CS 6780: Advanced Machine Learning **(Submitted on: 3/6/2019)**

Submission Assignment #2

Instructor: Thorsten Joachims *Name:* Molly Ingram, Julien Neves, *Netid:* msi34, jmn252

Problem 1

(a)
(b)

Problem 2

(a)
(b)
(c)

Problem 3

(a) The batch algorithm we are minimizing is

$$F(\mathbf{w_i}) = \sum_{j=1}^{n} \max(0, -y_j(\mathbf{w_i} \cdot \mathbf{x_j}))$$

The global minimum, 0, is achieved when all n data points are classified correctly, i.e. $y_j(\mathbf{w_i} \cdot x_j) \geq 0$.

So the gradient is $\nabla_{\mathbf{w}} F(\mathbf{w_i}) = \sum_{j \in E} y_j \mathbf{x_j}$ where E is the set of all misclassified data points ($y_j(\mathbf{w_i} \cdot x_j) \leq 0$)

(b)

(c)

(d)

(e)