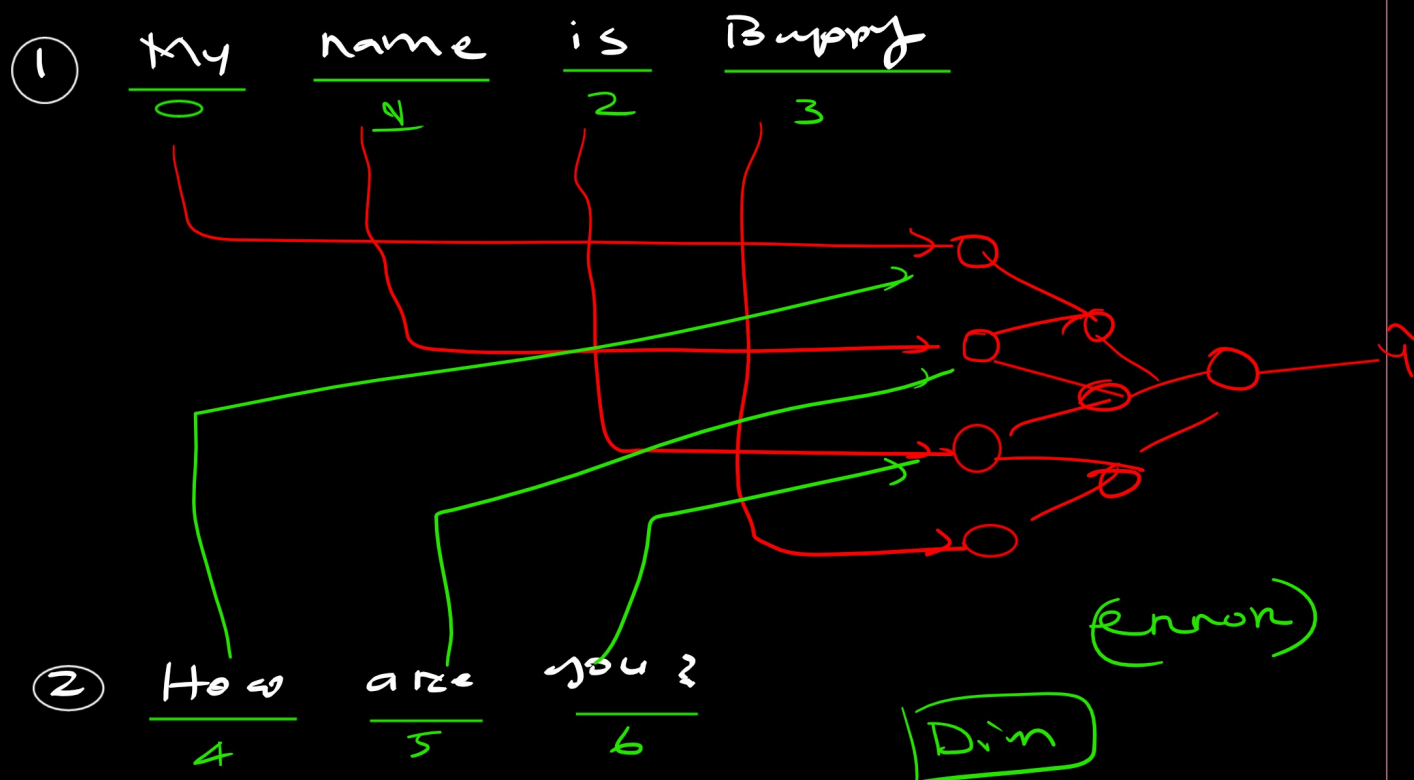
# Audio Pubn:



(C, R)

Frequency	dB
400 Hz	-10dB
—	—
—	—
—	—
—	—

## # Text Data:



✓ ① One hot Encoding →

✓ ② Bag of word (BOW) →

✓ ③ Ngrams

✓ ④ TFIDF →

✓ ⑤ word2vec → (DL) NN

# One Hot Encoding

✓ D <sub>1</sub>	people watch dswitlborg
✓ D <sub>2</sub>	dswitlborg watch dswitlborg
D <sub>3</sub>	people write comments
D <sub>4</sub>	dswitlborg write comments

