ECE-GY 6143 Machine Learning HW 06

Tongda Xu

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1. Question 2:
   a. $\{x \in R^2 | 1 + 2x_1 + 3x_2 < 0\}$
   b. $\{x \in R^2 | 1 + 2x_1 + 3x_2 > -lg\frac{1}{4}\}$
   c. $\{x_1 \in R | 1 + 2x_1 + \frac{3}{2} > -lg\frac{1}{4}\}$

2. Question 3:
   a.
   b. $z_i = x_2, w, b = \{0, 1, 0\}$
   c. $\{30, 0, 0\}$
   d. No, no change
   $\hat{y_i}$ only depends on whether $z_i > o$, scale this with α, the value persist. Think this in a geometry way, the function of the hpyter-plan in homogeneous coordinate persist as $(x, 1)$ and $(x, \frac{1}{\alpha})$

3. Question 4:
   a. $z = -6 + 0.05 * 40 + 3.5 = -0.5$
   $P(y = 1|x, \beta) = \frac{1}{1+e^{0.5}} = 0.38$
   b. $e^{-z} = 1, \rightarrow z = 0$
   $-6 + 0.05 * 50 + 3.5 = 0$
   he need to study 50 hours

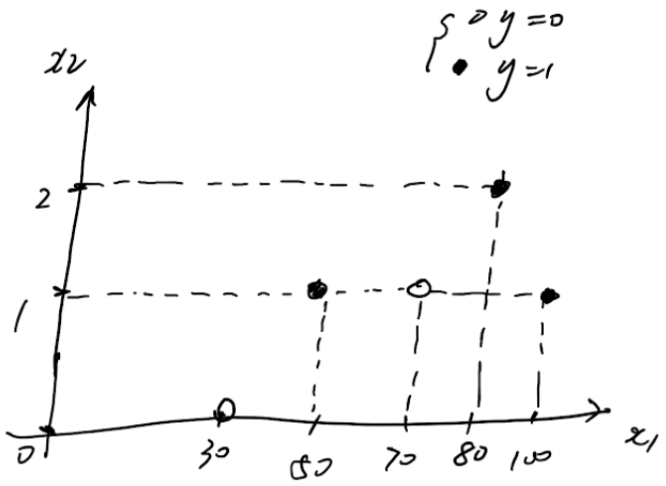

Figure 1: 3.a