Named Entity Recognition – Step 5

Final experimental setup for train/test

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1. Introduction

1) Problem

Named entity recognition is a fundamental question to answer along the path of developing machines that are able to understand language more generally. Recall when we begin to learn a foreign language, we need to build a relation between each word with a concept. Training machines to "understand" sentences is a similar process, machines first need to "understand" words. That's why NER systems are often used as the first step in question answering, information retrieval, co-reference resolution, topic modeling, etc.

2) Environment requirement

For basic model, we develop with **sklearn.**

For advance model, we develop with **Kears+tensorflow**

3) Datasets

We use Stanford restaurant dataset for this problem.

This dataset contains the following tags to be assigned to each words:

Tags: 'B-Rating' 'I-Rating' 'O' 'B-Amenity' 'I-Amenity' 'B-Location' 'I-Location' 'B-Restaurant_Name' 'I-Restaurant_Name' 'B-Price' 'B-Hours' 'I-Hours' 'B-Dish' 'I-Dish' 'B-Cuisine' 'I-Price' 'I-Cuisine'

2. Basic models

1) Learning models

For learning models, we developed four basic classifier: perceptron, SGDclassifier, MultinomialNB and Passive Aggressive Classifier. In the following forms, we report the weighted average of precision, recall and f1-score to compare performance.

	precision	recall	F1-score

perceptron	0.43	0.61	0.46
SGDclassifier	0.54	0.61	0.47
MultinomialNB	0.81	0.82	0.81
Passive Arrgressive	0.62	0.47	0.48

2) Inference models

For inference models, we develop conditional random field(CRF).

	precision	recall	F1-score
CRF	0.90	0.89	0.89

3. Advanced models

1) Study different learning model

In this section, we plan to use different leanring model combined with CRF as inference model and compares performance.

	precision	recall	F1-score
LSTM+CRF	0.87	0.87	0.87
CNN+CRF	--	--	--

2) Study different embedding methods

In this section, we plan to use different embedding methods and compares the performance. We use Bert and word2vec as embedding separately and combined with lstm and crf.

	precision	recall	F1-score
Bert+LSTM+CRF	0.87	0.87	0.87
Word2vec+LSTM+CRF	--	--	--