Train language model: Grimm's first sentences

Every evening you read something to your little brother to put him to sleep. His favorite is the fairy tales by the Brothers Grimm. There are lots of them, but you are nearing the end of the book and therefore need more...

In this exercise, we will practise a simple language model for generating fairy-tale sentences. For each word, we will memorize what can come next.

Task 1

One sentence is already stored. Read it out of the model and write it down:

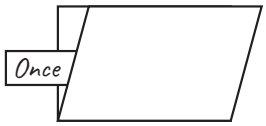
Task 2

Learn a new sentence for the model. To prepare, fold this sheet inwards along the bottom line to create a sleeve.

Then slide the cardboard strip with the new sentence into the paper sleeve and repeat the following steps to store the sentence in the language model >>>

1. *Slowly pull the cardboard strip to the left out of the sleeve until the first (or next) word is visible.*
2. *Search for the word in the language model. If it is not yet included, write it in a free space.*
3. *Connect the previous word with the new one using an arrow.*
4. *Continue with step 1.*

You have now stored a sentence into the language model. Repeat the exercise and store a second sentence.

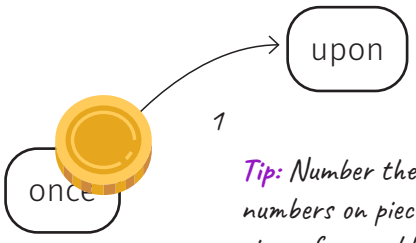


Generating new fairy tales with the language model

If you have already saved two sentences in your language model, you can start with task 3!

Task 3

Generate a sentence from your language model. Repeat the following steps »»»



Tip: Number the arrows mentally, write numbers on pieces of paper and draw a piece of paper blindly.

1. *Place a coin at the beginning of a sentence.*
2. *Write this word at the bottom.*
3. *If there is no further arrow, end the sentence with a period.*
4. *Choose an outgoing arrow at random and follow it to the next word with your coin.*
5. *Continue with step 2.*

Once

1. *One player places a coin at the start of a sentence on her language model. Everybody writes this word.*
2. *She randomly selects one of the arrows emanating from the current word, follows that arrow, and vocalizes the next word.*
3. *All players write down this word and check their own language models to determine if they also have stored this word.*
4. *If another player also has this word in their model, the coin is passed to them. If multiple players have this word, chance decides who receives the coin.*
5. *The player who receives the coin places the coin on the word in his model, and then proceeds from step 2.*
6. *The sentence is concluded with a period if it cannot be continued on any language model, meaning there are no further arrows leading from the current word.*

Task 4

We now combine several language models to draw on a larger vocabulary.

Form a group of 3 or 4 and place your language models on the table. Find a common word for the beginning of the sentence.

«« Repeat the following steps together on your language models.

TrainDL

Tasks for reflection

1. Compare the sentences you produced in tasks 1, 3 and 4 with each other. How do they differ, what do they have in common?

2. Discuss with your classmates whether the sentence you produced together could come from a fairy tale.

3. Estimate the number of possible sentences that can be formed from your language model.

4. Look for a place in the sentences from tasks 3 and 4 where it was decided at random how the sentence continues. Calculate the probability for each of the continuations, assuming that each arrow is equally probable.

5. Explain these quotes by describing how language models learn and generate sentences.

Language models are also known as “stochastic parrots”.

“Stochastic” is a process whose outcome is uncertain but statistically predictable.

The philosopher Hannes Bajohr says about chatGPT:
“We are bathing in our own alphabet soup.”

“Feeding language models with the beauty, ugliness and cruelty of the world, but expecting them to reflect only the beauty, is a fantasy.”
(Ruha Benjamin)

Grimm's example sentences

Print out the sheet and cut out the strips. Each person receives any two strips to complete the first task sheet (task 2).

Tip: print on colored paper (each group of 4 works with its own color)"

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once upon a time there was a young lad who had learned the locksmith trade.

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once upon a time there was a little child to whom his mother gave a little bowl of milk.

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once upon a time there was a young hunter who went into the forest to lie in wait.