# corpus:

people watch dswitlborg  
 dswitlborg watch dswitlborg  
 people write comments  
 dswitlborg write comments

N=5, N=1000

my name is Brown

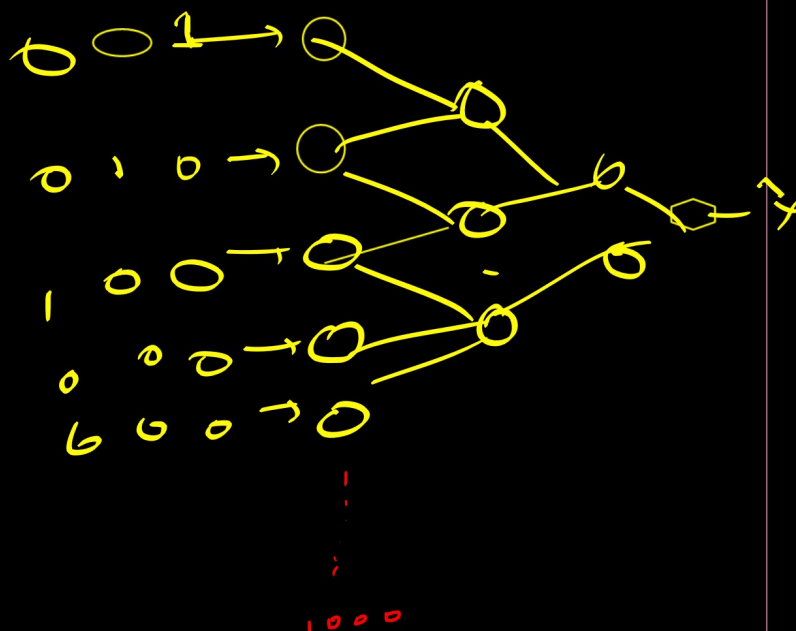
D<sub>1</sub> =  $\begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \end{bmatrix}$

people	watch	write	comment
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1	0	0	0	0
0	1	0	0	0
0	0	1	0	0
0	0	1	0	0
0	1	0	0	0
0	0	1	0	0

D<sub>2</sub> =  $\begin{bmatrix} 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \end{bmatrix}$

0+0=0  
 0-0=0  
 0<0=0  
 0/0=0



## # Draw Backs

- ① Sparsity — 0
- ② OOV — out of vocab
- ③ No fixed size
- ④ Not capturing semantic meaning
- ⑤ Dim Increase

## Bag of word

0.13    0.15    0.17    0.88

		people	watch	write	comment
✓ D <sub>1</sub>	people watch dsutuborg				
✓ D <sub>2</sub>	dsutuborg watch dsutuborg	1	1	1	0
✓ D <sub>3</sub>	people write comments	0	1	2	0
✓ D <sub>4</sub>	dsutuborg write comments	1	0	0	1
		0	0	1	1

## Research → sentiment analysis

→ This movie is amazing, Amazing performance

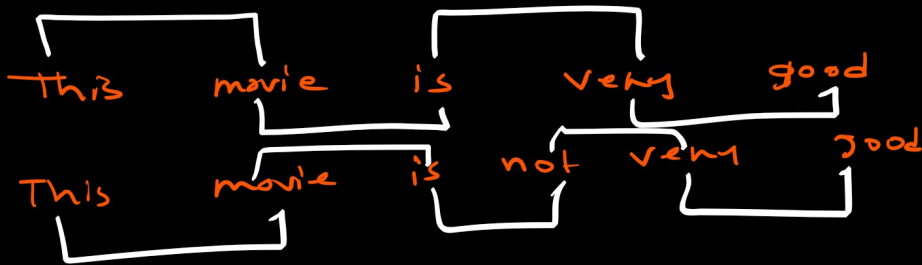
← +ve

positive sentiment

$N = 2$

negation

Bigram



→ +ve  
→ -ve

✓  
TFIDF

DL  $\rightarrow$  word 2 vec

Features	king	queen	man	woman	monkey
gender	1	0	1	0	1
wealth	1	1	0.3	0.2	0
power	1	0.7	0.3	0.2	0
weight	0.8	0.5	0.7	0.5	0.3
speech	1	1	1	1	0

