edX

3. Simple Multinomial Generative model
Simple Multinomial Generative model

So this is our multinomial.

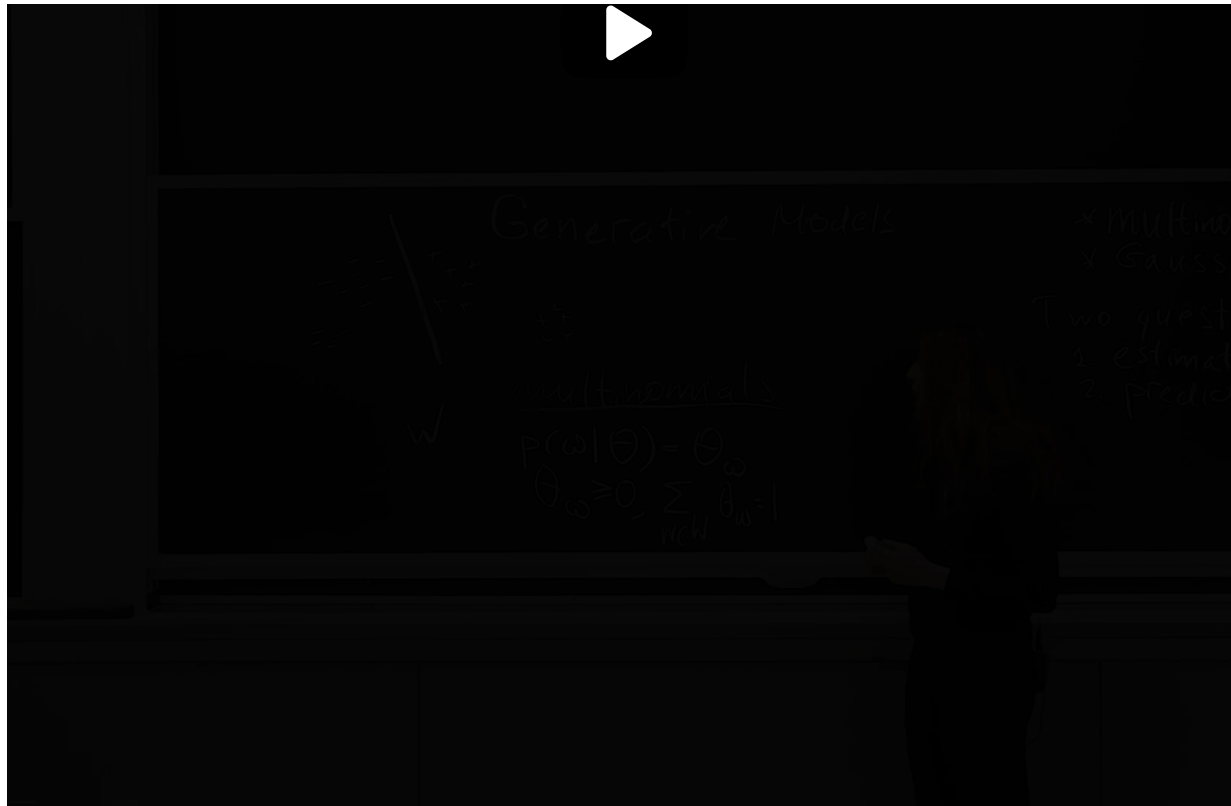And if you need another example and the text

sounds to you really weird, you can just see about dice.

So you're throwing dice, and your dice

doesn't have all the equal sides.

Some sides are more likely than others.

And that's exactly what I was theta W would record.

What is the likelihood of a particular word or number?

End of transcript. Skip to the start.

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Simple Multinomial Generative model

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Consider a very simple multinomial model M to generate text in documents.

Let us assume that this model M has a fixed vocabulary W and that we generate a document by sampling one word at a time from this vocabulary. Furthermore, all the words that are generated by M are independent of each other.

We would like to capture the fact in our generative model M that some words in W are more likely to occur in any given document than the others. So, the first thing that M models is how likely it is to generate certain word $w \in W$. We denote this probability by $P\left(w|\theta\right) = \theta_w$, where θ_w is a parameter in our model M.

Which of the following option(s) is/are true about the model parameters θ_w? Choose all that apply from the statements below:

- ☑ $\theta_w >= 0$ ✔

- ☐ $\theta_w >= 1$

- ☑ $\sum_{w \in W} \theta_w = 1$ ✔

- ☐ $\sum_{w \in W} \theta_w > 1$

✔

Solution:

Note that θ_w denotes the probability of model M choosing the word w. Since it's a probability, its value must lie between 0 and 1. Therefore, $0 \leq \theta_w \leq 1$.

Further, all the above probability values must also sum up to 1. That is, $\sum_{w \in W} \theta_w = 1$.

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