---

once upon a time there was a stubborn child who did not do as his mother wished.

---

there was a poor man and a poor woman who had nothing but a little hut.

---

a father had two sons of whom the eldest was clever and wise.

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one day a farmer fetched his staff from the corner and spoke to his wife.

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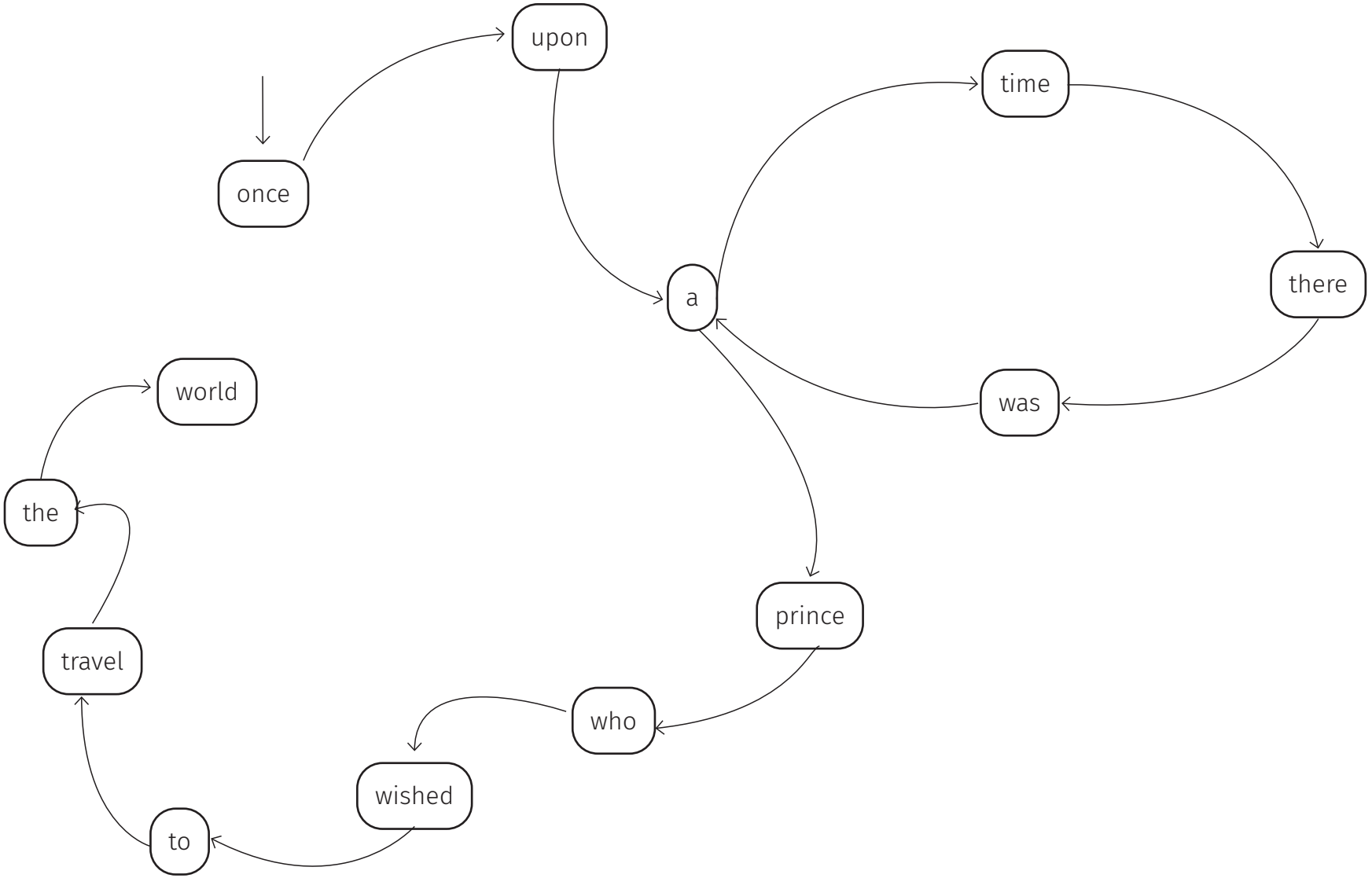
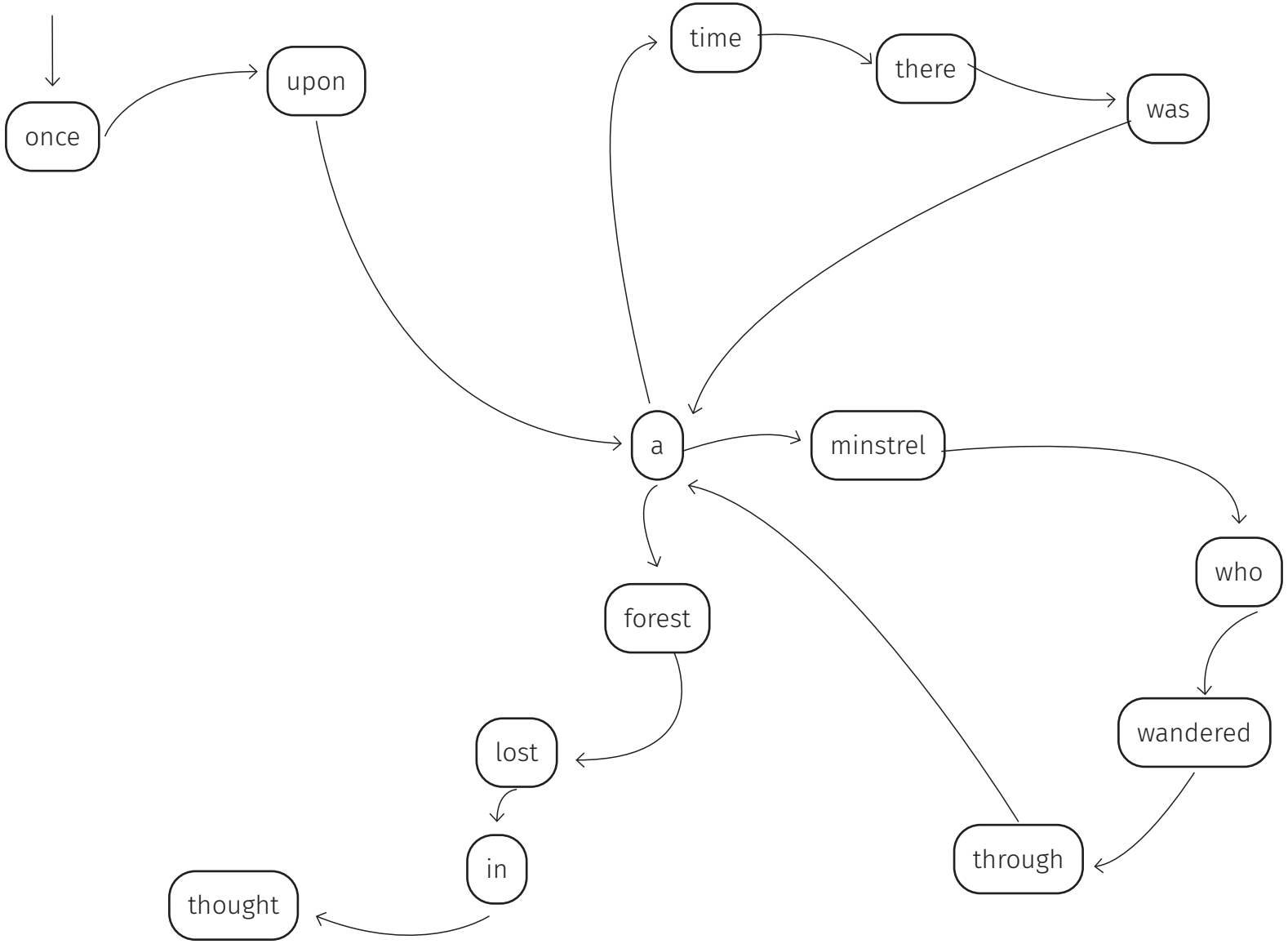
there was a man who had three sons and nothing more than the house in which he lived.

