HW3 LiChen Liang

1. a) $x = \frac{x'-c}{a}$ $\quad w^T\left(\frac{x'-c}{a}\right)+b = \frac{w^T x'}{a} - \frac{w^T c}{a} + b$

$w' = \frac{w^T x'}{a}$ $\quad b' = b - \frac{w^T c}{a}$

b) $w' = \frac{w^T x'}{A}$ $\quad b' = b - \frac{w^T c}{A}$

c) If A is invertible, then it means we can still find the decision boundary by rotating to find A^{-1}. If A is non-invertible, ie. A^{-1} is non existent, if we reduce the dimension then we are not able to find the decision boundary.

2. a) When assuming each base classifier is independent with accuracy $> 50\%$, ensemble methods will improve accuracy

b) Missclassified instance will cause a higher error rate. To reduce error rate, we should increase it's weight α in each iteration

c) Yes, by overfitting.