Project 4

Project 4: Extending a Feature Grammar

Due date December 11, 2023

Goal: extend your feature grammar for sentiment analysis to cover more complex cases. Compare resulting sentiment analysis to a baseline system. Extend your system to identify *stance* of the movie review towards a named entity.

Data: you should be guided by examples in the NLTK data > sentence_polarity > rt-polarity.neg You may simplify data samples to focus on the topic of the assignment, as for Project 3, but for Project 4, you should attempt more complex, longer sentences.

Description: You should extend your feature grammar for NLTK's feature based Earley's Chart parser (parser class "FeatureEarleyChartParser").

You are trying to develop the best grammar you can: wider coverage, less acceptance of ungrammatical information, and trying to connect sentiment and discourse relation information.

Suggested coverage

- 1. declarative sentences with sentiment-bearing words
- 2. include relative clauses
- 3. include conjunction (and, or, but) of sentiment bearing adjectives or nouns (I saw a dull and scary movie, It was a mess and a hazard)
- 4. conjunction (and, or, but) of sentiment bearing sentences (It was too long but it was entertaining)

Data: you may continue to use the polarity dataset of Project 3 as inspiration, or you may consult the movie_reviews dataset in NLTK.

SSAP baseline: run the aFinn Simplest Sentiment Analysis in Python

- download the aFinn sentiment lexicon (https://www2.imm.dtu.dk/pubdb/views/publication_details.php?id=6010)
- get the SSAP to work (https://finnaarupnielsen.wordpress.com/2011/06/20/simplest-sentiment-analysis-in-python-with-af/)
- use your sentences for Project 3 and 4 and record the performance of SSAP
- record the performance of SSAP as a baseline and compare the performance of your Project 4 in both tabular form and with error analysis on 5 examples of different complexity

Deliverables:

Create a file *Good* with your training sentences that your grammar parses and labels correctly.

Create a file False with your training sentences that your grammar does not parse or label correctly.

- 1 file: your well-annotated grammar as a .pdf document (2pts, Grad Attr. 4,5,6)
- 1 file: Good with annotations as a ASCII document (.txt) (1pt, Grad Attr. 4,5,6)
- 1 file: False with annotations as a ASCII document (.txt) (1pt, Grad Attr. 4,5,6)
- 1 file: A report that includes:
 - one page explaining and critiquing your grammar design for complex declarative sentences (2pts, Grad Attr. 1, 6)
 - one page explaining and critiquing your grammar design for conjunction (and, or, but) of sentiment bearing adjectives or nouns (I saw a dull and scary movie, It was a mess and a hazard) with and without negation (1.5pts, Grad Attr. 1, 6)
 - one page explaining and critiquing your grammar design for conjunction (and, or, but) of sentiment bearing sentences (It was too long but entertaining) with and without negation (1.5pts, Grad Attr. 1, 6)
 - one page comparing SSAP and your grammar-based sentiment analysis of small paragraphs of text that contain sentiment words (1.5pt, Grad Attr. 1, 6)
 - one page explaining and critiquing your approach for stance assignment (1.5pts, Grad Attr. 1, 6)
 - a Demo file in .pdf format that illustrates your program running on two interesting examples (1pt, Grad Attr 1, 6)

Note on grading: if your Project 4 is better than your Project 3, it will count for both projects. Note also, that the report has to be in your words, reflecting on the indicated aspects.