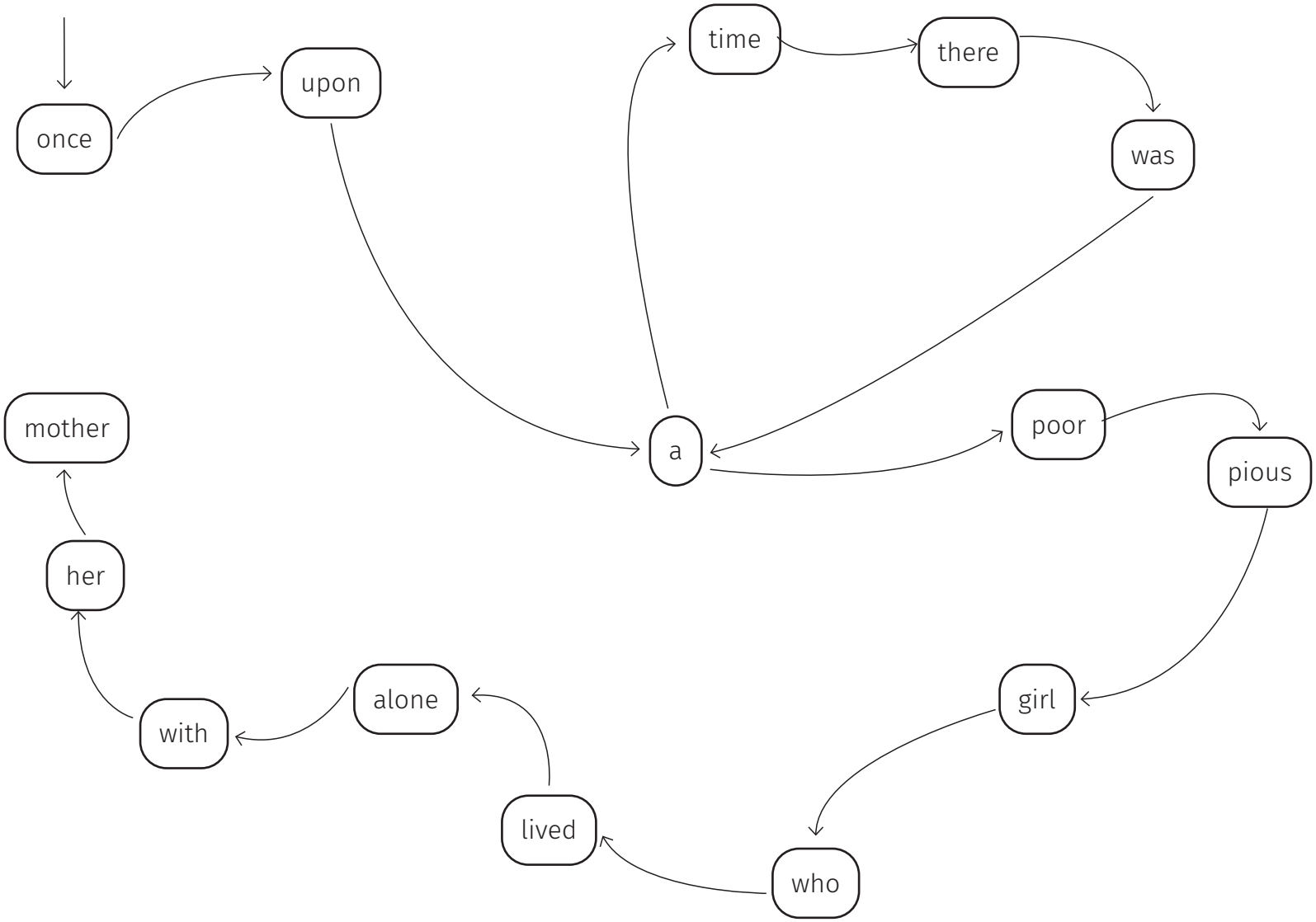
Your language model



Your language model



Your language model



Your language model