

# Exercise

## “Long Short Term Memory (LSTM) for Natural Language Processing”

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#### Introduction:

Text, as this sentence here, can be seen as a time series, since it is a series of words (or characters). That is why it may not be surprising, that LSTM models are widely used for processing text (Natural Language Processing, NLP).

In this exercise you are free to choose one area of NLP. Then prepare a Jupyter notebook that shows how to use a LSTM model to solve a NLP task in this area using Keras.

#### Detailed steps:

##### 1. Search for example code in Keras

There are many resources that show how to use LSTM models for NLP. Here are some example areas that fall into the category of NLP:

- Classification:
  - Sentiment analysis: Is the text formulated positively or negatively?
  - Text language: What is the language of the text: German? English? Spanish? etc.
- Prediction:
  - Given a sequence of words, what is probably the next word?
  - Given a sequence of letters, what is probably the next letter?
- Translation:
  - Given a sequence of words in language X, translate to a sequence of words in language Y
- Generation:
  - Given a training set of example texts, generate a new text that is “similar” to the texts contained in the training set
  - Automatic captioning (most often combinations of CNN+LSTM models): Given an image as input, generate a text describing this image
  - Automatic image generation: Given a text describing an image, generate an image (!)

##### 2. Understand the example code and prepare a demo

Understand the example code you have found and prepare a Jupyter notebook where you teach your fellow students step-by-step how the NLP task is solved with the help of Keras.

How do you represent text?