

DeepLexia

Translating Text to Images

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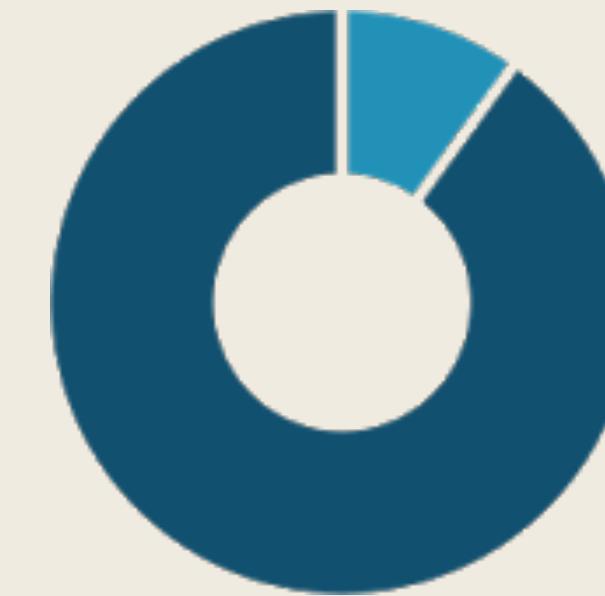
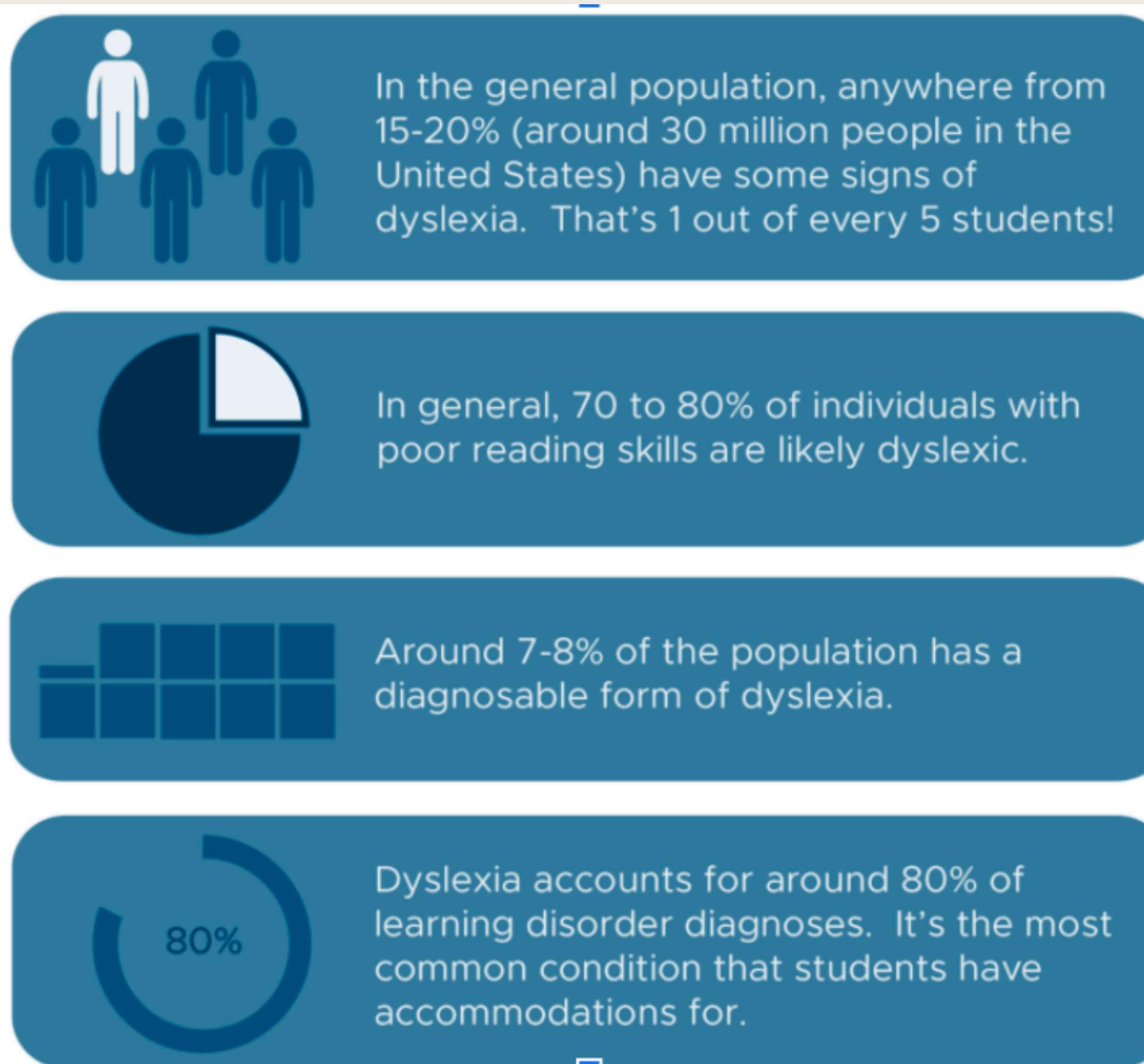
Overview

- 1. Motivation
- 2. Demo
- 3. Text to Image Challenge
- 4. Solutions
- 5. Improvements



