Deep
Natural Language Processing

Deep NLP
Presented by David Baker
February 2020

// FLATIRON SCHOOL

Outline

AI and Art

LSTM

What To Control

Make Something Creative!

What is going on here?

Is this art?

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Is this art? (5.7/10 IMDB)

What is the point of using artificial intelligence/machine learning/deep learning to create art?

Take ~5 minutes to discuss.

Is the "neural" part of a neural net doing what our brain does?

François Chollet ✔
@fchollet

Honestly, the question is not, and has never been, "can machine learning replace radiologists/etc" (which won't happen in the foreseeable future). The question is, how can radiology/etc utilize ML to improve outcomes, decrease the cost of care, and broaden accessibility.

10:49 PM · Jan 25, 2020 · Twitter for Android

361 Retweets   **1.6K** Likes

François Chollet ✔ @fchollet · Jan 25
Replying to @fchollet
ML represents a powerful set of machine perception affordances that until recently didn't exist. Utilize them. Much like computers in the 80s & 90s, it's not there to replace you, it's there to help you do your job better and at an increased scale.

8   48   301

Going Deeper... LSTM

- LSTM is a type of RNN
- First developed in 1997
- 2002ish ~ Douglas Eck began using on music
- Google Doodle Guy!

LSTM → **Sequential Processing**

What domains have sequential processing and would be great for a LSTM model?

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Music, **Text Generation**, Handwriting, Video?

LSTM → **Sequential Processing**

The quick brown fox jumped over the lazy do_?

LSTM → **Sequential Processing**

The quick brown fox jumped over the lazy dog.

LSTM → **Sequential Processing**

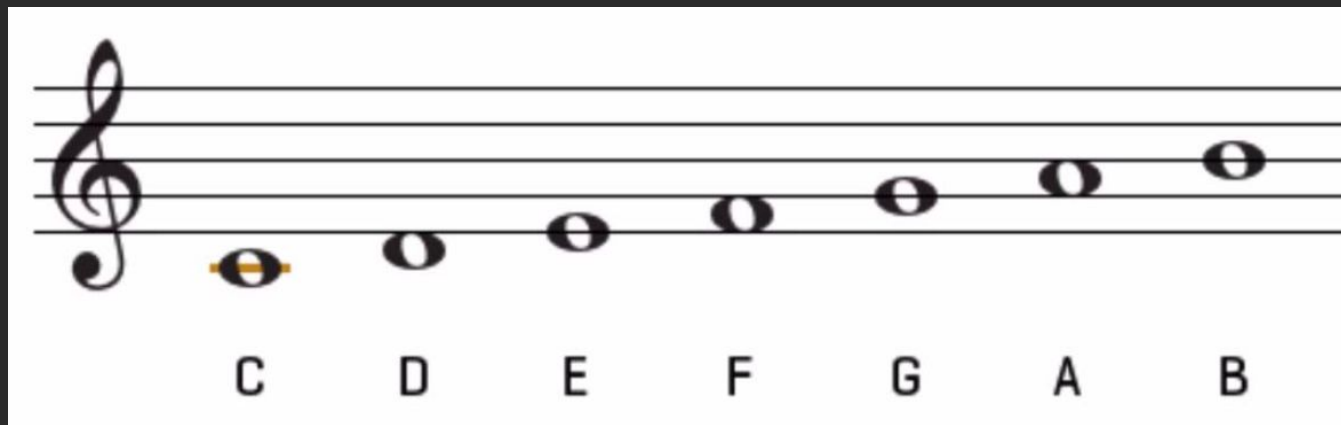The quick brown fox jumped over the lazy dog.

The quick brown fox jumped over the lazy dot.

The quick brown fox jumped over the lazy doe.

