Emebedding Space

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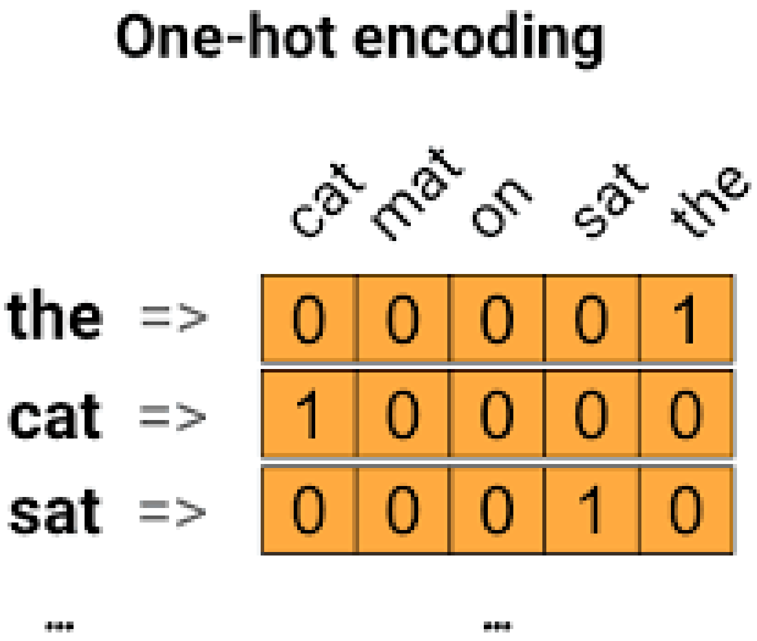
- What is embedding Space?

One hot embedding or encoding?

- One hot encoding does not tell anything about the semantics of the items but embedding will group co-occurring items together in the representation space. So, word embedding is a better solution than one-hot encoding as it gives better results.

example



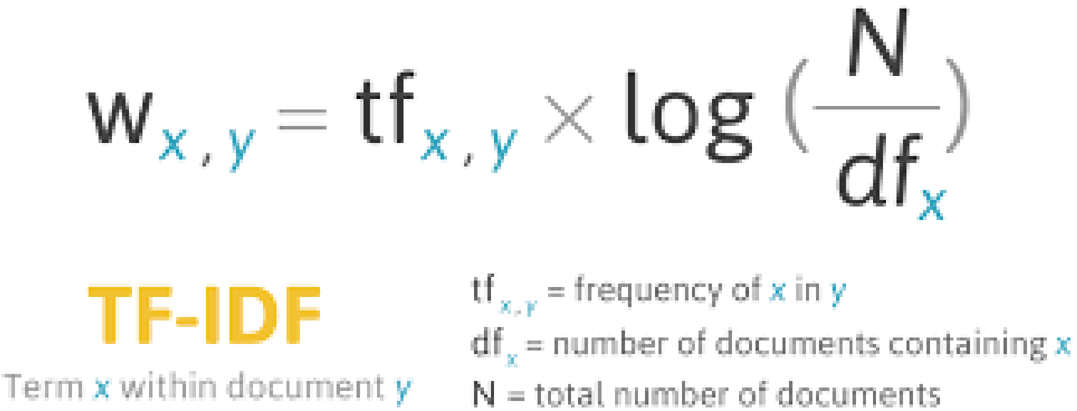
One-hot encoding

	cat	mat	on	sat	the
the =>	0	0	0	0	1
cat =>	1	0	0	0	0
sat =>	0	0	0	1	0
...			...		

- One hot pros and cons??

TF-IDF

- TF (Term Frequency)
- IDF (Inverse Documet Frequency)



$$w_{x,y} = tf_{x,y} \times \log\left(\frac{N}{df_x}\right)$$

TF-IDF

Term x within document y

$tf_{x,y}$ = frequency of x in y

df_x = number of documents containing x

N = total number of documents

example

[He is Walter],

[He is William],

[He isn’t Peter or September]

example

[0.33, 0.33, 0.33],

[0.33, 0.33, 0.33],

[0.20, 0.20, 0.20, 0.20, 0.20]

example

“He”: Log(3/3)= 0,

“is”: Log(3/2):0.1761,

“or, Peter, ..”: log(3/1) : 0.4771

example

[1. , 1.1761 , 1.4771 , 0. , 0. , 0. , 0. , 0.],

[1. , 1.1761 , 0. , 1.4771 , 0. , 0. , 0. , 0.],

[1. , 0. , 0. , 0. , 1.4771 , 1.4771, 1.4771 , 1.4771],

- TF-IDF pros and cons??

Word2Vec?

- Word2vec is a technique for natural language processing (NLP) published in 2013. The word2vec algorithm uses a neural network model to learn word associations from a large corpus of text.

- Word2Vec pros and cons??

Contextualized embedding?

- Contextual embeddings assign each word a representation based on its context, thereby capturing uses of words across varied contexts and encoding knowledge that transfers across languages.

- Contextualized embedding pros and cons??