(cost)

king = [1, 1, 1, 0.8, 1]

queen = [0, 1, 0.7, 0.5, 1]

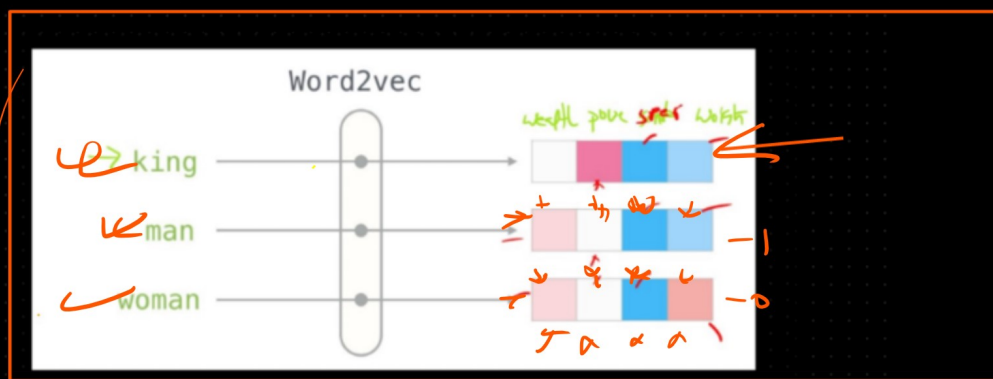
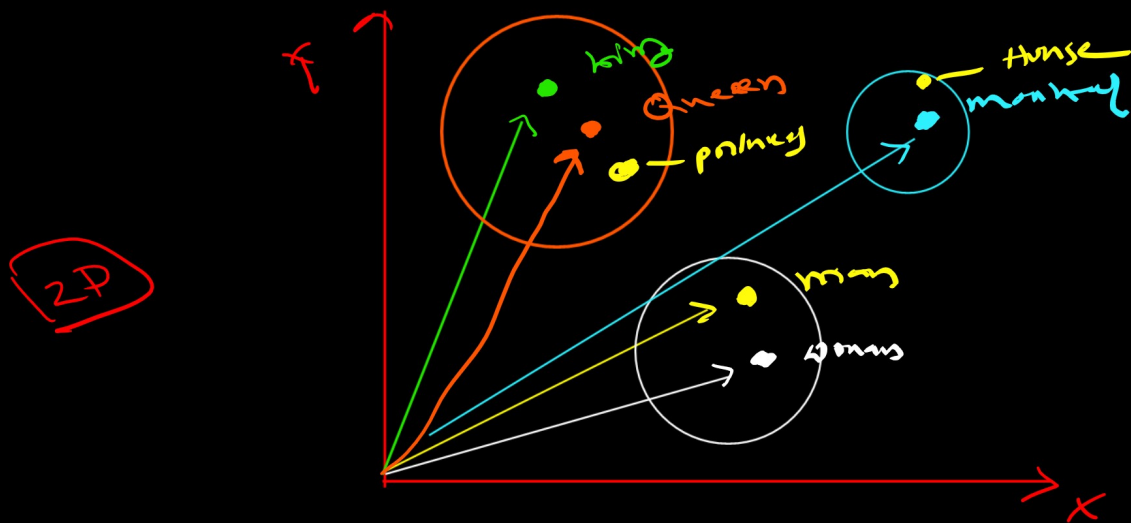
man = [1, 0.3, 0.3, 0.7, 1]

woman = [0, 0.2, 0.2, 0.5, 1]

monkey = [1, 0, 0, 0.3, 0]

princes





# Transformers modules

Embedding module / prediction

(Vectors) → (FC layer)