

CMPS 143 - Assignment 8

1 Introduction

This homework assignment will expand upon the question answering task that you have been working on in the previous assignments. In this assignment you will use the additional information of constituency parses and dependency parses (as well as all previous information provided) to generate answers to the questions. The Input, Output, and Evaluation of your system is the same as for the last assignment and are explained in the Assignment 7 description.

2 The Task

To obtain a **passing** grade, your Q/A system should improve upon the results you achieved in HW 7 and it should use this new information to do this. It should use the **dependency parses and the constituency parses** to find the right part of the sentence that has the answer to the question. It should use WordNet API to find synonyms, hyponyms, and hypernyms for the words used in the story so that you can answer questions that mean the same things, independent of whether the words are the same. Your program should produce correctly formatted output and make a good faith attempt to answer all types of questions. Your system must conform to the provided input and output specifications.

WARNING: You will be given the answer keys for some datasets, but your Q/A system is not allowed to use them to answer questions! For example, you can not just look up the answer to each question, or use the answer keys as training data for a machine learning algorithm. Your system must answer each question using general methods and you must use exactly the same system on any test sets. The answer keys are being distributed only to show you what the correct answers are, and to allow you to score your system's performance yourself.

Note that while we are providing you with some freedom on how you implement your system, this does not mean that you can choose to make only minimum changes to your system from last week. That is, you cannot submit the same system from the last assignment again as your solution to this assignment.

3 Dataset

We have updated the files from HW7 so you MUST download the new dataset for HW8. Below is the description of the additional columns added to the new dataset,

- story file named **hw8-stories.tsv** contains **additional** columns,
 - *const_parse*: the constituency parse of each sentence in the story
 - *dep_parse*: the dependency parse of each sentence in the story
- questions file named **hw8-questions.tsv** contains **additional** columns,
 - *const_parse*: the constituency parse of the question
 - *dep_parse*: the dependency parse of the question

4 Provided Files

The new dataset is located in the `data` directory. We have also made changes to `qa_engine` framework so that it is compatible with the new dataset.

- We modified the input filenames to point to the new dataset in `qa_engine/base.py`
- We also included functions to read in the new columns described in Section 3.
- We included `chunk-demo.py` as an demo of using chunking on a story.
- We included `constituency-demo-stub.py` as a demo of using a constituency parse to find the answer to a question.
- We included `dependency-demo-stub.py` as a demo of using dependency parse to find the answer to a question.
- All previous files are still included in this upload as well. You can continue to use your existing version of the file if you want as long as you include the changes and additions we mentioned here.

File structure. Below is a listing of the files for this project as well as the file structure that is expected to run the starter code we provide for you:

```
+ data/
|   - hw8-answers.tsv
|   - hw8-questions.tsv
|   - hw8-stories.tsv
|   - hw8-stories-coref.tsv
|   - glove-w2.txt
+ qa_engine/
|   - __init__.py
|   - base.py
|   - score_sentences.py
|   - score_answers.py
+ qa.py
+ baseline-stub-wrod2vec.py
+ word2vec_extractor.py
+ chunk-demo.py
+ constituency-demo-stub.py
+ dependency-demo-stub.py
```

The command to run the Q/A system is `python3 qa.py`

5 Presentation

Presentations are Monday Dec. 2 and Wednesday Dec. 4. Your team will be randomly assigned the date and order you will be presenting in. You will be required to upload the presentation before noon the day of your presentation to this shared drive: <https://drive.google.com/drive/folders/10jjCoHcFoAoEe2HtwuCJ7vAyrosLqqzk?usp=sharing>.

For your presentation you will need to include the precision, recall and f-score of a heldout test set which we will release Sunday Dec. 1 for you to run your system on. You cannot use this heldout set to improve your results, this set should be used exclusively for testing.

6 What To Turn In

Team submission: Pick one team member to make the team submission. The team submission should be a zip file with the last names of each team member. For example, if the group members were Jane Smith and John Doe then their team submission file would be named `Smith_Doe_8.zip`. The team submission is a zip file containing the following files:

1. Your question answering system, name it `qa.py`
2. Your response file that contains the answers to all the questions for all the stories. This should be called `hw8-responses.csv`
3. README including all your team members names and any notes, if necessary, to the grader on how to run your program.
4. Include all files required to run your program.

Individual submission: Each individual should submit the following,

1. Write down who is on your team, and who is responsible for turning in the code.
2. Write a summary of what got done during this phase of the project. This should be represented by a list of tasks and how they were completed.
3. Write down your individual contribution during this phase of the project.
4. Write down the contribution of your other team members for this phase of the project.