User Response Classification Challenge

Adrien Cogny
Cornell Tech
ac2753@cornell.edu

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Abstract

Abstract Text

I. Introduction

Chatbots are used in many applications today: customer support, flight booking, scheduling meeting, ordering food and many more. The application of a chatbot explored in this dataset is for a therapy chatbot. These types of chatbot, while very effective, may require human intervention. Determining when a human should intervene can be quite important, in this case when a person requires help in dealing with a complex situation, and requires tools to identify these situations.

The data set contains 80 examples of responses entered into a therapy chatbot. Each of these responses contains an id as well as an identification. The identification is either "flagged" if the response was flagged for human intervention or "not flagged" if not.

The task at hand was to create an AI agent to classify the user response.

II. Tools

The following tools and modules were used to complete this task:

- python 3.
- pandas
- dy-net (for the RNN)
- scikit learn (for the Random Forest)
- numpy
- tqdm (for progress bars)
- csv (For reading the csv embeddings to pandas)
- re (regular expressions) (for cleaning the data)

III. Preparing Data

The input data being sentences had to be cleaned up before passing into the models.

The first step was to load the csv file into a pandas dataframe and see what the data looked like. The data was, as mentioned above, a label as well as a sequence of words (not an array implementation yet). Due to the inherent nature of natural language processing both the label and sequence of words had to be converted to something which the machine could understand. That is, the label had to be converted from "flagged" or "not flagged" to 1 or 0 respectively and the sequence had to be converted to a series of word embeddings where each embedding represented a single word.

The models were created to do the conversion from label to 1 or 0 and from sentence of words to sequence of embeddings. The embeddings used were the GloVe embeddings due to their versatility, however another embedding which could have been used is the word2vec embedding

IV. Models

When looking at sentence classification, one the first thought was too look at an RNN encoder that would encode the sentence word by word and the computing a probability of being "flagged" or "not flagged". The label with the highest probability would then be applied to the sentence input.

i. RNN

V. Results

Table 1: *Example table*

Name		
First name	Last Name	Grade
John	Doe	7.5
Richard	Miles	2

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VI. Discussion

i. Subsection One

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ii. Subsection Two

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References

[Figueredo and Wolf, 2009] Figueredo, A. J. and Wolf, P. S. A. (2009). Assortative pairing and life history strategy - a cross-cultural study. *Human Nature*, 20:317–330.