

# Deep Learning and Temporal Data Processing

LSTM in TensorFlow

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**Synthetic Sequence Dataset**

**Learning to Count**

**References**

# Synthetic Sequence Dataset

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For this practice I prepared a **synthetic dataset** consisting in  $2^{20}$  **binary sequences**.

You can find it in `synthetic_dataset.py`.

Loading the data is as simple as:

```
from synthetic_dataset import SyntheticSequenceDataset  
synthetic_dataset = SyntheticSequenceDataset()
```

# Learning to Count

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Our task is to **count the number of ones in the binary sequences**.

The goal of this practice is to implement and train a **LSTM** [1] network to do so.

To this purpose, you may find useful the following functions:

- `tf.contrib.rnn.LSTMCell`
- `tf.nn.dynamic_rnn`
- `tf.transpose`
- `tf.gather`
- `tf.layers.dense`

Please refer to the docs to know the exact API.

Good Luck!



## References

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[1] S. Hochreiter and J. Schmidhuber.

**Long short-term memory.**

*Neural computation*, 9(8):1735–1780, 1997.