The quick brown fox jumped over the lazy dom.
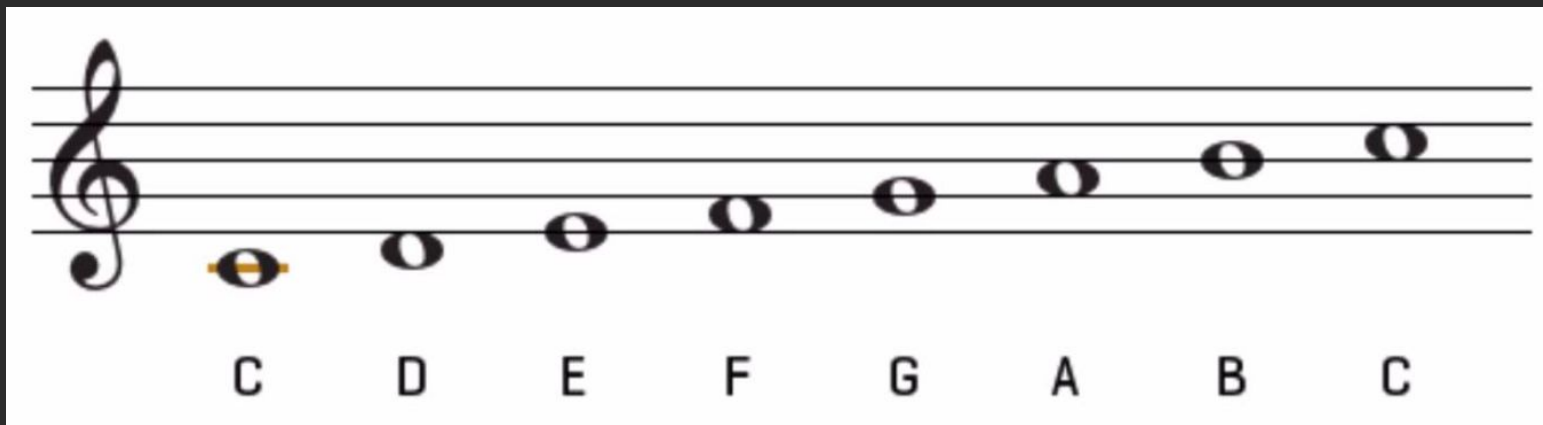
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How does it work?

Attempts to understand the *latent space* of a domain. Goal is to capture its statistical structure!

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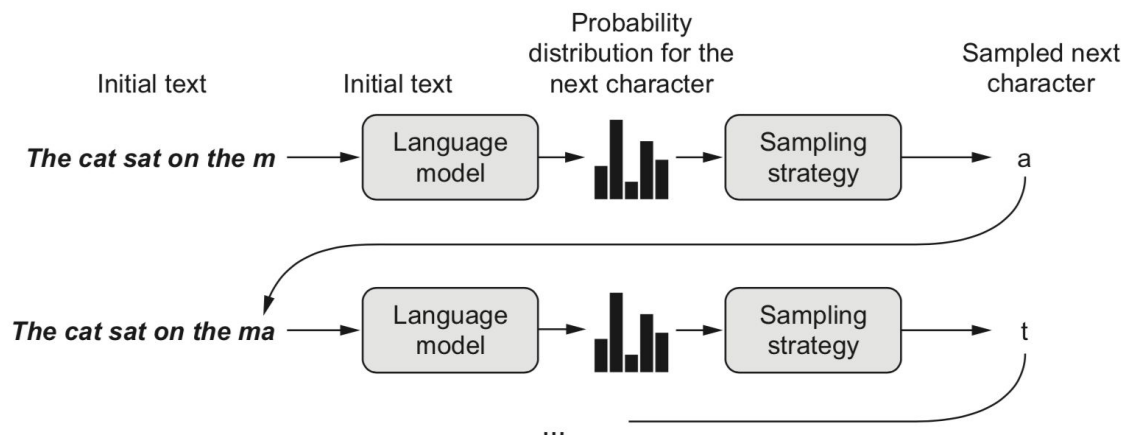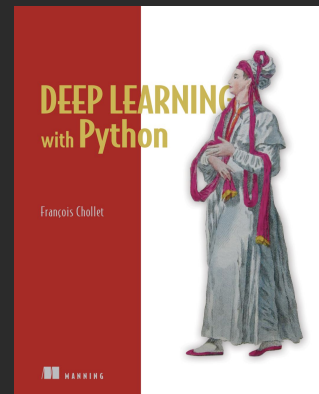

Figure 8.1 The process of character-by-character text generation using a language model

Making it work...