1. Motivation

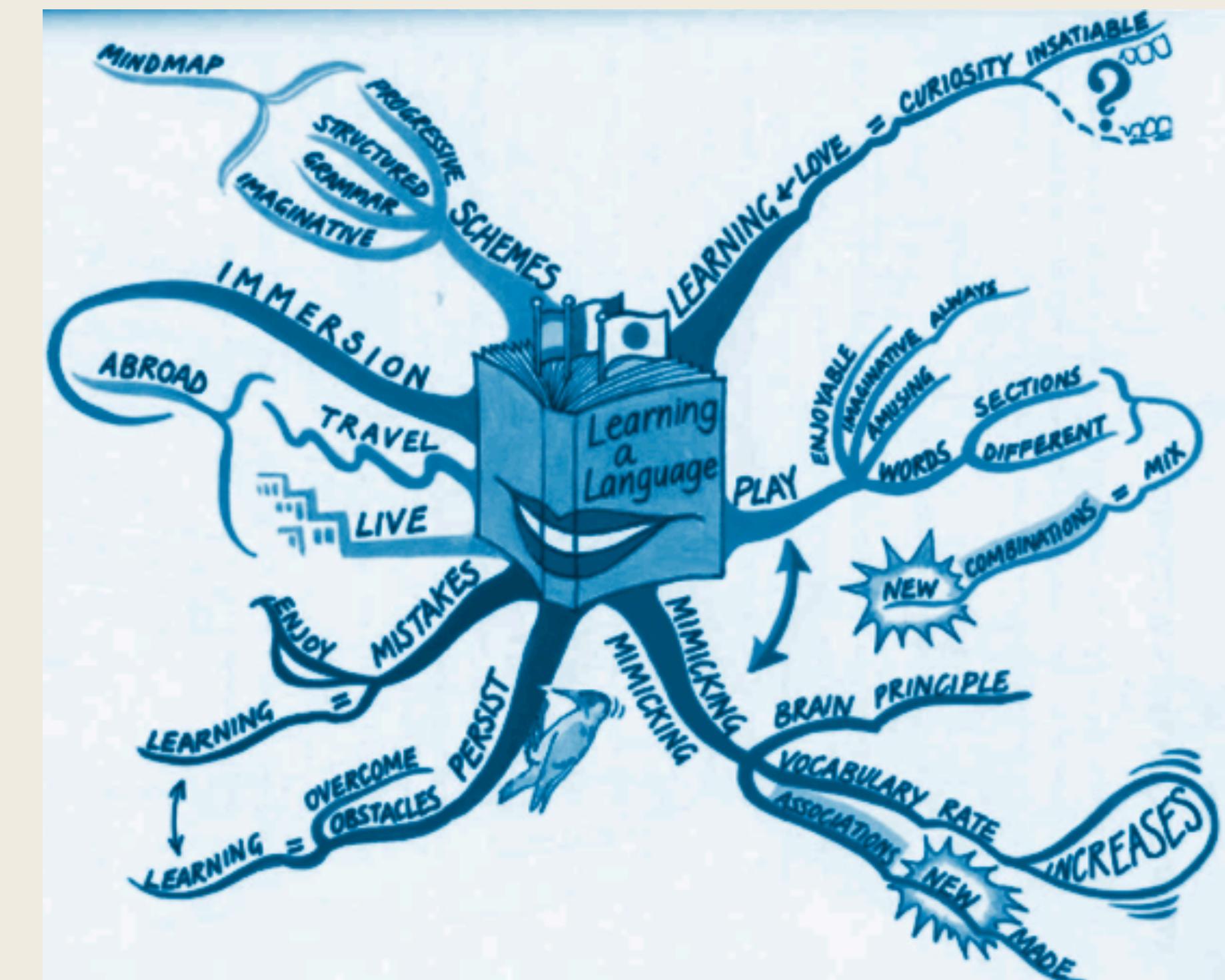
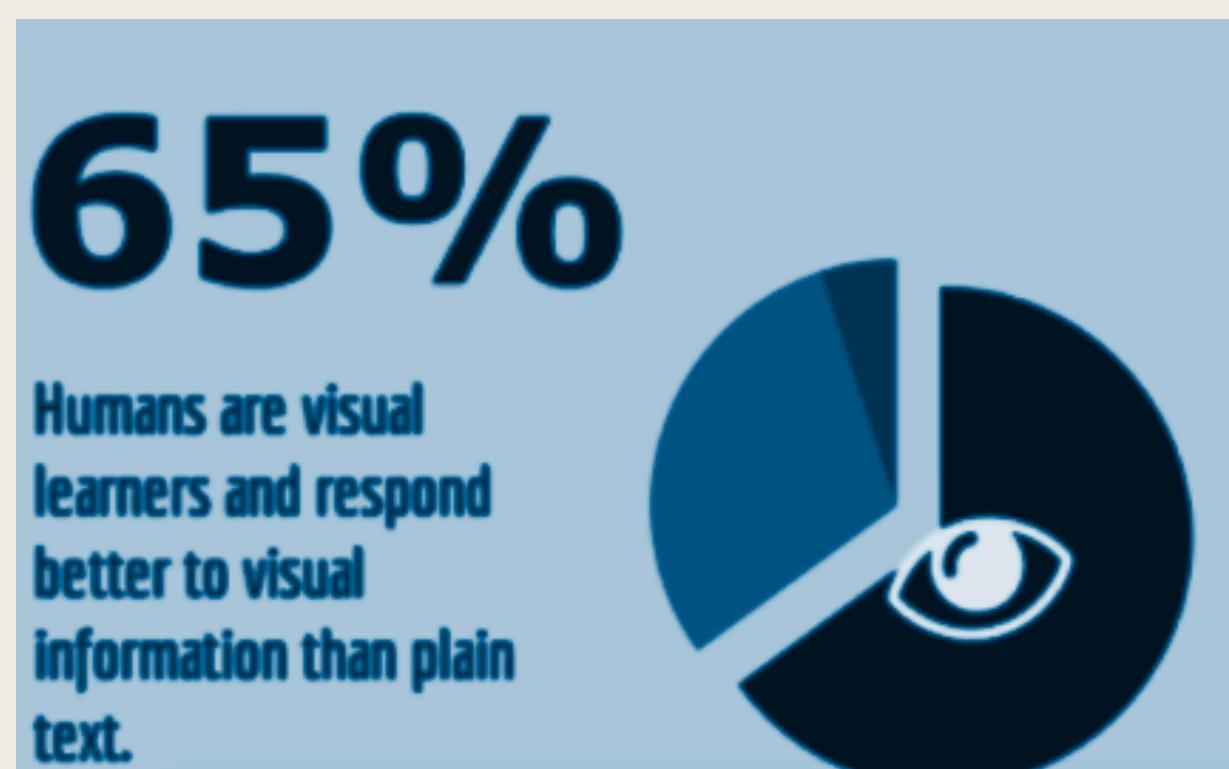
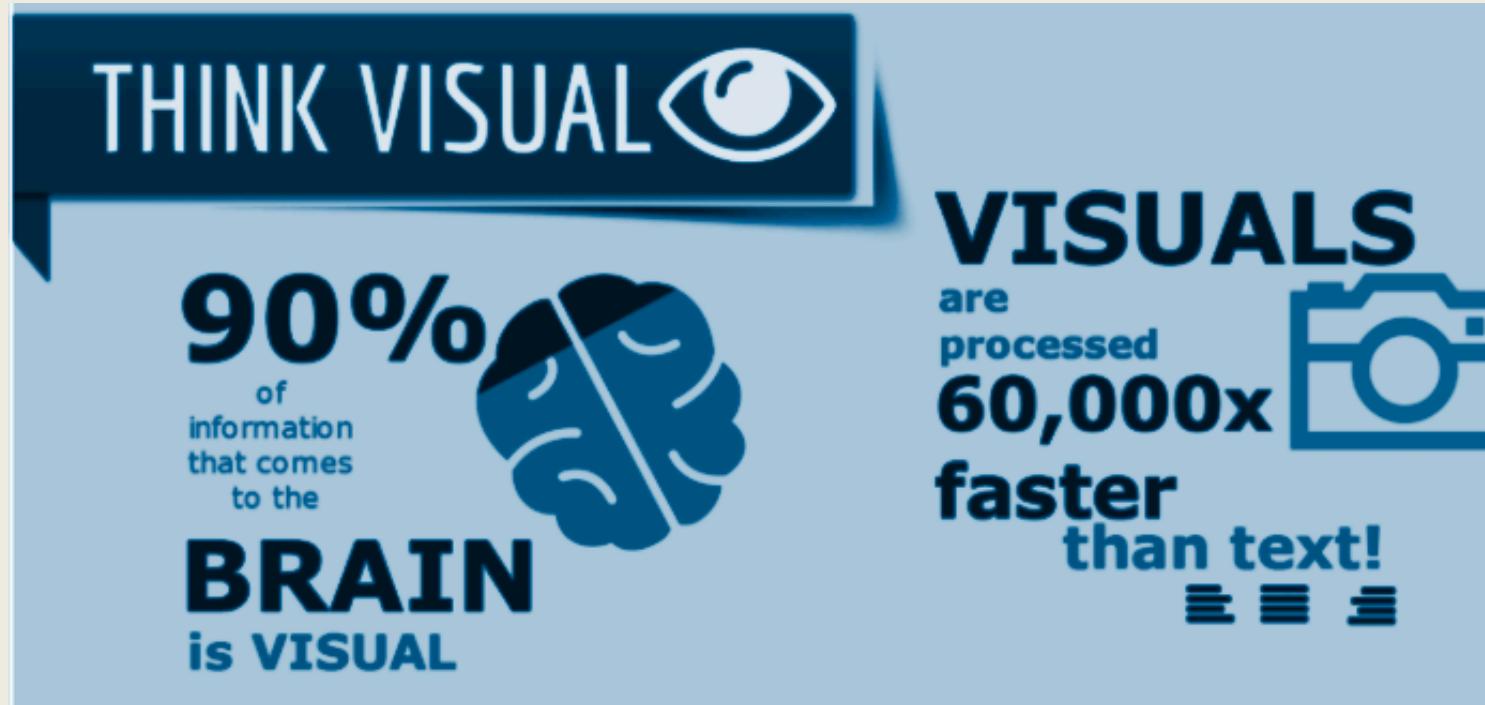
Dyslexia in some figures ...



1 in 10 of the population is estimated to have dyslexia

- Most common learning disability
- Difficulty with reading, writing and spelling
- Struggle with short term working memory

Imagine if you could read way faster?





