⇒ **Encoder**

Hey, How are you?

⇒ Computer don't understands words | text.

⇒ Computer only understands numbers

$$[\text{"}\underline{\quad}\text{"}, \text{"}\underline{\quad}\text{"}, \text{"}\underline{\quad}\text{"}, \text{----}]$$

⇒ [apple   orange   cat   dog   tiger]
      1   1/0   1/0 - - - -

⇒ One Hot Encoding   Embedding
          =   ↓
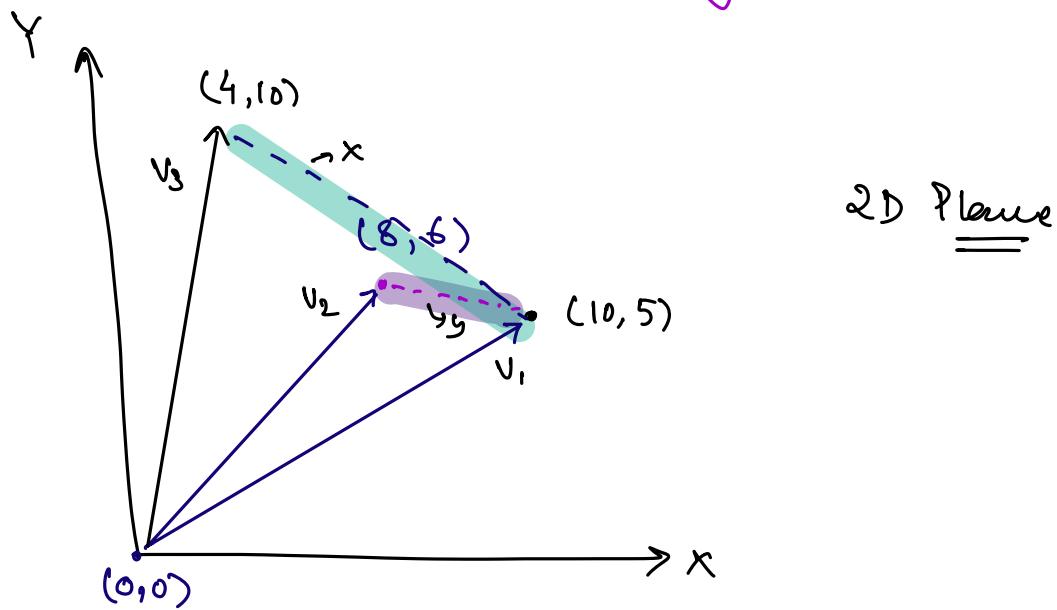
apple : [1 0 0 0 0]
orange : [0 1 0 0 0]
cat   : [0 0 1 0 0]

apple < fruit
        < Company

apple   apple   apple   apple

⇒ Word Embedding

→ Vector Embedding

2D Plane

Y

(4,10)

v_3

x

(8,5)

v_2

v_3

(10,5)

v_1

(0,0)

X

apple: [_ _ _ _ _ _ _ _ _ _ _ _]

↳ 1536

Word Embedding

→ Represents each word as a vector (list of numbers) to capture the meaning of word.

apple : [0.6   0   0.25   0.49 . . . .]

$$\underbrace{\hspace{4cm}}_{n\ dimensions.}$$

Orange : [0.65   0   0.21 - - - - - - - -]

Car : [0.0001 0.7   0.79 - - - - - - - -]

If 2 word are of similar meaning

⇒ These words will have similar vectors.
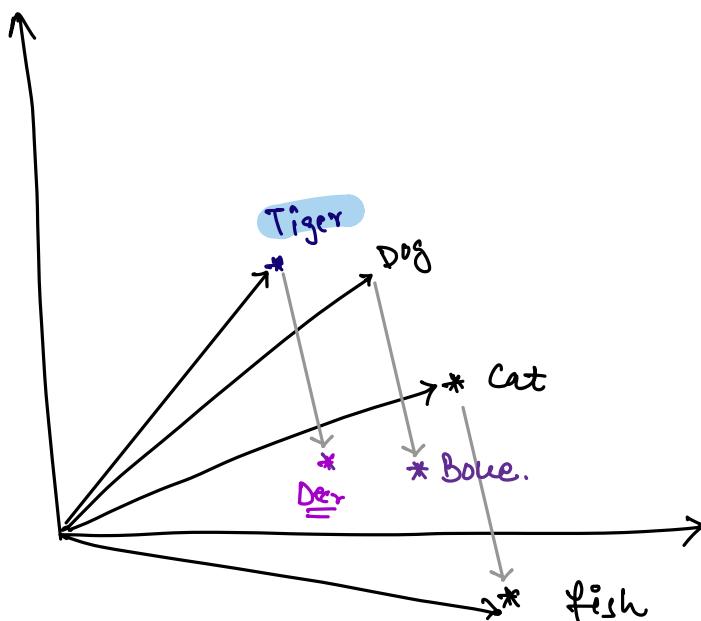
$$\underbrace{\hspace{3cm}}_{Close\ vectors}$$

Different words ⇒ far apart vectors.

⇒ Static vector embedding.

Cat : [——————————]

↪ fish : [——————————]

Dog : [——————————]

↪ Boue.

Tiger   Dog   Cat   * Boue.   Deer   * fish

\# I went to bank to withdraw money.

I sat on river bank

\# Self - Attention.

↪ decides the importance / meaning of each word based on the sentence.

bank $\Rightarrow$ money | transaction | transfer ....

    $\rightarrow$ financial Institute

bank $\Rightarrow$ river, water, ...

    $\rightarrow$ River bank.

Sentence (Input)

$\downarrow$

Tokenization

$\downarrow$

Vector Embedding + Self attention

$\downarrow$

Context - Awareness.

Q: Who was captain of ICT in 2011 WC?

    $\rightarrow$ MS Dhoni

Q: Tell me more about him.

Word → Embedding

↳ Closer Vectors ⇒ Similar meaning
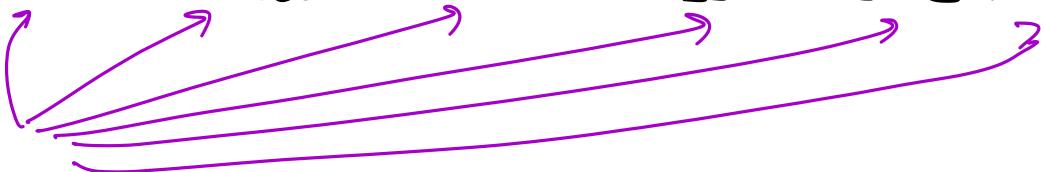
far Vector ⇒ Less Similar meaning

+

Context Awareness (Self Attention)

Multi Head Attention

↳ Apply multiple self attentions parallely.

⇒ The animal didn't cross the street because

it was tried.

↳ .

⇒ High Compute cost.