- Need sampling strategy!
- Should we always choose the most probable option?!
- Depends on our goals...

Making it work…

- **Greedy Sampling → Most probable**
- **Introduce randomness/stochasticity!**
- **Refer to this as the *temperature***

Making it work…

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- **Introduce randomness/stochasticity!**
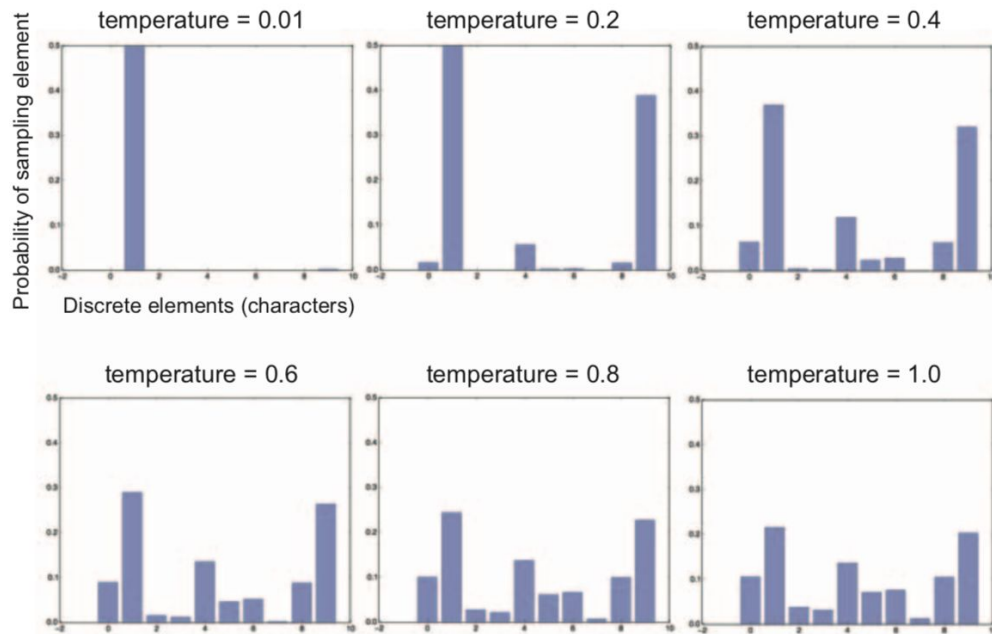- **Refer to this as the *temperature***

Making it work…

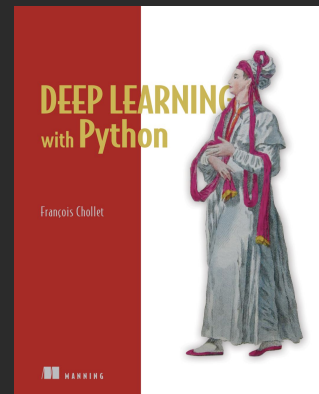Figure 8.2 Different reweightings of one probability distribution. Low temperature = more deterministic, high temperature = more random.

What type of data are LSTMs designed to work well with?

What type of space to LSTMs capture?

What parameters can we control when building our models? Think both model and data!

BREAK??

To The Notebook!

Goal:

Split into 5 groups and explain what each block of code is doing! Report back to class in 10 minutes. Use whatever resources you need!