2. Demo

Video

Non sécurisé | eastoftheweb.com/short-stories/index.php?p=web/library/children/all

eastoftheweb
shortstories CHILDREN'S CRIME FICTION HORROR HUMOR NONFICTION ROMANCE SCI-FI

SHORT STORIES

Ad Don't just release software. Unleash it. Enterprise test automation. Learn more Tricentis

Speed Changes Everything. Tricentis LEARN MORE

CHILDREN'S STORIES

- All Stories
- Contemporary Stories
- Classic Stories
- All Authors
- Top 20
- Subgenres:
 - Fairy Tales
 - Fables
- All Collections
- New Stories

Mehr als 20.000 Recruiter warten auf dich

CHILDREN > ALL STORIES

The Fox and The Crow
by Aesop
Classic fable. Moral: Do not trust flatterers.
- Length: 1 page
- Age Rating: U
- 418 Comments
★★★★★

The Tortoise and the Hare
by Aesop
Classic fable. Moral: Slow but steady progress wins the race.
- Length: 1 page
- Age Rating: U
- 232 Comments
★★★★★

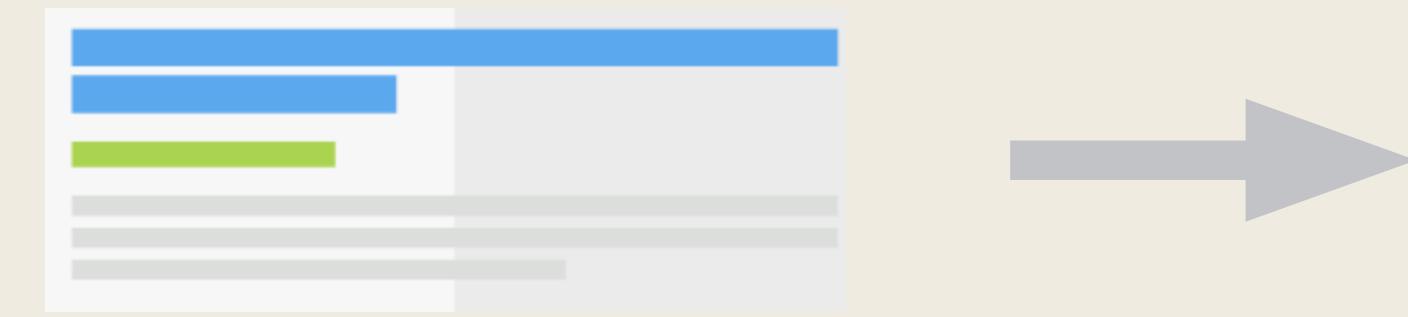
The Wolf in Sheep's Clothing
by Aesop
Classic fable. Moral: Appearances can be deceptive.
- Length: 1 page
- Age Rating: U
- 199 Comments
★★★★★

The Boy Who Cried Wolf
by Aesop
Classic fable. Moral: There is no believing a liar, even when he speaks the truth.

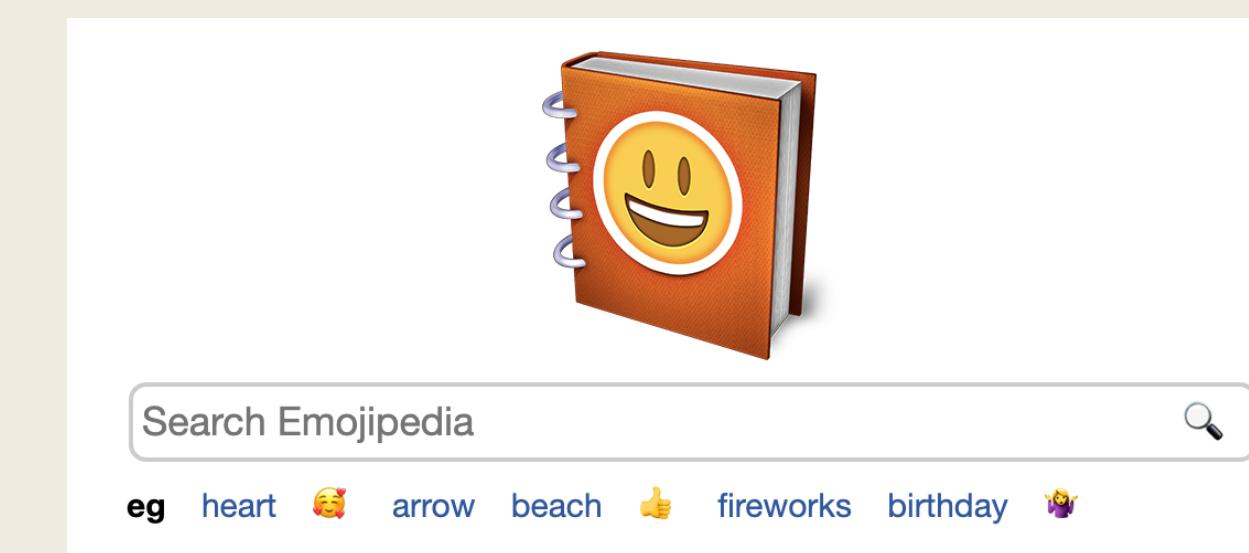
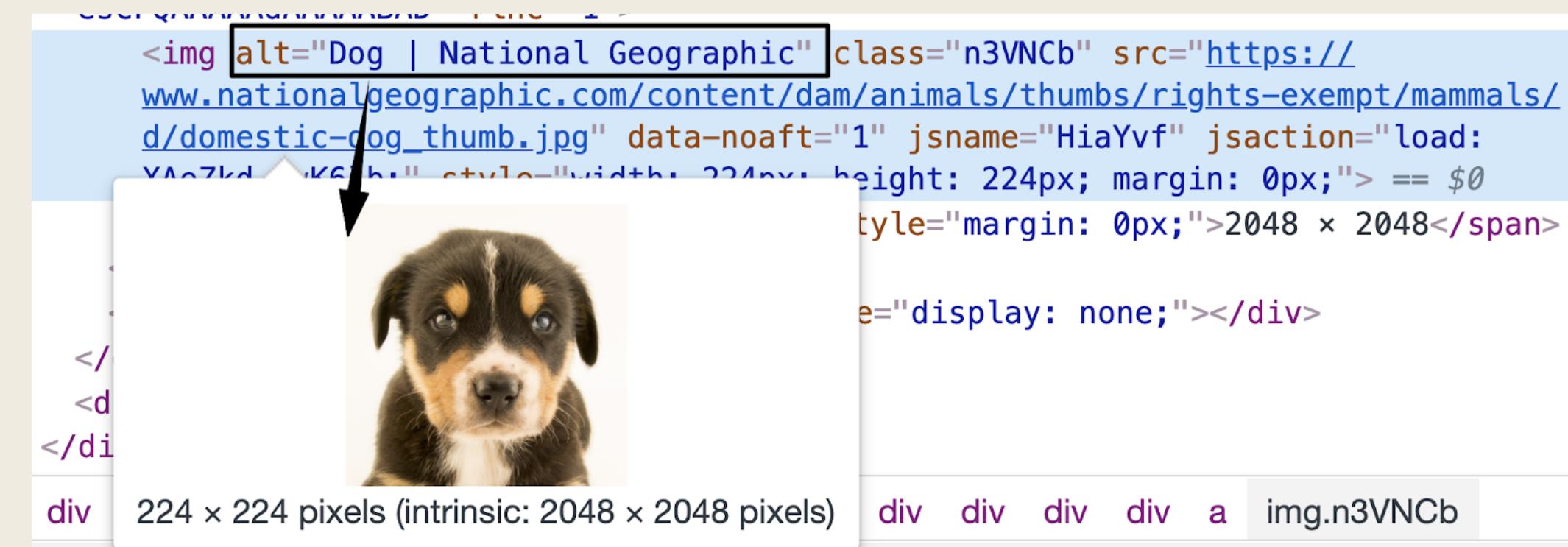


