



CS224N: Natural Language Processing
Spring 2008
Weekly Quiz

Quiz 5

1: With a computer reading this sentence, you have just observed an example of:

- Malapropism
- Garden pathing
- Coordination ambiguity
- All of the above

2: To do relation analysis between entities, one approach is to use seed patterns such as

/[PER] who worked at [ORG]/

to collect information of all the companies/organizations that people have worked for. This type of approach is referred to as:

- Unsupervised learning
- Lightly supervised learning
- Supervised learning
- None of the above

3: Which of the following is true about top-down and/or bottom-up parsing?

- Bottom-up parsing has an advantage over top-down parsing in that conflicting rules are impossible.
- Top-down parsing can be inefficient as it spends considerable time exploring trees that are not consistent with the input words.
- Bottom-up parsing may generate subtrees that cannot eventually derive the start symbol.
- A & B
- B & C
- A, B, & C

4: In the PA3 handout is given this equation for computing the derivatives of the objective function:

$$\frac{\partial F(\vec{\lambda})}{\partial \lambda_i} = -1 \cdot \left[\underbrace{\left[\sum_{\langle c,d \rangle \in \langle C,D \rangle} f_i(c,d) \right]}_{\text{actual count}} - \underbrace{\left[\sum_{\langle c,d \rangle \in \langle C,D \rangle} \sum_{c'} p(c' | \dots) \right]}_{\text{predicted count}} \right]$$

What is true about this equation?

- Both "count" terms require knowledge of the true class labels.
- The feature index i does not specify a class: this is accomplished by the c or c' argument.
- The negative sign outside was introduced because we are minimizing our likelihood objective.
- None of the above

5: There are two different views of linguistic structures: phrase structure and dependency structure. Given an arbitrary dependency structure, when is it possible to represent it as a tree:

- Always, in general.
- Only when there are no local or attachment ambiguities.
- Only when the dependency structure has no crossed edges.
- Both conditions B & C

6: One way to design a top-down parser for the following grammar, say:

S -> NP VP
 NP -> AT NN
 NN -> cat
 ...

is to write the functions parseS(), parseNP(), parseNN(), etc., then start a parse simply by calling parseS(). Knowing this, which of the following grammar rules would be illegal in a top-down parser:

- NP -> NP NN
- VP -> VBZ S
- S -> NP VP S
- AT -> the | a (here the "|" means an "or", so the two rules "AT -> the" and "AT -> a")

7: Say we use the seed pattern

/[PER] worked at [ORG]/

to discover the relations of people and the companies they have worked at, as in the fragment, "Thompson worked at Google." Then, when this seed pattern matches the sentence, "All summer Timmy worked at his desk," this is an example of:

- Hapax legoma
- Solecism
- Bootstrapping
- Semantic drift
- Lexical ambiguity

8: There are many ways to derive a single confidence value from a set of multiple confidence measures. Which of the methods given below is most designed to disregard low-confidence readings.

a) $conf(t) = 1 - \prod_p 1 - conf(p)$

b) $conf(t) = \prod_p conf(p)$

c) $conf(t) = \frac{\sum_p conf(p)}{\sum_p 1}$

d) $conf(t) = 1 - \max \left| conf(p) - \frac{\sum_p conf(p)}{\sum_p 1} \right|$

- A
- B
- C
- D