

1c) Is the Pacific deeper than the Atlantic?

Category:Geography

```
(ROOT
  (SQ (VBZ Is)
    (NP (DT the) (NNP Pacific))
    (NP
      (NP (JJR deeper))
      (PP (IN than)
        (NP (DT the) (NNP Atlantic))))
    (. ?)))
```

1e) Did Swank win the oscar in 2000?

Category:Movie

```
(ROOT
  (SQ (VBD Did)
    (NP (NNP Swank))
    (VP (VB win)
      (NP
        (NP (DT the) (NN oscar))
        (PP (IN in)
          (NP (CD 2000))))
      (. ?)))
```

1f) Is the Shining by Kubrik?

Category:Movie

```
(ROOT
  (SQ (VBZ Is)
    (NP (DT the) (NN Shining))
    (ADVP (RB by))
    (NP (NNP Kubrik))
    (. ?)))
```

1j) Does the album Thriller include the track BeatIt?

Category:Music

```
(ROOT
  (SQ (NNP Does)
    (NP (DT the) (NN album) (NNP Thriller))
    (VP (VB include)
      (NP (DT the) (NN track) (NN BeatIt)))
    (. ?)))
```

2a) Who directed Hugo?

Category:Movie

```
(ROOT
  (SBARQ
    (WHNP (WP Who))
    (SQ
      (VP (VBD directed)
```

```
(NP (NNP Hugo)))  
(. ?))
```

2b) Which is the scary movie by Kubrik with Nicholson?

Category:Movie

```
(ROOT  
  (SBARQ  
    (WHNP (WP Which))  
    (SQ (VBZ is)  
      (NP  
        (NP (DT the) (JJ scary) (NN movie))  
        (PP (IN by)  
          (NP  
            (NP (NNP Kubrik))  
            (PP (IN with)  
              (NP (NNP Nicholson))))))  
      (. ?)))
```

2f) In which continent does Canada lie?

Category:Geography

```
(ROOT  
  (SBARQ  
    (WHPP (IN In)  
      (WHNP (WDT which) (NN continent)))  
    (SQ (VBZ does)  
      (NP (NNP Canada))  
      (VP (VB lie)))  
    (. ?)))
```

2h) With which countries does France have a border?

Category:Geography

```
(ROOT  
  (S  
    (PP (IN With)  
      (SBAR  
        (WHNP (WDT which))  
        (S  
          (NP (NNS countries))  
          (VP (VBZ does))))  
    (NP (NNP France))  
    (VP (VBP have)  
      (NP (DT a) (NN border)))  
    (. ?)))
```

2m) Where was Gaga born?

Category:Music

```
(ROOT
  (SBARQ
    (WHADVP (WRB Where))
    (SQ (VBD was)
      (NP (NNP Gaga))
      (VP (VBN born)))
    (. ?)))
```

2n) In which album does Aura appear?

Category:Music

```
(ROOT
  (SBARQ
    (WHPP (IN In)
      (WHNP (WDT which) (NN album)))
    (SQ (VBZ does)
      (NP (NNP Aura))
      (VP (VB appear)))
    (. ?)))
```

2o) Which album by Swift was released in 2014?

Category:Music

```
(ROOT
  (SBARQ
    (WHNP
      (WHNP (WDT Which) (NN album))
      (PP (IN by)
        (NP (NNP Swift))))
    (SQ (VBD was)
      (VP (VBN released)
        (PP (IN in)
          (NP (CD 2014)))))
    (. ?)))
```

For this project, we decided to use the Stanford parser. One reason we chose the Stanford parser was because there was simple, free online demo. The user interface was extremely friendly. For the first part of the project, we could simply input the sentences and grab the parse trees within minutes. No download required, and no need to mess around with any

files. This online parser was very helpful during our last homework assignment, so we thought about giving it another shot.

For the coding requirement, since we had chosen the Stanford parser online, we decided to stick with Stanford to keep things uniform such as parsing and POS tagging. Another main reason we had chosen Stanford was because we were both familiar with Java. That narrowed down our choices to just Stanford and OpenNLP, so we just had to pick one. We didn't test OpenNLP, but once we used Stanford, we enjoyed it. Stanford also seemed to have some tools that we could probably use, such as named entity recognition, so it made sense to pick Stanford. In addition to this, the Stanford Parser has a tool called Name Entity Recognizer (NER) that labels words based on that word being a Location, Person, or Organization. NER was able to help us make more accurate guesses and narrow down our choices between two categories. For our approach we created a tuple that held the label of every word, and we attempted to use those labels to find words that were not in our word bank and categorize them accordingly. Such as a question asking "Where is Paris?" Because it has a location and begins with Where we are able to return Geography. If this fails we have as our last resort a word bank that can only appear in a certain category, such as oscar only appearing in movies, and song only appearing in questions in the Music category.