3. Text To Image Challenge

From Text To Visual

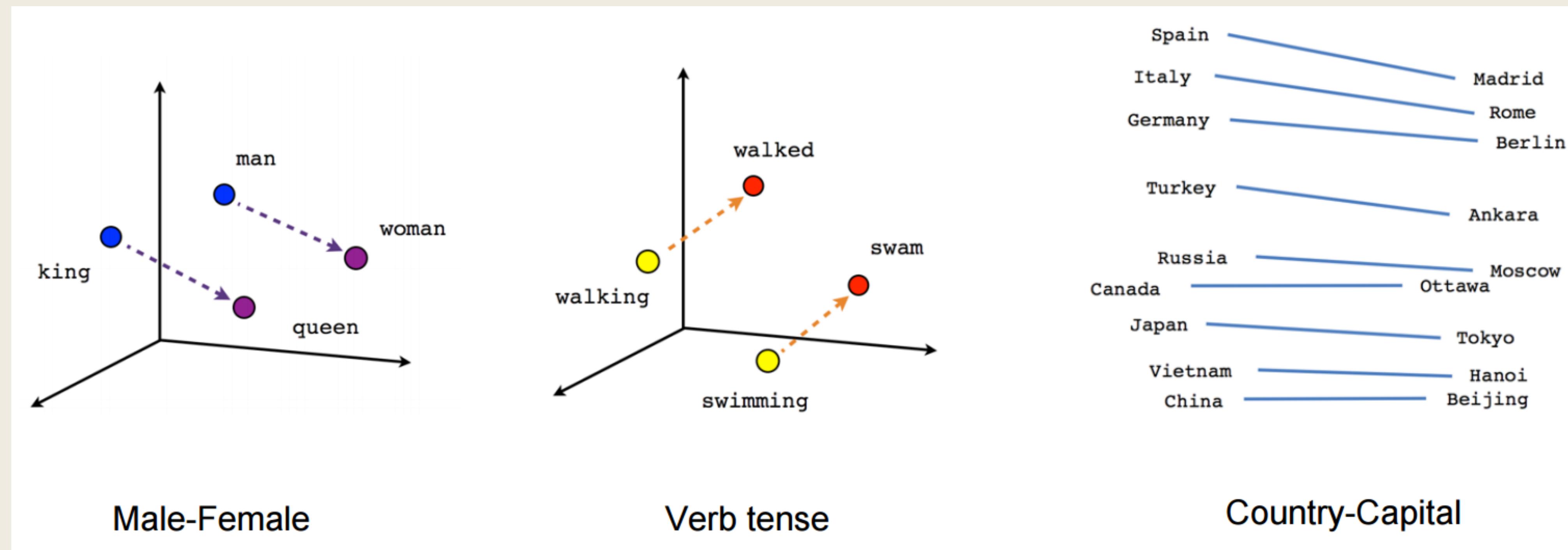


- **Need for DATA**
- **First Idea:**
 - Google images
 - Scraping html image description
- **Proof of Concept:**
 - Emojis -> names / descriptions
 - Scraping Emojipedia

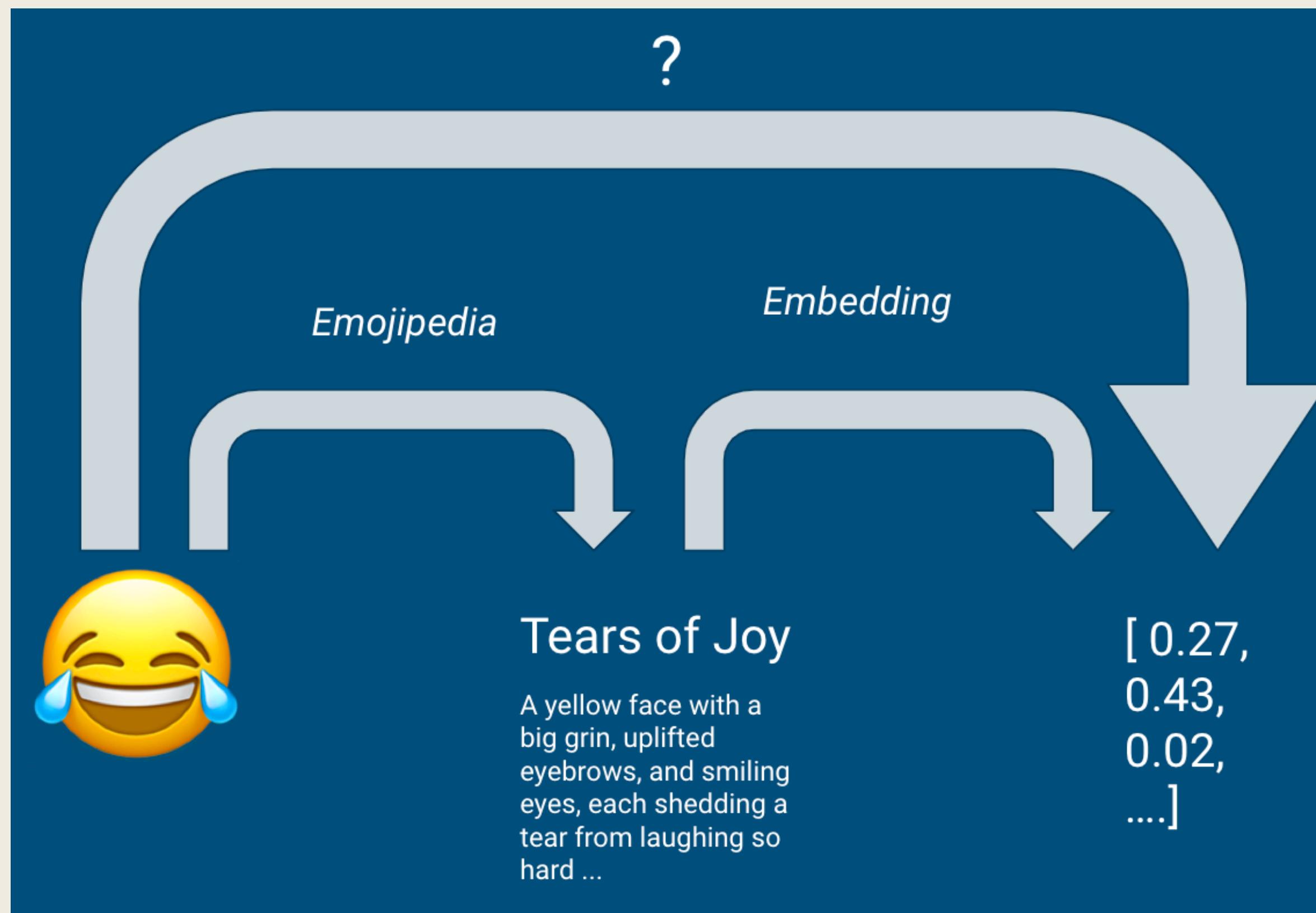


How do we extract meaning?

Embeddings



Emojis to Vectors?



