Sequence Labelling with Neural Networks

Natural Language Understanding

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Objectives

- Understanding
  - Pytorch library
  - Data processing
  - Sequence labelling and Text classification tasks
  - Multi-task learning framework
  - Train a Recurrent Neural Network model
- Learning How to:
  - Load the text into an RNN
  - Create batches dealing with sequences
  - Define a neural network
  - Train and test a neural network
  - Setup the Network for Multi-Task learning

Outline

- Introduction
  - Sequence Labelling (Slot filling)
  - Text classification (Intent Classification)
- Loading text
  - Words to indexes
  - Special tokens
  - Customize the Dataset class
- Batches
  - Usage of DataLoader class
  - Pad sequences
  - Pack padded sequences

Outline

- Neural Networks in Pytorch
  - Indexes to Vectors (aka embedding layer)
  - Implementation of an RNN
  - Illustration of regularization techniques
- Train and Test a Neural Network
  - Iteration over batches
  - A plot of the loss of the RNN

*If we have time Huggingface models

References

- **Pytorch Datasets and Data Loader:**
  - https://pytorch.org/tutorials/beginner/basics/data_tutorial.html
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- **Multi-task learning an Overview:**
  - https://ruder.io/multi-task/
- **Regularization and Optimization techniques:**
  - Merity, S., Keskar, N. S., & Socher, R. (2018, February). Regularizing and Optimizing LSTM Language Models. In International Conference on Learning Representations.