

CMPS 143 - Assignment 8

Due Friday, June 8, 11:55 PM

1 Introduction

This homework assignment will expand upon the question answering task that you have been working on in the previous assignments. The new dataset also has new easy and medium difficulty questions for both the old and the new stories. We have also added new questions with two additional levels of difficulty: Hard and Discourse. The details of these questions difficulties are explained below. 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 be able to answer some easy, medium, and hard questions. It should use either the dependency parses or the constituency parses to find the right part of the sentence that has the answer to the question. It should use the WordNet files we have provided and the WordNet API to find synonyms, hyponyms, and hypernyms for the words used in the original story or in the Scheherazade output 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 both 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 chose 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 Using WordNet

In assignment 2, we required you to learn how to use the WordNet API for synonyms, hyponyms, and hypernyms to find other ways to say the same thing, or to find more general instances of verbs or nouns (hypernyms, *eat* is more general than *graze*) or to find more specific instances of verbs or nouns (*perched* is more specific than *sitting*).

In phase II, your work focused on increasing the precision of your system. In this last phase of the project you should try to increase both your precision and your recall. Paying attention to syntactic structures should help you increase precision, and also allow you to develop more general patterns that can answer more instances of the same type of question. You will need to use the

WordNet API and provided files in order to answer the “hard” questions.

```
QuestionID: blogs-01-19
Question: Who blasted tear gas?
Answer: The police
Difficulty: Hard
Type: Sch

...

QuestionID: blogs-01-21
Question: Who fired a chemical weapon?
Answer: The police
Difficulty: Hard
Type: Sch

...

QuestionID: mc500.train.0.23
Question: In Miami, where did Alyssa go first?
Answer: The beach
Difficulty: Discourse
Type: story

...

QuestionID: mc500.train.0.24
Question: Where did Alyssa go after the beach?
Answer: her friend Ellen's house — Ellen's house
Difficulty: Discourse
Type: story
```

Figure 1: Example questions of the new difficulty level questions for assignment 8. The answer key for story blogs-01, illustrating HARD questions. The answer key for story mc500.train.0, illustrating DISCOURSE questions.

4 Dataset

We have updated the files from HW7 so you MUST download the new dataset for HW8.

The easy questions and the medium questions are designed with different aspects of natural language processing in mind:

- **Easy:** questions that can be answered with simple string matching.
- **Medium:** questions that can be answered with constituency or dependency parses, or advanced regular expressions or string matching on the .story or .sch files.
- **Hard:** questions that rely on semantic information to interpret, in this case that means using the .dict or .csv files provided showing the words in our stories as WordNet entries, then using the NLTK WordNet API to find synonyms, hyponyms and hypernyms that can be used in questions. Some hard questions require a combination of semantic information with the use of constituency or dependency parses.

- **Discourse:** questions where inferring the correct answer requires understanding information across two sentences.

5 Provided Files

In addition to the new stories and questions, we have provided you with three new files for this assignment:

- `Wordnet_nouns.csv`
- `Wordnet_verbs.csv`
- `wordnet_demo.py` .

Two of the files are WordNet `csv` files that you can use to do Word Sense Disambiguation. The other file is a Python stub code file that shows some examples of using the information in the `csv` files.

The new dataset for assignment8 is located in the `data` directory. We have also made changes to the `qa_engine` framework so that it is compatible with the new dataset. To get started on this assignment create a new project directory that contains the `data` and `qa_engine` subdirectories. Then copy your Python files from last weeks assignment into the new project directory.

6 What To Turn In

Team submission: Pick one team member to make the team submission. 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 a file containing:

1. Team Name
2. Name of the team member who submits the main solution.
3. Describe **your team's approach** in this assignment in 1 paragraph. Each team member must write this individually.
4. Describe **your own contribution** in this assignment in 1 paragraph. Each team member must write this individually.