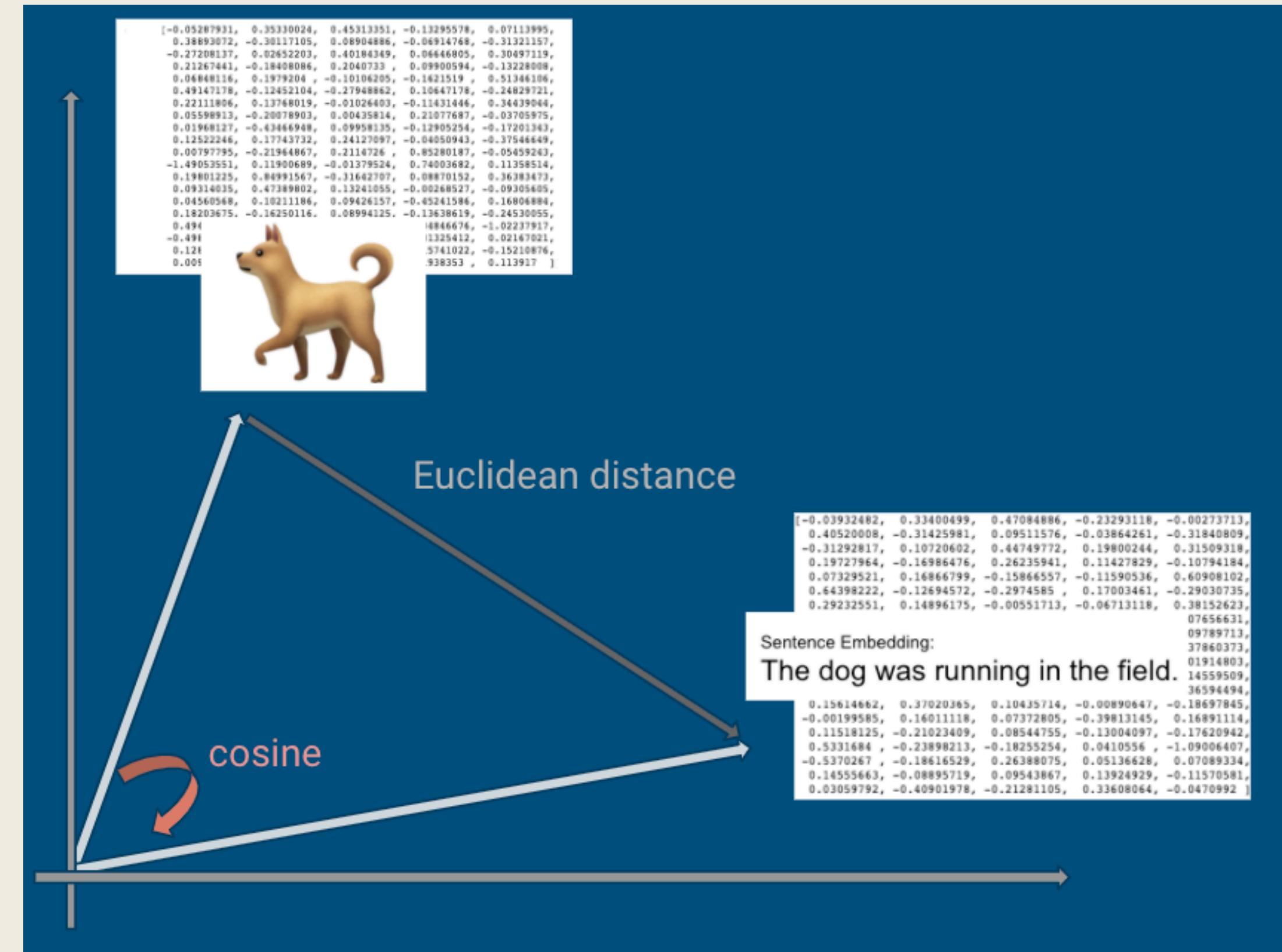


4. Solutions

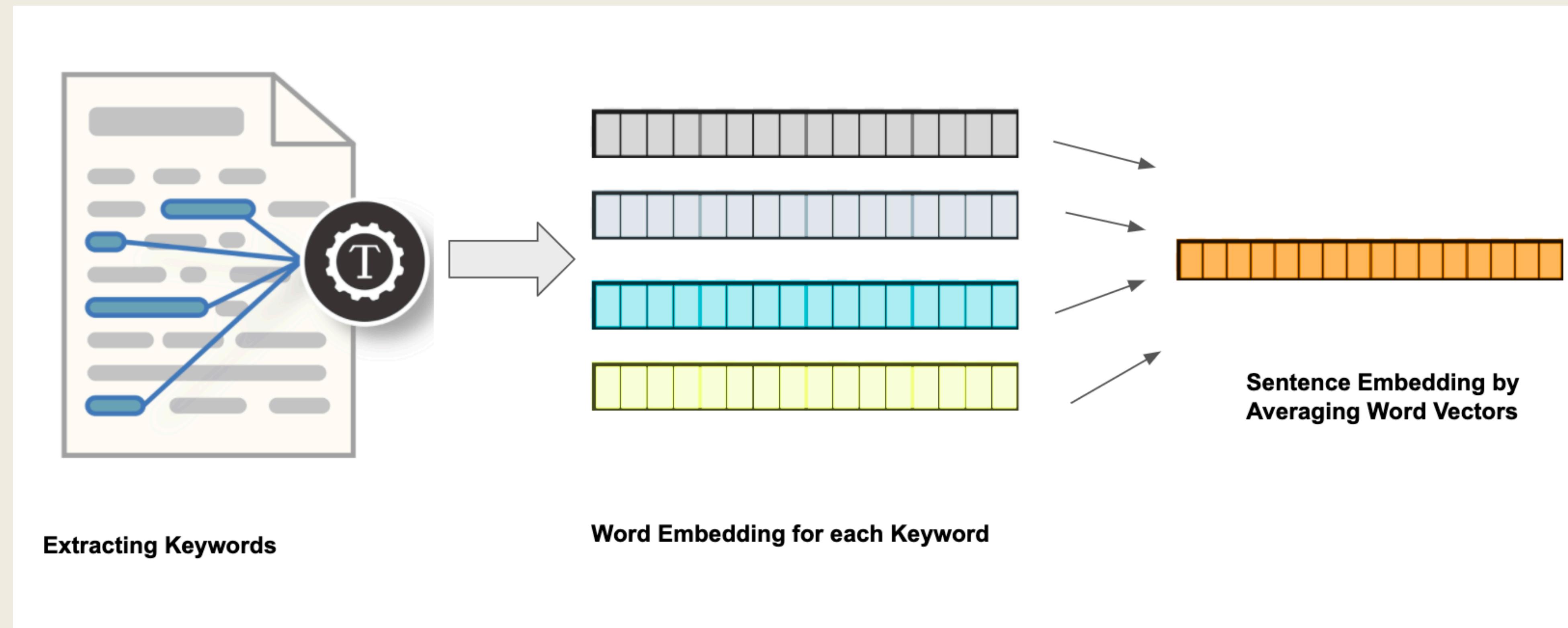
- A. Computing Similarities
 - B. Training a Classifier
-

A. Computing Similarities

Similarities In Vector Space



Sentence embedding



Result

Sentence Embeddings

IRON HENRY

['👑', '✖', '↖']

In old times, when wishing was having, there lived a King whose daughters were all beautiful, but the youngest was so beautiful that the sun itself, which has seen so much, was astonished whenever it shone in her face.

['👸', '😎', '🤴', '❤️', '👸']

Close by the King's castle lay a great dark forest, and under an old lime-tree in the forest, was a fountain.

['🌲', '🏰', '⛲']

Key Words

Close by the King's castle lay a great dark forest, and under an old lime-tree in the forest, was a fountain.

King --- EMOJI ---> ['👑', '🦁', '🤴']

castle --- EMOJI ---> ['🏰', '🏰', '🏡']

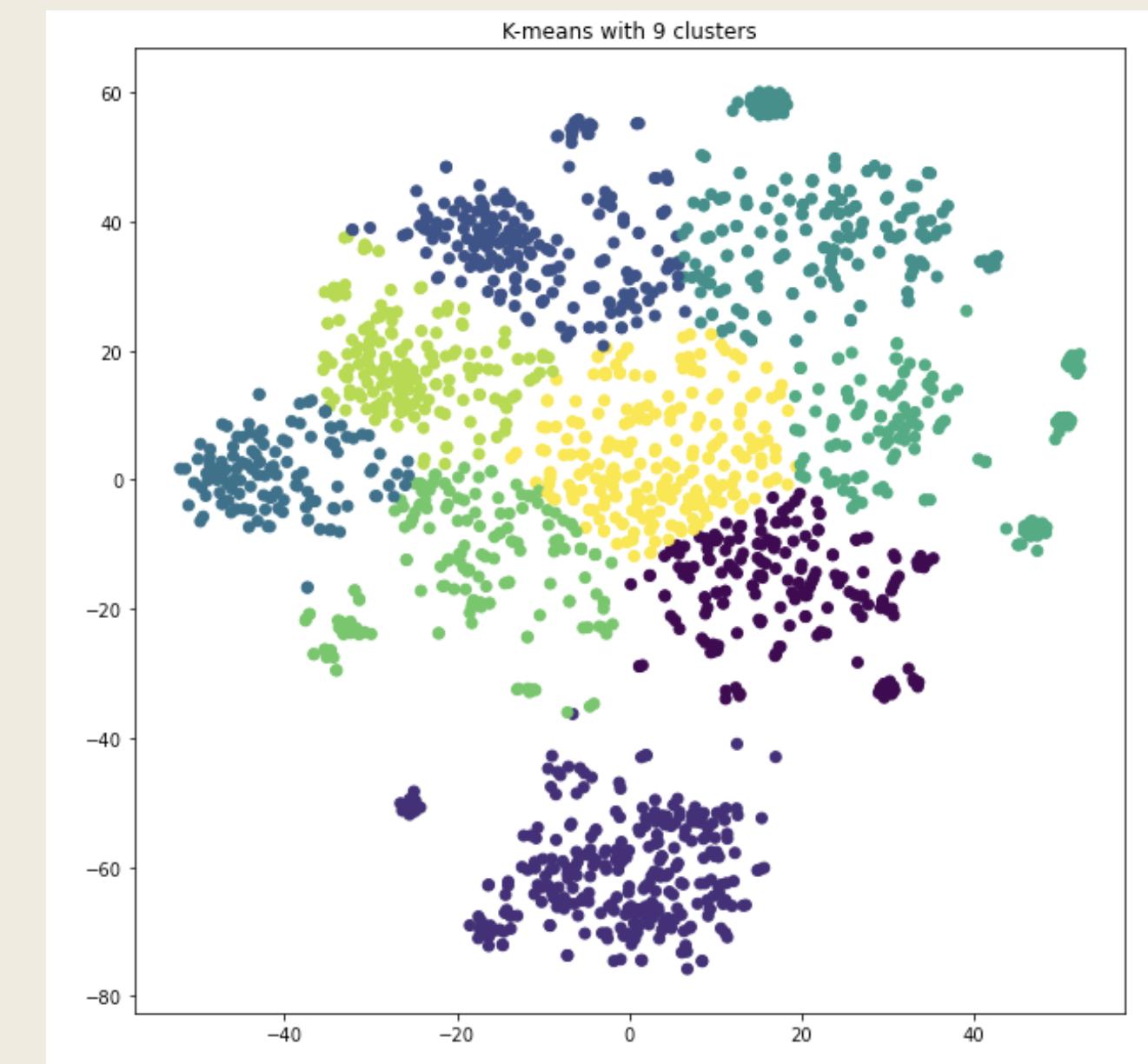
forest --- EMOJI ---> ['🌲', '🌳', '🏔️']

B. Training a Neural Network Classifier

But before ...

