

1. What are Vanilla autoencoders
2. What are Sparse autoencoders
3. What are Denoising autoencoders
4. What are Convolutional autoencoders
5. What are Stacked autoencoders
6. Explain how to generate sentences using LSTM autoencoders
7. Explain Extractive summarization
8. Explain Abstractive summarization
9. Explain Beam search
10. Explain Length normalization
11. Explain Coverage normalization
12. Explain ROUGE metric evaluation

Answers:

1. Vanilla autoencoders are a type of neural network used for unsupervised learning. They consist of an encoder and a decoder, where the encoder reduces the input data into a lower-dimensional representation, and the decoder attempts to reconstruct the original input from the reduced representation. The goal is to train the model to reconstruct the input as accurately as possible.
2. Sparse autoencoders are similar to vanilla autoencoders, but they are designed to learn sparse representations of the input data. This is done by adding a sparsity constraint to the loss function, which encourages the encoder to learn a smaller set of features that are most relevant to the input data.
3. Denoising autoencoders are designed to learn robust representations of the input data by training the model to reconstruct the original input from a noisy version of the input. This is done by corrupting the input with noise, and then training the model to reconstruct the original input.
4. Convolutional autoencoders are a type of autoencoder that uses convolutional layers in the encoder and decoder. They are commonly used for image data, where the convolutional layers can learn spatial features from the input.
5. Stacked autoencoders are composed of multiple layers of autoencoders, where the output of one layer is fed as input to the next layer. This allows the model to learn increasingly complex representations of the input data.
6. LSTM autoencoders can be used to generate sentences by training the model to encode a sentence into a fixed-length vector representation, and then decoding this representation to generate a new sentence. The decoder can be trained to predict the next word in the sentence based on the previous words generated, using a language model.
7. Extractive summarization is a type of summarization that selects and condenses the most important information from a text by identifying the most relevant sentences or phrases. It involves ranking the sentences or phrases based on their importance and selecting the top-ranked ones to form the summary.
8. Abstractive summarization is a type of summarization that generates a summary by paraphrasing and synthesizing the key information from a text. It involves understanding the meaning of the text and generating a summary that captures the

most important information, rather than simply selecting and condensing existing sentences.

9. Beam search is a technique used in sequence generation tasks, such as language generation or summarization, to generate the most likely sequence of output tokens given an input sequence and a model. It involves exploring the space of possible output sequences by considering multiple candidate sequences in parallel and selecting the most likely ones at each step.
10. Length normalization is a technique used to adjust the scores of candidate sequences generated by a language model based on their length. This is done to prevent longer sequences from having an unfair advantage over shorter ones, since longer sequences have more opportunities to generate higher scores.
11. Coverage normalization is a technique used in summarization to ensure that the summary includes all the important information from the source text. It involves keeping track of which parts of the source text have already been summarized, and penalizing the model for repeating or omitting information.
12. ROUGE (Recall-Oriented Understudy for Gisting Evaluation) is a set of metrics used to evaluate the quality of summarization models. It compares the output summary to one or more reference summaries based on overlap in n-grams (consecutive sequences of words) and other features, such as word order and sentence length.