**CASE STUDY: Word Embedding Techniques**

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5. **What is Word Embedding?**

* Word Embedding can be defined as a way to categorize similar words in the form of a numerical vector, so that the computer can easily process it.
* In technical terms, we can say that word embedding is a numeric representation of words in a lower-dimensional space, capturing semantic and syntactic information.
* They play a vital role in natural language processing (nlp) , and are used as an input to the machine learning models.
* There are multiple ways to do word embedding but, 2 of the important ones are as follows:

1. **Word2Vec Model**

* It is a word embedding model , which aims to capture the semantic relationships between words by mapping them to high-dimensional vectors.
* It achieves this by analysing the words nearby to the target word.
* It works on the idea that similar words should have a similar vector representation.
* In simple terms, we can say that it works on the principle that “words that appear in similar contexts have similar meanings”.
* This model has 2 approaches:

1. **Continuous Bag of Words (CBOW):**

* With this approach the main objective of the model is to predict the target word based on its context.
* It achieves this by analysing the surrounding words.

1. **Skip-Gram:**

* With this approach the main objective of the model is to predict the context (i.e, the surrounding words), based on the target word.

1. **GloVe Model**

* It is a word embedding model , which aims to capture the semantic relationships between words by using the concept of co-occurrence.
* In this , the model iterates through the entire dataset and then checks the co-occurrence of words , through which a co-occurrence matrix is created and a value is assigned as an element in the matrix based on the probability of co-occurrence of the 2 words.

1. **References**

* Chatgpt
* <https://www.geeksforgeeks.org/word-embeddings-in-nlp/>