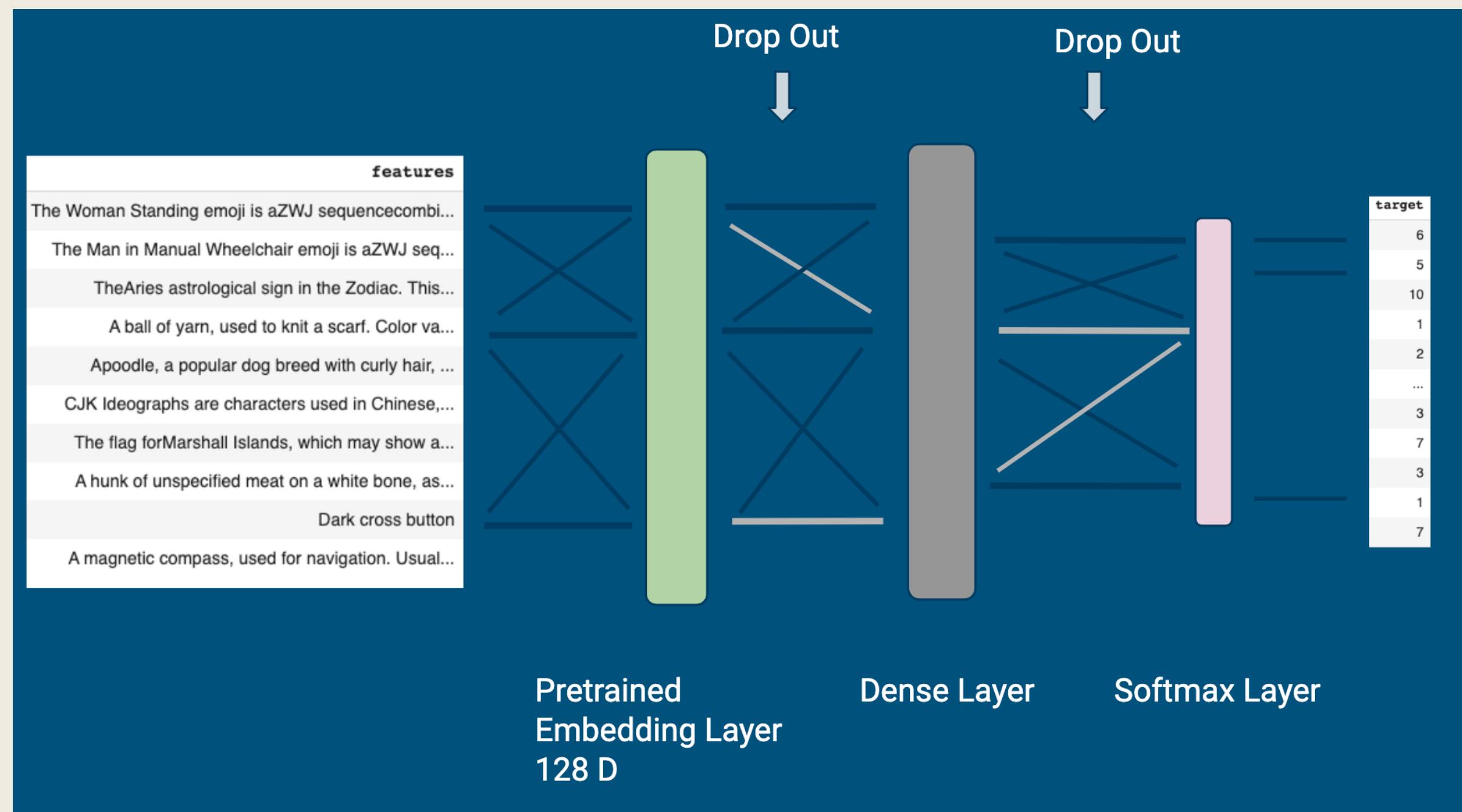
Clustering

- Emojipedia ~1800 different emojis => need for fewer classes
- Clustering:
 - K-Means
- Using original emoji groups/subgroups => 12 classes



- 😊 Smileys & People
- 🐾 Animals & Nature
- 🍔 Food & Drink
- ⚽ Activity
- 🛌 Travel & Places
- 💡 Objects
- 💻 Symbols
- 🇺🇸 Flags

