CS378 Midterm Topics

For the midterm, **you will be allowed one 8.5x11 note sheet**. We may also choose to print critical formulas on the exam if these are necessary for a question. Below is the list of topics that will be covered on the midterm, which is the bulk of the course material up to and including March 7, with the exclusion of CRFs.

- Naive Bayes: model, estimation from data (including smoothing), computing posterior probabilities

- Bag-of-words features: how these feature spaces look and how they work for classification

- Perceptron (binary classification)

- Logistic regression (binary classification)

- Sentiment analysis

- Multiclass classification: how weights and features work in this setting

- Multiclass perceptron: definition and training

- Feedforward neural networks

- Training neural networks

- Word embeddings: CBOW, skip-gram, skip-gram with negative sampling

- POS tagging

- Hidden Markov Models

- Viterbi algorithm

- Beam search

- PCFGs: definition, estimation, grammar refinement

- CKY algorithm

- Shift-reduce dependency parsing (arc-standard system)

Other content   You should expect to see examples of text and be comfortable reasoning about how these algorithms might work on such examples, as in the assignments so far. We won't expect you to know things like part-of-speech definitions or have encyclopedic knowledge of grammar structures—we will provide the necessary information for such questions.

Readings   We won't expect you to know content from the Eisenstein book that hasn't been covered in lecture. As for the other assigned readings, we may ask questions pertaining to concepts from these (concepts being at the level discussed in lecture), but we generally won't assume that you've committed the specific approaches to memory.

Practice problems   The book's problems are generally a bit more theoretical and challenging than we would have for an exam. We will try to release some practice problems soon. The following book exercises are reasonable review problems that cover concepts from lecture: Chapter 3 Ex 2, Chapter 4 Ex 1, Chapter 7 Ex 1, Chapter 9 Exs 8 and 9, Chapter 10 Ex 4, Chapter 11 Ex 1, Chapter 14 Exs 4 and 5.