Electrical and Computer Engineering **Dr. Mohamed N. Ahmed**
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ECE620: Hw # 4

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1. Class ω_1 has data points {1, 2, 3} while {-5, -3, -2} belong to class ω_2.
   a) What are the augmented vectors?
   b) Show the solution region in the weight space.
   c) Starting with zero initial weights and using single sample perceptron algorithm, obtain a linear discriminant function that separates the two classes. Let $\eta = 1$.

2. Suppose we have the following two-dimensional points for categories ω_1: $\begin{bmatrix} 0 \\ 2 \end{bmatrix}$, $\begin{bmatrix} 2 \\ 0 \end{bmatrix}$ and $\begin{bmatrix} 3 \\ 1 \end{bmatrix}$, $\begin{bmatrix} 2 \\ 4 \end{bmatrix}$ for class ω_2. Construct a linear classifier by matrix pseudoinverse.