1. Classifier with pretrained Embedding



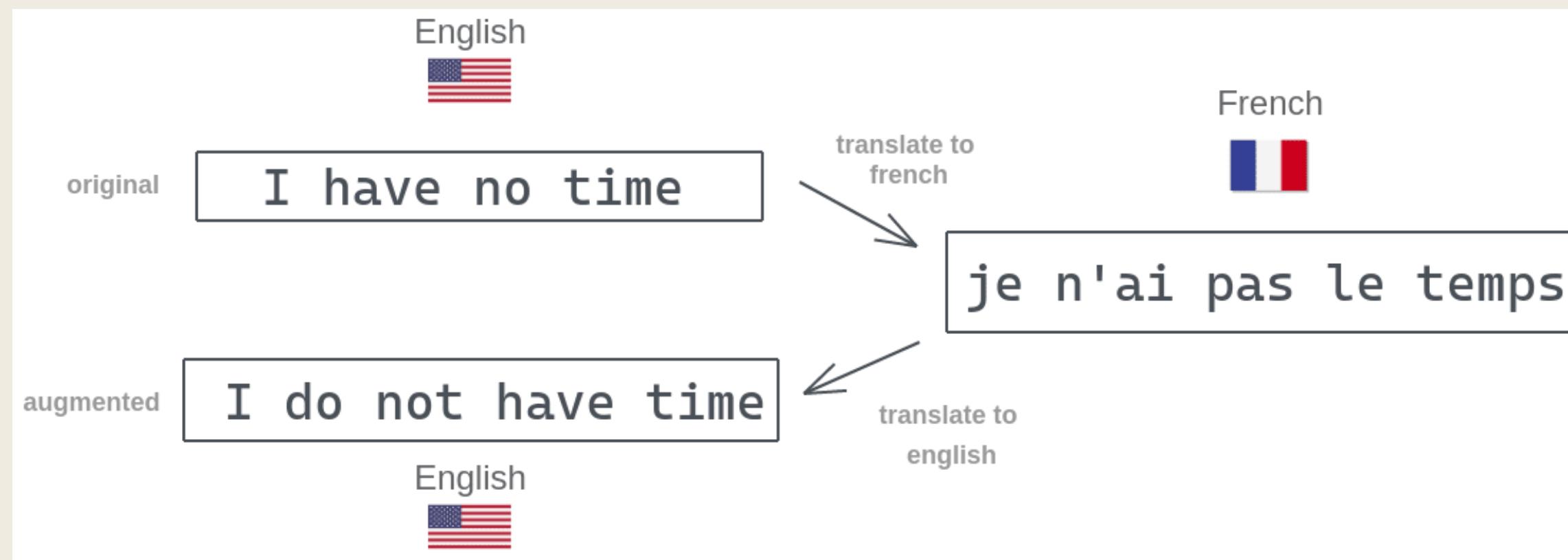
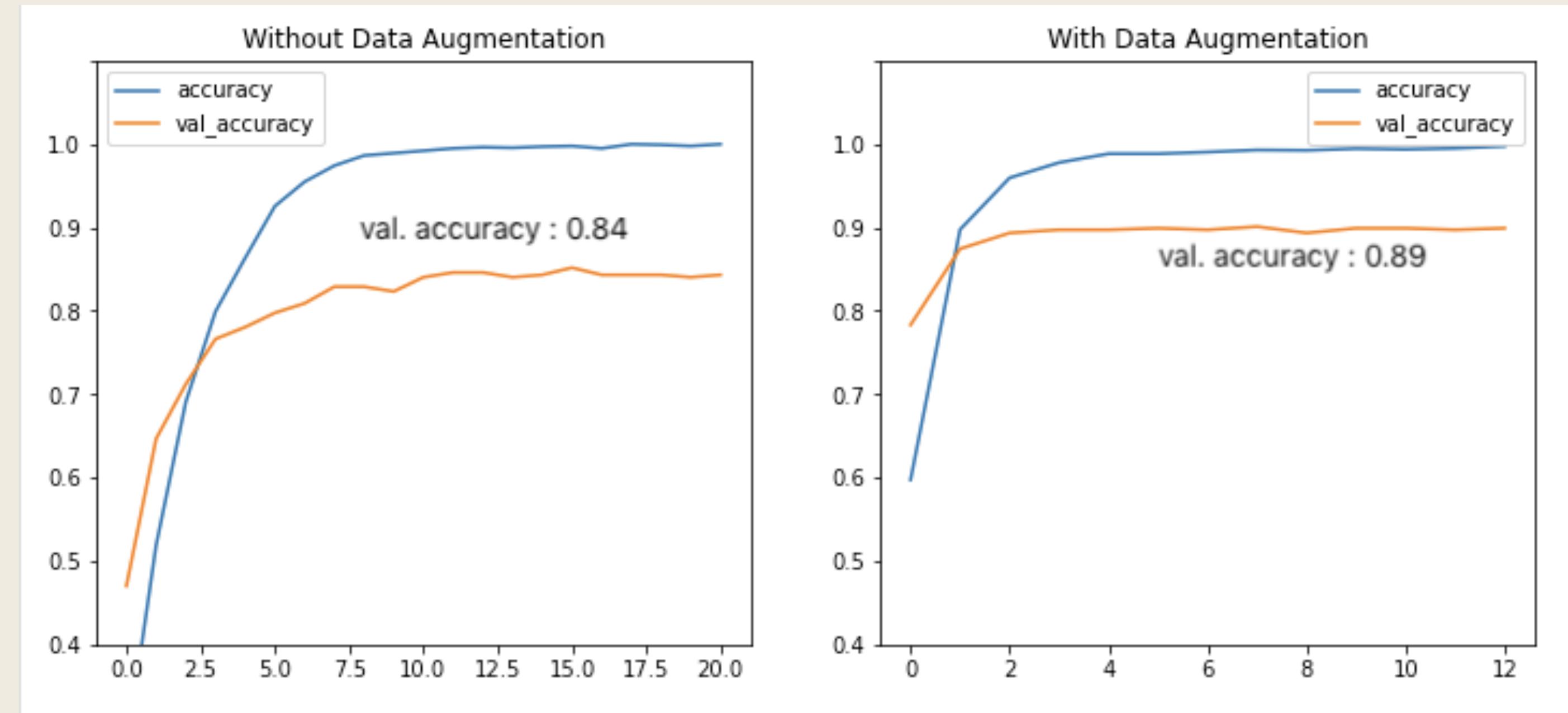
Data

Main Issue:

