COS 598A, Spring 2012
Homework #5 notes

Corrections:

6.5: The formula for η_t is incorrect, and should instead be:

$$\eta_t \doteq \max\left\{0, \ln\left(\frac{(1-u)\ell_t}{u(1-\ell_t)}\right)\right\}.$$

Hints:

5.9(c): Start by proving the stated inequality conditional on $\mathbf{w}$ being chosen so that $\mathbf{w} \cdot \mathbf{w}^* \geq 0$. Then use this fact to obtain the same result without such conditioning (possibly with a different constant).

Also, you might find Markov's inequality useful, which states that, for any nonnegative real-valued random variable X, and for any constant $c > 0$, $\mathbf{Pr}[X \geq c] \leq (\mathbf{E}[X])/c$.

6.6: Create an online learning algorithm that makes its predictions on each round using a (deterministic) weighted majority vote of the classifiers in $\mathcal{H}$.

6.9(d): Use the fact that $\mathbf{M} = -\mathbf{M}^\top$. Also, when computing the value of $\mathbf{M}$, consider $P^\top \mathbf{M} P$, for any distribution P.