

Given the following two-dimensional points and their actual labels:

$$\mathbf{x}_A = \begin{pmatrix} 0 \\ 1 \end{pmatrix}, \quad y_A = 0$$

$$\mathbf{x}_B = \begin{pmatrix} 1 \\ 1 \end{pmatrix}, \quad y_B = 0$$

$$\mathbf{x}_C = \begin{pmatrix} 3 \\ 3 \end{pmatrix}, \quad y_C = 1$$

$$\mathbf{x}_D = \begin{pmatrix} 4 \\ 3 \end{pmatrix}, \quad y_D = 1$$

If we initial the vector of weights for each dimension (including w_0) as

$$\tilde{\mathbf{w}} = \begin{pmatrix} -5 \\ 2 \\ 1 \end{pmatrix}. \text{ What's the vector of weights using Logistic Regression Model after only}$$

one iteration by gradient decent (the learning rate $\eta = 0.1$)?