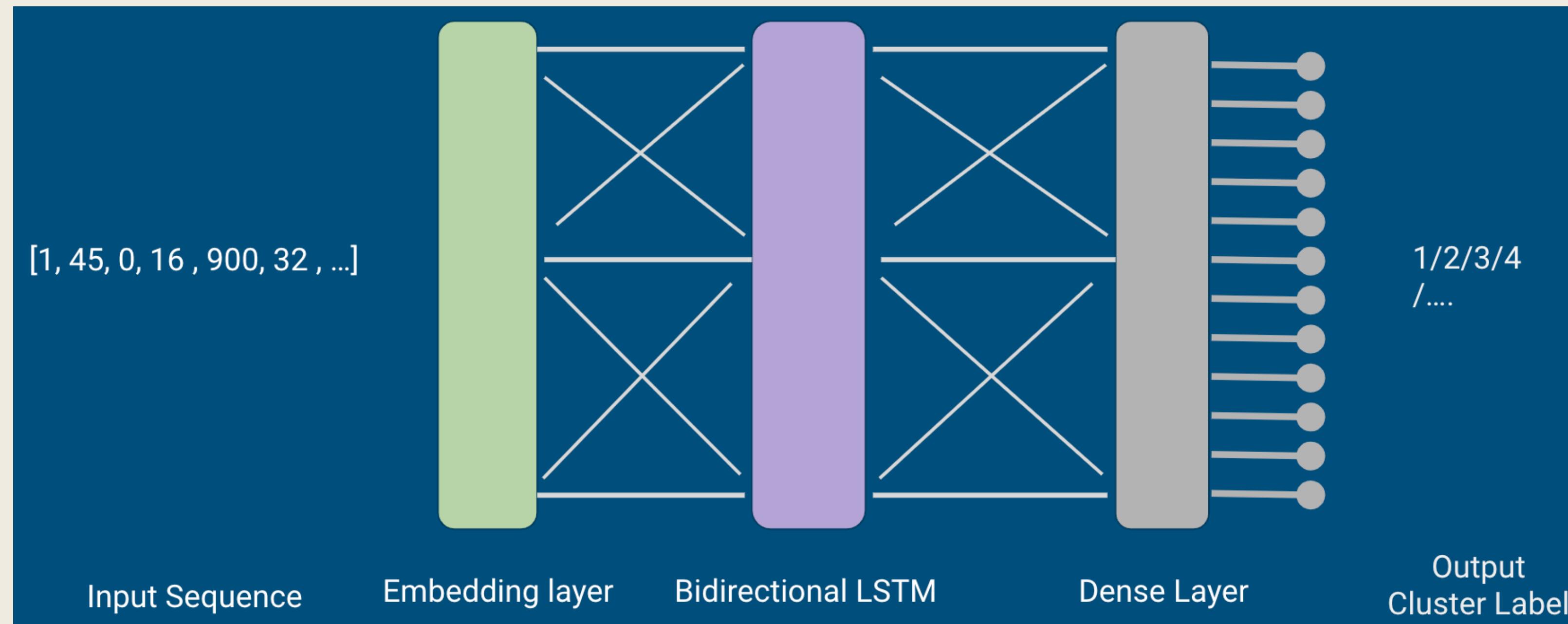
- Not enough Data

=> model learns the dataset by hard

- Data Augmentation



2. Classifier using LSTM





5. Improvements Down the road

Improvements

1. Data Augmentation

- A. Synonyms
- B. Swap words
- C. Delete words

2. Manual Data Labeling

3. Dealing with unbalanced classes

4. Move from emojis to images

Manual Data Labeling

```
HERE 's CURRENT SENTENCE <-> EMOJI COMBINATION
-----
and said Dear Children I have to

[(0, '👶'), (1, '🧒'), (2, '👦'), (3, '👧'), (4, '👲'), (5, '❤️'), (6, '👨\u200d℉'), (7, '👩'), (8, '👱\u200d℉'), (9, '👳'), (10, '👳'), (11, '👲'), (12, '👲'), (13, '\U0001f971'), (14, '👲\u200d👲\u200d👲'), (15, '👉'), (16, '👲\u200d👲\u200d👲\u200d👲'), (17, '👲'), (18, '👲'), (19, '👲\u200d👲\u200d👲')]

    IF you want to keep the first emoji of the list type : f
    IF you want to choose another emoji of the list type : o
    IF you don't want to keep any of the emojis type: n
    IF you want to stop for now and save the changes made type: s
    If you're FINISHED and want to save to a DATAFRAME type: df
f

HERE 's CURRENT SENTENCE <-> EMOJI COMBINATION
-----
go into the forest <SPACE> <SPACE> <SPACE>

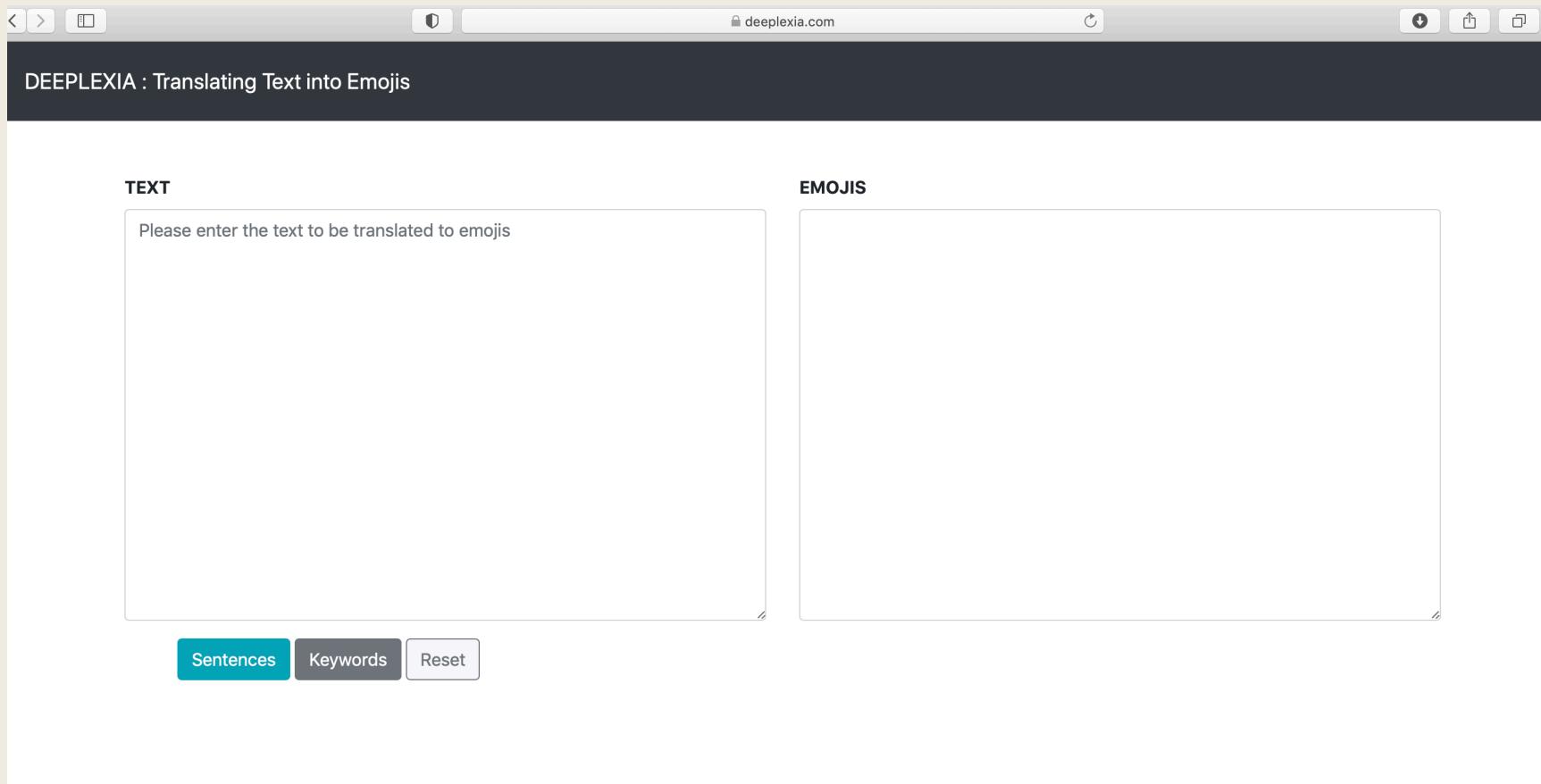
[(0, '🌲'), (1, '🌳'), (2, '^K'), (3, '🌿'), (4, '🌴'), (5, '👉'), (6, '🚂'), (7, '☁️'), (8, ' Spells'), (9, '🏞'), (10, '🔮'), (11, '🧙'), (12, '⏳'), (13, '☀️'), (14, '🧙'), (15, '🧙'), (16, '🧙'), (17, '⏳'), (18, '🌵'), (19, '\U0001f971')]

    IF you want to keep the first emoji of the list type : f
    IF you want to choose another emoji of the list type : o
    IF you don't want to keep any of the emojis type: n
    IF you want to stop for now and save the changes made type: s
    If you're FINISHED and want to save to a DATAFRAME type: df
```

Simple is Better

Check it out ...

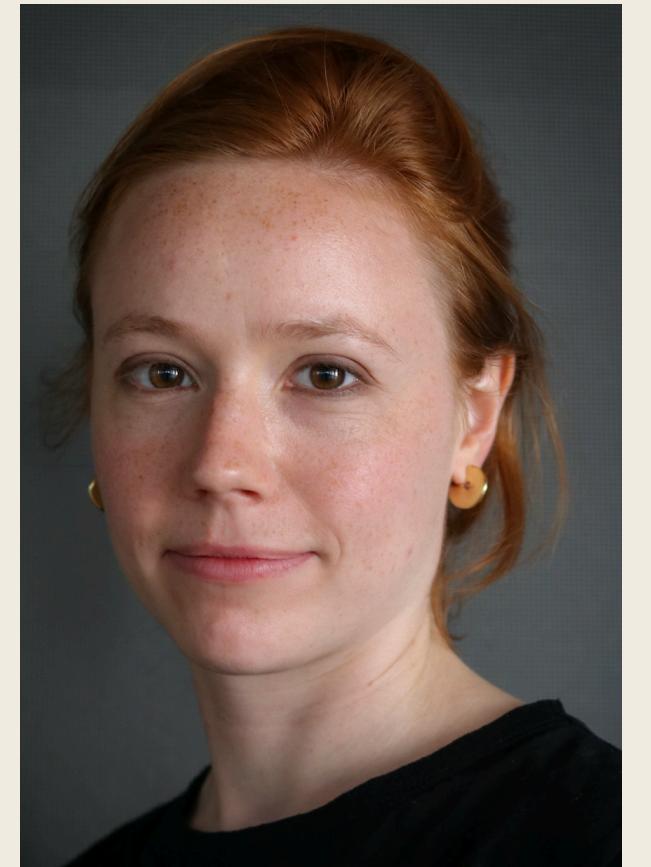
www.deeplexia.com



<https://github.com/jdharveng/deeplexia>

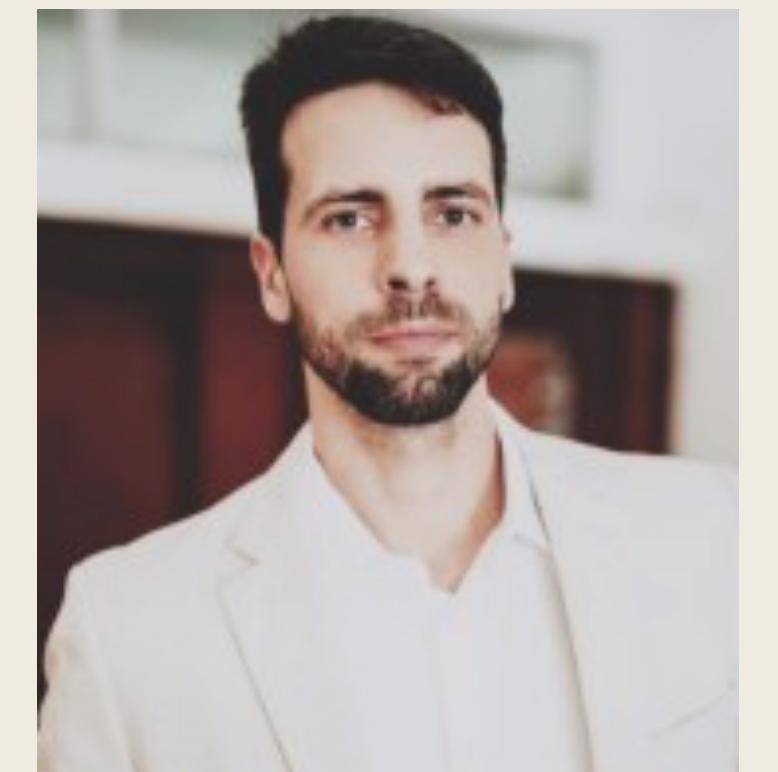
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- Any Questions ?