CS 228T QUIZ 8

1. Briefly describe the main differences between a standard SVM and a structural SVM.

2. What is the point of 'slack rescaling' and 'margin rescaling'? What are some differences between these two formulations?

3. What is the main idea behind the algorithm presented to train (standard) structural SVMs? Specifically, how does it address the fact that the primal problem has exponentially many constraints?

4. How do we incorporate latent variables into the structural SVM framework?

5. This question reviews some basic material about subgradients and subdifferentials.

(a) What is the difference between a subgradient and the subdifferential of a function at a point?

(b) Let f be a convex function. Explain how to find a global lower bound to f at an arbitrary point $x \in \mathbf{dom}\, f$ (such that the bound is tight at x).

(c) Let $f(x) = (1 - x)_+$, where $x \in \mathbb{R}$ and $(z)_+ = \max(0, z)$. What are $\partial f(0)$, $\partial f(1)$, and $\partial f(2)$?

(d) Let $f(x) = \max_{i=1,\dots,m} f_i(x)$, where the functions f_i are subdifferentiable, $i.e.$, f is a pointwise maximum of subdifferentiable functions. What is $\partial f(x)$?