

CSE 250B Quiz 3

Tuesday January 28, 2014

Instructions. Do this quiz in partnership with exactly one other student. Write both your names at the top of this page. **Circle one name that we will call out when we return the quiz. Choose a first name or last name that is likely to be unique in the class.**

Discuss the answer to the question with each other, and then write your joint answer below the question. Use the back of the page if necessary. It is fine if you overhear what other students say, because you still need to decide if they are right or wrong. You have seven minutes. The maximum score is three points.

Question. For a linear chain CRF, a low-level feature function has the form $f_j(\bar{x}, i, y_{i-1}, y_i)$. Typically, these feature functions are defined via a template such as $f_j(\bar{x}, i, y_{i-1}, y_i) = A_a(\bar{x}) \cdot B_b(y_{i-1}, y_i)$, where a ranges over a set \mathcal{A} and b ranges over a set \mathcal{B} . Consider the task of predicting punctuation for a sentence, as in the current assignment. For this task, suggest a collection of A_a functions and a collection of B_b functions that are useful together. Specify clearly the membership of the sets \mathcal{A} and \mathcal{B} . Explain your suggestion briefly.

Answer. This question is open-ended, so there are many possible answers. Here is one example.

Suggestion: Let each B_b function be $B_b(y_{i-1} = b_1 \text{ and } y_i = b_2)$ where $b = (b_1, b_2)$ and b_1 and b_2 range over all punctuation symbols. Let each A_a function be $A_a(\bar{x}) = I(x_{i-1} = a)$ where a ranges over all function words such as prepositions, conjunctions, articles, and personal pronouns.

Explanation: This family of feature functions allows the CRF to model the probability of each specific pair of punctuation symbols surrounding each specific function word. Examples of function words are “the” “but” “above” and “she.”